DO SECURITY ANALYSTS SPEAK IN TWO TONGUES?[*]

ULRIKE MALMENDIER
STANFORD UNIVERSITY

DEVIN SHANTHIKUMAR
HARVARD UNIVERSITY

Why do analysts display overoptimism about the stocks they cover? According to the selection hypothesis, analysts are truly too optimistic about the stocks they choose to cover. According to the conflict-of-interest hypothesis, analysts choose to distort their view to maximize profits via commissions and underwriting business, in particular if affiliated with an underwriting bank. We analyze the concurrent issuance of recommendations and earnings forecasts to differentiate between these two hypotheses. The selection hypothesis implies a positive correlation between overoptimism in recommendations and in forecasts. Under the conflict-of-interest hypothesis, analysts may choose to distort recommendations but to prove their analyst quality in their forecasts, which are directed towards more sophisticated, institutional investors. We find that, while affiliated analysts' recommendations are more optimistic than unaffiliated recommendations, affiliated analysts' earnings forecasts are more pessimistic than unaffiliated forecasts. Similar discrepancies between the timing and persistence of recommendations and forecasts confirm this interpretation. Additional results on trading reactions indicate that small traders react indeed more strongly to recommendations, while large traders discount recommendations and react more strongly to analyst earnings forecasts.

[*] Michael Jung provided excellent research assistance.

I. INTRODUCTION

Why do security analysts issue overly positive recommendations? A large literature in finance and accounting, building on Lin and McNichols (1998) and Michaely and Womack (1999), provides evidence on distortions in analyst recommendations, in particular if the analyst's investment bank has an underwriting relationship with the covered firm. It is less transparent why these distortions occur. Do analysts consciously bias recommendations upwards to generate trading business and commissions, and to please clients whose securities their bank underwrites? Or is their view truly too positive, consistent with their decision to cover those firms in the first place and reinforced by their bank's decision to underwrite securities of those firms? To understand the cause of analyst overoptimism is especially important in light of the debate about optimal analyst regulation. If analyst overoptimism is due to selection and unconscious upward bias, the optimal policy would provide support to help analysts overcome the "winner's curse" rather than attempting to prove conscious distortion and implement punishments. If overoptimism is the result of misaligned incentives, the opposite is true and, in addition, there is room for restricting or moderating coverage by affiliated analysts.

In this paper we provide empirical evidence that allows distinguishing between the selection and the moral hazard hypotheses. We exploit that security analysts provide information using different modes of communication. One way analysts issue their opinion on a firm is stock recommendations. Another way is earnings forecasts. While recommendations typically target individual investors, forecasts are directed towards the more sophisticated, institutional investor. We show that the degree of overoptimism between recommendations and earnings forecasts is positively correlated for unaffiliated analysts but not for affiliated analysts. This inconsistency of affiliated analysts and additional results on the timing and persistence of recommendations and forecasts indicate that affiliated analysts make the strategic choice to distort recommendations, but not forecasts.

The question why analysts issue overly positive information arises since analysts face a well-known conflict of interests. On the one hand, they have incentives to issue precise information to satisfy customers and earn trading commissions from long-term customer relationships. On the other hand, they may distort this information upward to generate trading commissions from stock purchases[1] or to ease access to information from the management of the recommended firm.[2] The incentives to bias recommendations upward are even stronger for "affiliated" analysts, whose brokerage belongs to an investment bank underwriting security issuances of the firms covered by the analyst. Positive analyst coverage after an equity issuance is often viewed as part of an implicit agreement between underwriter and issuer and to be helpful in generating future underwriting business.[3] Moreover, analysts' compensation depends, either directly or indirectly, on their "support" in generating profits for the corporate finance department.[4] For all of those reasons, it is conceivable that analysts' overoptimism reflects strategic distortion rather than selection.

While this conflict of interest is well analyzed in the previous literature, there has been less focus on the question how the heterogeneity of investors affects the equilibrium behavior of analysts. Analysts may not choose a uniform degree of distortion (if any) for all types of investors, but rather bias information targeting one type of investor and be more accurate towards another type. The reason is that the upside of distortion is smaller the more sophisticated the investor is: A sophisticated investor is likely to detect the distortion. This is particularly true for institutional investors who have their own buy-side analysts. Moreover, the relative benefits of proving to be a high-quality analyst are larger the larger the trades of the customer. Therefore, to the extent that strategic distortion explains analyst optimism, its degree should vary between information primarily consumed by individual investors, who may take analyst information at face value, and information targeting more sophisticated, institutional investors. If, instead, the

[1] Positive recommendations are more likely to generate trading commissions than negative ones because of short-selling constraints.

[2] Report on Analysts Conflicts of Interest, International Organization of Securities Commissions [2003].

[3] Michaely and Womack [1999].

[4] Michaely and Womack [2003]; Hong and Kubik [2003].

overoptimism reflected the true beliefs of analysts, we would expect optimistic analysts to express their positive view also towards sophisticated investors.

In addition to the effect of heterogeneity in the degree of sophistication, the explanatory power of selection may also vary across analysts, reflecting heterogeneity in incentives. The stronger the incentives to distort information, the more likely it is that selection is not the sole cause of overoptimism and that, therefore, the degree of overoptimism varies between different types of information release.

We exploit this argument empirically in a synopsis of recommendations and earnings forecasts of affiliated and unaffiliated analysts. As shown in Malmendier and Shanthikumar (2004), stock recommendations issued by analysts have more immediate impact on the portfolio allocation decisions of individual (small) investors. The simple "buy" or "sell" message is accessible to any investors, regardless of the degree of sophistication. The same may not hold for earnings forecast. The stock price impact of a given dollar amount of earnings may be more accessible to institutional investors and their buy-side analysts. As a result, recommendations and earnings forecasts may differ in their degree of upward distortion. If the overoptimism, displayed in recommendations, reflects conscious upward distortion, analysts may moderate their view as expressed in earnings forecasts. While distorting the information primarily consumed by individual (and less sophisticated) investors they may want to prove their skills and insights to institutional (and more sophisticated) investors in the information issued targeting institutions. If the overoptimism is, instead, due to selection and reflects truly positive views, recommendation optimism and forecast optimism should be positively correlated. Finally, note that the correlation may vary between affiliated and unaffiliated analysts. Since affiliated analysts face stronger incentives to distort, recommendations and forecasts may differ more.

We test these two alternative predictions empirically using the I/B/E/S data on recommendations and one-year earnings forecasts. We first show that, while recommendations of affiliated analysts are more optimistic than those of unaffiliated analysts, the same does not

hold for earnings forecasts. Rather, the average earnings forecast of affiliated analysts is lower than that of unaffiliated analysts and the distribution displays less variance.

As a first indication that these discrepancies may reflect a strategic distortion decision, we show that affiliated analysts tend to update recommendations much faster upwards than downwards. Unaffiliated analysts, instead, do not display a significant difference in their updating decision. Affiliated analysts issue their – on average overly positive – recommendations only if the consensus is very high. They then simply stick to positive recommendations as long as possible without deviating too much from the overall recommendation consensus. For forecasts, however, the results are different. The timing of forecast updates of affiliated and unaffiliated analysts is virtually identical. Regardless of affiliation, analysts appear to incorporate new information at a similar speed. These findings suggest that recommendation updates are, compared to earnings forecast updates, more of a strategic choice than a mere reflection of news about the company.

The key argument in this paper relies on the relationship of recommendations and forecasts to the consensus. We find that affiliation of any form has strong predictive power for overoptimism in recommendations, but that the same is not true for forecasts. Affiliation instead is related to more negative deviation from the consensus earnings forecast. In fact, we also find that forecast optimism is negatively correlated with recommendation optimism for affiliated analysts' annual earnings forecasts, while there is an insignificant positive correlation for unaffiliated analysts, with the difference between affiliated and unaffiliated analysts being significant.

These results suggest that affiliated analysts make a conscious decision to distort recommendations, with which they target small investors, and to display no overoptimism in their earnings forecasts, with which they target large investors. As a last step in the analysis we show that recommendations have, indeed, most impact on the trading decisions of small investors, while forecasts affect the trading decisions of large, institutional investors. Following previous market microstructure literature [Lee and Radhakrishna, 2000], we distinguish between

small (individual) and large (institutional) investors based on the size of their trades. Using trading data from the New York Stock Exchange Trades and Quotations (TAQ) database (1993-2002), we find distinctly different patterns of trade reactions to recommendations and to earnings forecasts among large and small investors. In their trade reaction to recommendations, large investors generally discount the positive content but they distinguish between affiliated and unaffiliated recommendations. Specifically, they discount recommendations of affiliated analysts more than those of unaffiliated analysts. Small investors, instead, take analyst recommendations literally: they buy in response to buy recommendations, hold in response to hold recommendations, and sell in response to sell recommendations. Moreover, small investors do not distinguish between recommendations of affiliated and unaffiliated analysts. The trade reactions to earnings forecasts look rather different. Large investors react much more strongly to earnings forecasts of affiliated analysts than to those of unaffiliated analysts. Not only is the statistical significance of large traders' reaction to earnings forecasts much higher for affiliated forecasts, but it also economically much stronger. The trade reaction to affiliated forecasts is about 64 times as strong. The trade reaction of small investors, instead, is not significant, neither for forecasts of affiliated nor for those of unaffiliated analysts.

We interpret our findings as evidence that affiliated analysts communicate to different types of investors "in different tongues." While they exaggerate the prospects of covered firms towards individual investors, they abstain from such distortions towards more sophisticated institutional investors. As a result, these dual modes of communication make analysts and large traders better off: Since the costs of distortion are larger vis-à-vis sophisticated investors, large investors receive more accurate information than small investors, and analysts profit from small investors trade reaction to overly positive recommendations while maintaining their reputation with institutional investors. Small investors, instead, are worse off compared to a world with only one type of information release. Were analysts restricted to recommendations, those would likely be less distorted. And were analysts restricted to forecasts, small investors may not be able to interpret them and not follow analysts at all, which may still make them better off. Our

findings cast doubt on the effectiveness of regulation requiring analysts simply to reveal information to all investors simultaneously. Our findings suggest that only part of the communicated information will be processed by all investors. The findings of this paper are likely to extend to other market settings in which informed agents are allowed to communicate in different modes of complexity, e.g. issue both a detailed and complicated report and also give out the punch line.

This paper relates to the evidence in Lin and McNichols [1998] and Michaely and Womack [1999] that stock recommendations by affiliated analysts are more favorable but perform more poorly over short (three-day) and long (up to two-year) horizons. Iskoz [2002] confirms these results for strong buy recommendations and provides evidence that institutional investors may be accounting for the distortions of affiliated analysts, as far as one can deduce from the quarterly changes in institutional ownership. In Malmendier and Shanthikumar [2004], we provide evidence that small investors naively follow recommendations while larger traders account for analyst bias. Ottaviani and Squintani [2004] analyze a cheap-talk model in which the receiver may be naive and believes that the sender is honest, leading to too much communication and biased equilibrium allocation. The behavioral-finance literature on investor reaction to firms' accounting choices, issuance decisions, and repurchase offers provides evidence of such naiveté.[5] Investors appear to be "credulous" and not to discount enough for the incentives of firms to manipulate the signal. The question of whether selection or conflict of interest explains analyst overoptimism is partially analyzed in McNichols and O'Brien [1997], Lin, McNichols and O'Brien [2003] and Kolasinski and Kothari [2004]. Finally, our paper relates to the market microstructure literature on trading reactions. We employ the modified Lee and Ready [1991] algorithm to classify trades as buyer- or seller-initiated [following Odders-White 2000] and measure trade reaction as in Lee [1992], Hvidkjaer [2001], and Shanthikumar [2003].

The remainder of the paper is organized as follows. Section 2 describes the research question and research design. Section 3 provides details on the various sources of data employed

[5] For an overview see Daniel, Hirshleifer, and Teoh [2002], esp. pp. 177 ff.

in this study. In Section 4, we present the empirical results on distortions in analyst recommendations and the lack of distortions in earnings forecasts and on the trade reaction of small and large investors. Section 5 concludes.

II. Empirical Strategy

1. Analyst Behavior

Analysts may issue upward-biased stock recommendations for two reasons. The first explanation is selection. Security analysts typically have quite a bit of say in the decision of which stocks they cover, at least beyond the largest cap stocks. They are likely to choose companies whose investment prospects they judge favorably, hoping that those are of most interest to their buy-side clients. In addition, it is simply more exciting and motivating for an analyst to research a company where he or she sees great potential. If analysts do not account for the endogenous selection, their recommendations will be affected by winner's curse and will be too positive on average. Similarly, the corporate finance division may be affected by winner's curse. The investment bank's decision to finance a particular company implies a fundamentally positive view on that company – maybe more positive than warranted by the company's performance. It is conceivable that the positive view of the corporate finance division reinforces or triggers a similar view on the side of the analyst. Similarly, it is possible that the more positive view of the analyst encourages the corporate finance division to seek out underwriting business with the given firm. In either direction of causality, the winner's curse is likely to be strongest for the analysts with an underwriting affiliation.

The second explanation is misaligned incentives. One reason analysts may bias their recommendations upwards is that buy recommendations are more likely to generate trading business than sell recommendations. A buy recommendation can induce any investor to buy a stock; a sell recommendation, however, is mostly relevant for current owners of the stocks, given the short-selling constraints investors face. In addition, analysts are exposed to pressure from the

management of the company they are covering. In order to ensure increases in shareholder value of their company, management often calls up analysts and complains about ratings that are "too low" and even tends to "freeze out" analysts who do not give positive recommendations.[6] Similarly, buy-side clients may push sell-side analysts to maintain positive recommendations on stocks they hold.[7]

Analysts have additional reasons to distort recommendations upward if their brokerage firm is part of an investment bank that is underwriting security issuances. Favorable recommendations are generally viewed as a precondition for investment banks to get future underwriting deals and as an implicit condition of existing underwriting contracts.[8] Analysts whose brokerage firm is associated with an investment bank are likely to be exposed to pressure (and monetary incentives) from corporate finance departments to support underwriting business with positive recommendations. As a result, analysts weigh the advantages of maintaining reputational capital to provide reliable security analyses against the incentive to generate portfolio transactions and, in the case of affiliation with an investment bank, the incentive to support underwriting business.

Analysts have, however, more than one mode of communicating their view of a company. In particular, while stock recommendations are consumed mostly by individual investors, earnings forecasts are most relevant for institutional – and as such typically more sophisticated – investors. As a result, the optimal distortion may vary between recommendations and earnings forecasts. Since sophisticated investors are more likely than individual investors to detect upward bias, the upside of distorting is more limited for earnings forecasts than for recommendations. In addition, institutional investors play a larger role in evaluating analysts, for example through the high profile annual "All-Star Analyst" list of Institutional Investor Magazine. Thus the potential costs to damaged reputation is more severe with institutional

[6] For details on management communication with analysts see Francis, Hanna and Philbrick [1997].

[7] Boni and Womack [2002] cite several press reports and the testimony of the (then) acting SEC chairman Laura Unger to the House Subcommittee on July 31, 2001.

[8] See Bradley, Jordan, and Ritter [2003].

investors than with individual investors. Consistent with this argument, Mikhail, Walther and Willis (1999) provide evidence that relative earnings forecast accuracy affects analyst turnover while returns to stock recommendations do not.

In order to distinguish between the selection and the conflict-of-interest explanation for analyst overoptimism we distinguish between two scenarios. Suppose first that recommendations are not subject to strategic distortion, i. e. that it is more important for analysts to build reputational capital via reliable recommendations, even towards individual investors, and that any overoptimism is merely a result of selection. Then the same has to hold for earnings forecasts. Given the heightened risk of detection, it is even more important for analysts to give accurate earnings forecasts. In that case, any upward bias in recommendations, reflecting the analyst's true overoptimism about a firm and its future cash flows, should be positively correlated with upward bias in earnings forecasts. Suppose now that, instead, the benefits of strategic distortion are large enough to affect recommendations. In that case, earnings forecasts do not need to be affected by the distortion. Again, given the heightened risk of detection by sophisticated investors, analysts may choose to rather build up a reputation as knowledgeable and accurate. As a result, overoptimism in recommendations may have no or even negative correlation with overoptimism in forecasts. A negative correlation could, for example, result if affiliated analysts attempt to please the management for which they have cautious earnings forecasts by being particularly bullish in their recommendations. More generally, if recommendation bias is due to strategic distortion, the reduction in positive correlation or the negative correlation is likely to be strongest for affiliated analysts, given that they face the largest incentives to distort.

2. Empirical measures

In order to distinguish the above hypotheses empirically, we need to employ measures of distortion both for recommendations and for earnings forecasts as well as empirical proxies for the sophistication of investors. In addition, in order to confirm that analysts address individual

investors with recommendations and institutional investors with forecasts, we have to employ an algorithm to measure individual and institutional trade reaction.

Distortion benchmarks. Our proxies for distortion are based on the difference between an analysts' forecast or recommendation and the existing analyst consensus at the time. For annual (quarterly) earnings forecasts, the consensus calculation is based on all forecasts made during the applicable year (quarter), following the prior annual (quarterly) earnings announcement. For example, if an annual earnings announcement is expected to be made in February of 2000, we would include all earnings forecasts made following the February 1999 earnings announcement. For any given firm on any given day, we then use the most recent earnings forecast from each analyst for that firm and define the consensus as the average of these outstanding forecasts. The calculation of the recommendation consensus is similar. The key difference is that recommendations do not apply to any specific time period. We thus calculate four variations of the consensus, using 1 month, 2 months, 6 months and 12 months of prior recommendations.

The "distortion" or optimism/pessimism of the analyst is then measured as the difference between the earnings forecast or recommendation and the relevant consensus. Since earnings forecasts are measured in earnings-per-share, i.e. in dollars and cents, the difference is normalized. We use two alternate normalizations. Corresponding to the earnings-per-share measure, one normalization is price-per-share. "Distortion" is measured as the difference between earnings forecast and consensus, normalized by share price on the date of the earnings forecast. The alternate normalization is to divide the difference between earnings forecast and consensus by the absolute value of consensus, creating a percentage measure. The difference between recommendation and consensus is not normalized, since the scale is identical for all firms.

Affiliation. Our empirical measures of analyst affiliation are based on the underwriting relationship of the analyst's brokerage house with the firm the analyst is reporting on. Following

previous literature,[9] we identify analysts as affiliated if their investment bank was the lead underwriter of an initial public offering (IPO) of the recommended stock in the past five years or of a secondary equity offering (SEO) in the past two years. We also include co-underwriters over the same respective periods. We further examine two possible sources of underwriting bias that have not been explored in the previous literature. The first source is future affiliation, i.e. banks underwriting an SEO in the next one or two years. There are several potential sources of incentives for future underwriters to issue higher recommendations, including attempts to gain the future business, pressure to increase the potential offer price of the future security offering and winner's curse. The number of additional firms we capture with this measure is small, though, since most future underwriters are in previous underwriting relationships. A second type of affiliation that has not been examined previously is bond underwriting, in particular lead underwriting of bonds in the past year. If positive coverage is part of an implicit agreement between underwriter and equity issuer, then there is no obvious reason this should be different for bond issuance.

Investor type. We separate small and large investors by trading size. Following the analysis of Lee and Radhakrishna [2000], we choose dollar cutoffs rather than share-based cutoffs in order to minimize noise in separating individuals from institutions. We also incorporate their suggestion to use two cutoffs, with a buffer zone between small and large trades. Specifically we choose the cutoffs based on results for three-month TORQ sample from 1990-91, in which actual information on the identity of traders was available to check the accuracy of the trade-size based classification method. The lower cutoff of $20,000 splits small and medium trades, and the higher cutoff of $50,000 splits medium and large trades.[10]

Trade Reaction. To capture the reaction of small and large investors to analyst recommendations, we employ measures of "directional trade" (trade initiation). These measures,

[9] Lin and McNichols [1998]; Michaely and Womack [1999].

[10] The results are robust to variations in cutoff; see Panel B of Table IX.

first developed by Lee and Ready [1991], are market microstructure algorithms that aim at capturing the buy and sell pressure exerted by traders. They exploit the fact that most trades take place when one side of the transaction demands immediate execution. Accordingly, trades are classified as "buyer-initiated" if the buyer demands immediate execution and as "seller-initiated" if the seller demands immediate execution. An abnormally high balance of buyer-initiated trades indicates buy pressure; an abnormally high balance of seller-initiated trades indicates sell pressure. In general, the side of a trade demanding faster execution represents a market order, i.e. an order to be executed immediately at the current market price. For example, investors who have received positive information about a firm and who believe that the stock price will rise would not place a limit order to buy. That limit order might never be filled. Instead, they would place a market order, and demand to buy immediately – before the price goes up further.

We use the modified version of the Lee and Ready [1991] algorithm, developed in Odders-White [2000], to determine which side initiated the trade. The algorithm matches a trade to the most recent quote that precedes the trade by at least 5 seconds. If a price is nearer the bid price it is classified as seller initiated, and if it is closer to the ask price it is classified as buyer initiated. If a trade is at the midpoint of the bid-ask spread, it is classified based on a "tick test. The tick test categorizes a trade as buyer-initiated if the trade occurs at a price higher than the price of the previous trade (uptick), and as seller-initiated if the trade is on a downtick. We drop trades at the bid-ask midpoint, which are also the same price as in preceding trades.[11]

As a proxy of buy pressure, we will consider three measures. The net number of buy-initiated trades for firm *i*, investor type *x*, and date *t* is defined as

$$NB_{i,x,t} = buys_{i,x,t} - sells_{i,x,t} \quad (1)$$

The raw trade imbalance measure for firm *i*, investor type *x*, and date *t* is calculated as

[11] The original Lee-Ready algorithm employs a "zero-tick" in the case that a trade is at the bid-ask midpoint and the same price as the previous trade. Because of its low accuracy (about 60% according to Odders-White, 2000) the "zero-tick" is left out in the modified Lee-Ready algorithm.

(2) $$TI_{i,x,t} = \frac{buys_{i,x,t} - sells_{i,x,t}}{buys_{i,x,t} + sells_{i,x,t}}$$

Finally, we normalize this measure by subtracting off the firm-year mean, and dividing by the firm-year standard deviation, separately for each investor type, as in Shanthikumar [2003]:

(3) $$TI^{abnormal}_{i,x,t} = \frac{TI_{i,x,t} - \overline{TI}_{i,x,year(t)}}{SD(TI_{i,x,year(t)})}$$

The adjustments are made by year to account for changes in trading behavior over time. We also adjust by firm because the trading behavior for various firms may have consistent differences. These normalizations allows us to compare trading behavior over time and among firms and replaces year- and firm-fixed effects in the regression framework. Dividing by the standard deviation controls for systematic differences in the volatility of large trades and small trades or in the volatility of the stocks large and small traders invest in. It makes comparisons between small and large investors possible and rules out that a seemingly more extreme reaction is just the result of higher volatility in trade imbalances over time.

III. Data

We analyze four main sources of data: data on analyst recommendations, data on analyst earnings forecasts, data on underwriting activity, and data on securities trading.

We obtain analyst recommendations and earnings forecasts and information about the analyst identities and brokerage firms from I/B/E/S. The recommendations data are available starting from October 29, 1993, so we use this as our sample period start date.[12] I/B/E/S converts

[12] Note that the I/B/E/S data contains an unusually high number of recommendations and forecasts during the first three months of the sample period. While the number of recommendations per year – and even per month – is fairly uniform during the period from February 1994 through 2001, the first two months and three days contain a multiple of observations. While this may have to do with large

the recommendation formats of different brokerage houses into one uniform numerical format. Like other authors [Jegadeesh, Kim, Krische and Lee, 2004], we reverse the original I/B/E/S coding to the following, more intuitive scheme: 5=strong buy, 4=buy, 3=hold, 2=sell, 1=strong. A "higher" recommendation is better, and an "upgrade" translates into a positive change in the numerical value.

I/B/E/S reports earnings forecasts in earnings-per-share (EPS), and includes the realization of earnings reported by the company at the end of the period. Since earnings can be reported in many different ways, for example including extraordinary items or leaving them out of the calculation, I/B/E/S communicates with analysts in an attempt to ensure that each earnings forecast includes similar items, and the announced value reported in I/B/E/S coincides with the given definition of earnings. I/B/E/S also adjusts the reported forecasts and announcement values for stock splits, and we use the split-adjusted values. We focus on earnings forecasts of the next annual earnings figure. We eliminate observations relating to earnings announcements which occur outside of the SEC mandated reporting window of 0-90 days after the end of the fiscal year. We include earnings forecasts which occur between the prior earnings announcement date and the date of the earnings announcement to which the forecast relates. For most of our analyses, we limit the forecast sample to those forecasts with an identified analyst, but this eliminates less than two percent of the forecasts, eliminating 6,713 forecasts of the 471,985 forecasts meeting the timing requirements.

I/B/E/S reports recommendations and earnings forecasts in separate files, with slightly different notations. In order to match an analysts' buy/sell recommendation with the same analysts' earnings forecast, we use the analyst identity files corresponding to each dataset. The

---

layoffs in the securities industry during that time, it also leaves room for concerns about data consistency within the I/B/E/S sample. Due to the potential "scandal effects" from 2001 and 2002 and the reporting anomalies in the I/B/E/S data set for the early period, we repeat our tests for a sample from February 1994 through July 2001, containing 2252 securities and 2229 firms.

recommendations database uses the "amaskcd" variable and the forecast database uses the "analyst" variable as numeric analyst identification codes, which then map to names. The IBES documentation is not clear about whether these two numeric variables correspond, so to ensure a proper match, we used the analyst identity files and a combination of programmed name-matching and hand-matching to ensure a perfect match, and confirm that the two numeric codes do in fact coincide.

We use the SDC New Issues database to obtain underwriting data from 1987 to 2002. We link I/B/E/S broker firms and SDC underwriters with the company names provided by the I/B/E/S recommendation broker identification file and the SDC database. We improve the match using company websites and news articles, in particular to determine subsidiary relationships and corporate name changes. Finally, we use the mapping from Kolasinski and Kothari [2004] to identify additional matches.[13]

The raw trading data is collected from the New York Stock Exchange Trades and Quotations database (TAQ). The TAQ database reports every round-lot trade and every quote from January 1, 1993 onwards on the New York Stock Exchange, American Stock Exchange and NASDAQ. We examine ordinary common shares traded on the NYSE, excluding certificates and depository receipts. We also exclude foreign companies, Americus trust components, closed-end fund shares and REITs. The final trading sample includes 2801 securities for 2723 firms, as defined by 8-digit and 6-digit CUSIPs, respectively.

We obtain security prices, returns, and share information from CRSP, and financial variables of the companies from COMPUSTAT. The cleaned[14] and merged data set extends from October 29, 1993 through December 31, 2002 (with underwriting data from 1987 on), and contains 173,950 recommendations and with linked trading data, for 2424 securities of 2397

[13] We are very grateful to Adam Kolasinski and S.P. Kothari for providing us with their mapping, which uses corporate websites, news articles from LexisNexis, Hoover's Online, and the Directory of Corporate Affiliations to refine the matches.

[14] We drop miscoding such as Berkshire Hathaways, where the extremely high share price exceeds the number of digits available in the COMPUSTAT data set.

firms. Notice that only 12% of the firms in our NYSE sample lack recommendations, so that our final sample contains almost the entire set of domestic NYSE firms with common stock.

IV. Empirical Analysis

1. Analyst Recommendations and Earnings Forecasts

Table I shows sample statistics for the recommendations in the merged dataset. In Panel A, we display the distribution of recommendations across categories both for the full set of analysts and for affiliated analysts, further subdivided by the type of underwriting relationship. Strikingly, the vast majority of recommendations fall into the top three categories, "hold", "buy" and "strong buy." Fewer than 5% of all recommendations are "sell" or "strong sell." The recommendations are even more positive for analysts whose brokerage house has an underwriting relationship with the covered firm. The proportion of "buy" and "strong buy" recommendations is higher for analysts with an underwriting relationship, and the proportion of "sell" and "strong sell" is even lower than for the unaffiliated analysts. The upward shift in recommendations is most pronounced for future equity underwriting, and least pronounced for bond underwriting, but is present for all five categories we examine. Analysts whose brokerage houses do not underwrite any security issuance during the 1987-2002 period have the least positive recommendations and the most sell and strong sell recommendations.

In Panel B, we display the distribution for the subsample of firms that have issued stock in an SEO during the past 2 years or an IPO during the past 5 years, or that have issued bonds during the past one year. Examining the recommendations of affiliated and unaffiliated analysts on this subsample allows us to investigate whether the (additional) upward shift in recommendations of affiliated analysts is simply due to better prospects of firms that access the capital market for external financing. We find that this is not the case. As in the full sample in Panel A, there is a clear upward shift in recommendations when an analyst has an underwriting relationship, also within the subsample of firms that *can* have affiliated analysts.

In the remainder of this paper, we analyze why this occurs. Is the upward shift due to incentive conflicts or moral hazard? Or, alternatively, is the upward shift could due to self-selection? In order to separate whether analysts are genuinely more optimistic about companies with which their brokerage firm has an underwriting relationship or whether the shift is due to analyst incentives, we present a synopsis of at earnings forecasts as well.

Table II shows similar statistics for forecasts of annual earnings-per-share, pertaining to the announcement following the earnings forecast date. The average earning forecast is $1.67 per share, and the earnings forecasts tend to be positive in general, with even the 25th percentile being $0.78. This is consistent with the predominance of non-negative earnings announcements. In sharp contrast to the recommendations, the earnings forecasts are actually lower for affiliated analysts than for unaffiliated analysts, with the exception of bond underwriting affiliated analysts. The earnings forecasts are lowest for IPO and SEO lead underwriters and future SEO underwriters. In fact, the mean earnings forecast of affiliated analysts is significantly lower for all categories other than bond underwriting. (The difference is also significant for all categories of affiliated analysts considered together, including bond underwriters.) Moreover, the distribution of earnings forecast of affiliated analysts displays less variance.

As shown in Panel B, these patterns also hold when the sample is limited to recent security issuers. The results regarding future SEO underwriters are particularly noteworthy. If analysts of future underwriting firms were overly optimistic about the firms, we would expect them to have higher earnings forecasts. Similarly, if they were using positive earnings forecasts to try and win underwriting business, we would expect higher earnings forecasts. Instead we see the reverse, suggesting both that analysts are not overly optimistic and that they are not using earnings forecasts to entice potential investment banking clients.

Table III shows similar statistics for forecasts of quarterly earnings-per-share, pertaining to the announcement following the earnings forecast date. As with annual earnings, equity-underwriting affiliated analysts issue significantly lower earnings-per-share forecasts than unaffiliated analysts. The earnings forecasts are in general positive, at levels which are roughly

one quarter of the annual earnings-per-share forecasts. The earnings forecasts are significantly higher for bond-underwriting affiliated analysts than for unaffiliated analysts, but for IPO and SEO lead and co-underwriters, and for future SEO underwriters, the earnings forecasts are significantly lower than for unaffiliated analysts. Panel B again shows the statistics for the sample limited to recent security issuers, and shows that unaffiliated earnings forecasts are actually significantly higher for these firms than other firms. This makes the difference between affiliated and unaffiliated analysts' quarterly earnings-per-share forecasts even stronger.

In order to further pin down "distortions" in the recommendations of affiliated analysts, we consider the timing of the different types of recommendations and earnings forecasts. It is conceivable that part of the upward bias is due to quicker reactions of affiliated analysts to news about the company. They may issue a "strong buy" as soon as they receive indications of future growth prospects, even if they have to revise it soon after. We find, however, that affiliated analysts update their recommendations more slowly, waiting 50 more days on average, and that this difference is entirely driven by positive recommendations (Table IV, Panel A). While affiliated analysts are faster to update negative and hold recommendations, they preserve their positive recommendations about 70 days more than unaffiliated analysts. A similar picture emerges if we divide recommendations into upgrades and downgrades as shown in the lower portion of Panel A. Affiliated analysts wait about two and a half months longer than unaffiliated analysts before downgrading a stock. (The regression analysis in Panel B shows that he differences in timing are significant.)

Note the difference in the speed of upgrading and downgrading in itself is consistent with both the selection and the moral-hazard explanation. If affiliated analysts truly have an overly optimistic view of the company they cover, they will also put more weight on positive news, which are consistent with their prior, than on negative news. If affiliated analysts strategically distort recommendations, they may stick to positive recommendations longer than to negative ones. This updating strategy is useful to "hide in the crowd": rather than deviating visibly from the recommendations of unaffiliated analysts they simply do not adjust to negative information

as fast as unaffiliated analysts, and they are instead particularly fast to adjust to positive information. However, if the selection argument applies, we would expect similar differences in the persistence of earnings forecasts.

Table V displays similar statistics for the timing of annual earnings forecasts and Table VI displays similar statistics for the timing of quarterly earnings forecasts. While there is a significant difference between affiliated analysts' recommendation timing and unaffiliated analysts' recommendation timing, we do not find a significant difference for earnings forecasts. Affiliated analysts update forecasts which are equal to the consensus more quickly than unaffiliated analysts, but update forecasts below the consensus or above the consensus at almost exactly the same speed as unaffiliated analysts, for both their annual and quarterly earnings forecasts. In contrast to the recommendations, which affiliated analysts issue less frequently than unaffiliated analysts, the forecast frequency is almost identical for affiliated and unaffiliated analysts. The key difference occurs for annual earnings forecasts which are followed by an earnings-per-share estimate decrease, and in this case affiliated analysts do hold the forecast longer than unaffiliated analysts. While this does point to some shift in the incorporation of negative information, the results are still in sharp contrast to recommendations behavior, which shows a drastic shift in timing using virtually every measure.

While the lack of a difference in the forecast updating behavior of affiliated and unaffiliated is striking, the different nature of annual earnings forecast certainly plays some role. In particular, companies release earnings news every quarter. Analysts may feel compelled to react to these news in a timely manner. However, this does not rule out significantly different updating behavior of affiliated and unaffiliated analysts, and there is no similar regular news item to force quarterly forecast updating. In particular, for both quarterly and annual earnings forecasts, affiliated analysts could well exploit more of the 90-day interval between quarterly announcements. Thus the discrepancy between the updating decision in the case of recommendations and in the case of earnings forecasts gives some first indication that analysts may strategically choose to bias recommendations upwards.

While the recommendation timing differences (and the lack thereof for earnings forecasts) indicate that affiliated analysts incorporate negative news into their recommendations systematically more slowly than positive news, the results do not imply that affiliated analysts stand out in always being the first to increase their recommendation after positive news. We thus compare the recommendations of the different analyst groups to the average recommendation over the preceding one to 12 months (Table VII, Panel A). We restrict the sample to those firms with recent stock or bond issuances, to reduce the impact of any heterogeneity in the stocks that "affiliated" and "unaffiliated" analysts cover. Over a one or two-month horizon the recommendations of any type of affiliated analyst typically lie significantly above the consensus while the recommendations of "never affiliated" analysts are always significantly lower than the consensus. The effect gets weaker for IPO lead-underwriters and equity co-underwriters the longer backwards the consensus is constructed. This implies that affiliated analysts tend to issue their generally positive recommendations when the consensus is gradually declining. However, conditional on a level of recommendation, affiliated analysts are deviating less from the current consensus than unaffiliated analysts (Panel B). In other words, affiliated analysts issue their positive recommendations when the consensus is high – in fact, when the consensus is higher than the level at which unaffiliated analysts issue positive recommendations. In other words, affiliated analysts issue positive recommendations when other analysts are issuing positive recommendations as well, but then maintain these recommendations significantly longer than unaffiliated analysts. These additional results confirm that affiliated analysts are "hard to detect in the crowd." Rather than identifying the optimistic view when other analysts are more cautious, they wait until the majority view is positive before they increase their rating, and then simply do not downgrade as fast as their unaffiliated colleagues.

Tables VIII and IX display a similar analysis for annual and quarterly earnings forecasts respectively. Here we compare earnings forecasts to the existing consensus. We again limit the sample to recent stock or bond issuers to ensure that affiliation is possible for all the included stocks. The regression results show that IPO lead-, SEO lead- and equity co-underwriters issue

forecasts that are significantly lower than the consensus. Using both measures of earnings forecast optimism, SEO lead underwriters and equity co-underwriters are significantly more pessimistic than unaffiliated analysts, while we have seen that their recommendations are significantly more optimistic. For IPO lead underwriters the results are slightly less clear, with insignificant coefficients for quarterly earnings forecasts. But even for this group, the contrast between earnings forecast and recommendation behavior is sharp – with zero or negative differences on earnings forecasts and significantly positive differences on recommendations.

Both of the recommendation and the forecast comparison to the consensus are hard to reconcile with the selection story, as we would expect these analysts to have a more positive view of the firm than other analysts, and thus issue higher earnings forecasts, if there was an underwriting winner's curse.

The most immediate test of the two explanations for positive recommendations is a direct comparison of recommendation optimism and earnings forecast optimism. It appears that recommendations are more optimistic when an analyst has an underwriting affiliation with a covered firm, while earnings forecasts are more pessimistic. In order to test whether the same analyst who is issuing a more positive recommendation abstains from issuing a more positive earnings forecast, we directly link the recommendations and forecasts made by a given analyst. We compare the "optimism" of the forecasts and recommendations measured by the difference between the recommendation or forecast and the existing consensus variables at the time of the earnings forecast.

The results are reported in Table X. The sample is limited to earnings forecasts which occur between 15 and 70 days before the relevant earnings announcement, to exclude earnings forecasts which are most likely to be subject to adverse incentives, those just before ore just after an earnings announcement. The sample is also limited to recent issuers, as above. Panel A displays the relationship between recommendations and annual earnings forecasts. We find that for unaffiliated analysts there is roughly a zero relation between forecast optimism and recommendation optimism, with a positive but insignificant coefficient estimate. In contrast, for

affiliated analysts there is a significantly negative coefficient for the regression of forecast optimism on recommendation optimism. A negative relation means that the more positive an affiliated analysts' recommendation, the more negative his earnings forecast will be. In addition, the difference between the unaffiliated and affiliated analyst relations is statistically significant, with the relation going from insignificantly positive to significantly negative. Particularly given that the intercept estimates are virtually identical for the two groups, this implies that affiliated analysts will issue lower earnings forecasts for the same recommendation level. This evidence points strongly towards the "incentive conflict" explanation of affiliated analysts' recommendations rather than the "winner's curse" story. With the "winner's curse" story, we would expect optimism in both forecasts and recommendations for the affiliated analysts, or at least independence between the two. An explicit negative relationship suggests that the different incentives described in section II.1 are influencing the two issuances. Panel B displays the relationship between recommendations and quarterly earnings forecasts. For unaffiliated analysts, there is a significantly positive relationship between forecast and recommendation optimism, while there is an insignificant negative coefficient for affiliated analysts. The difference between the two slope coefficients is marginally significant, at the 10% level. There is a strong significant difference between the intercepts for the two groups of analysts in addition. The intercept is significantly more negative for affiliated analysts than unaffiliated analysts, so while they are not explicitly issuing more positive recommendations and more negative earnings forecasts together, they are issuing more negative forecasts in general, independent of their recommendation levels. Both the annual and quarterly earnings forecast results show a significant difference between how affiliated and unaffiliated analysts issue directly related earnings forecasts and buy/sell recommendations.

2. Trade Reaction

As the final piece of our analysis, we explore which type of investors reacts to which type of information issued by security analysts. In particular, we would like to test whether small, individual investors and large, institutional investors display no significant difference in their

reaction to recommendations and forecasts, or whether in fact small investors react to recommendations but less to earnings forecasts. If this were the case then analysts maybe indeed be able to satisfy their clients demand to issue more positive predictions about the firm through the recommendations, while maintaining their reputations with more sophisticated investors through their earnings forecasts.

We examine trade reactions to both buy/sell recommendations and earnings forecasts. Table XI displays sample statistics for the buying and selling patterns of small and large traders. Panel A displays statistics for the full trading sample, for all stocks in our recommendations and forecast samples, while Panel B shows statistics for recommendation event days, and Panel C reports statistics for earnings forecast event days. Small traders tend to make more traders than large traders, making over twice as many on a standard day. The gap is smallest on earnings forecast dates when small traders make only 50% more trades than large traders. Both trade-size groups increase their buying and their selling on recommendations and earnings forecast event days, with both the number of trades and the dollar value traded increasing in both groups.

Table XII displays trading reactions to buy/sell recommendations and Table XIII reports trading reactions to earnings forecasts. Table XII, Panel A, shows that small investors react more positively to analyst buy/sell recommendations than large traders do. Replicating the results of Malmendier and Shanthikumar (2004), we find that large investors discount recommendations while small investors follow them literally. For example, large investors have a negative reaction to a hold recommendation, the reaction of small investors is not significantly different from zero. Small investors react as strongly to a buy recommendation as large investors do to a strong buy, and small investors react over twice as positively to a strong buy as large traders. In addition, large traders shift recommendations downwards when an analyst is affiliated, to the point that large traders have a slightly negative coefficient on affiliated strong buy recommendations. In contrast, small traders make almost no adjustment if the analyst is affiliated. In additional regressions (not reported), we find that small investors react significantly more strongly to buy/sell recommendations even when if we control for prior recommendations, possible front-

running, analyst firm-size and various other factors are considered. Panel B shows a regression format that is more comparable to the one we use for earnings forecasts. Both small and large traders exhibit significantly positive slope coefficients – indicating that they do buy more when a buy/sell recommendation level is higher. Small traders exhibit a significantly higher sensitivity to the level of recommendation for affiliated recommendations than for unaffiliated recommendations. Small traders also have higher intercepts for both groups than large traders, buying more regardless of the level of recommendation.

Table XIII reports reactions of both small and large traders to earnings forecasts made by affiliated and unaffiliated analysts, and the results are again very different. Panel A displays results for annual earnings forecasts. Large traders react significantly positively to annual earnings forecast revisions made by both unaffiliated and affiliated analysts, with a statistically significantly more positive reaction to affiliated analysts than to unaffiliated analysts. Moreover, we observe a huge difference in economic significance. Large investors react about 64 times as strongly to forecasts of affiliated analysts than to those of unaffiliated analysts. In contrast, small traders display no significant reaction to earnings forecasts made by unaffiliated analysts. The estimated coefficient for small trade reaction to affiliated analysts is negative, although it is not statistically significant. Panel B displays a similar analysis of quarterly earnings forecasts. Large traders react significantly positively to quarterly earnings forecast revisions by unaffiliated analysts. While their reaction to affiliated analysts is not significantly positive, the coefficient estimate is slightly higher than for unaffiliated analysts. In contrast, the estimated coefficients for small trade reaction are negative.

These results show that in general, large traders react much more strongly to earnings forecasts than small traders do, and that large traders react even more strongly to annual earnings forecasts made by affiliated analysts. Both sets of results support the idea that analysts target large traders with their earnings forecasts and small traders with their buy/sell recommendations.

V. Conclusion

In this paper, we provide evidence on the cause of optimism bias in analyst recommendations. We show that affiliated analysts issue more positive recommendations on average but do not display the same optimism in their forecasts. Rather, optimism in recommendations and optimism in annual earnings forecasts appear to be negatively correlated for affiliated analysts. For unaffiliated analysts, however, we find a positive correlation between these two types of upward bias. Our findings suggest that affiliated analysts strategically choose to display recommendation optimism towards small investors, while they abstain from doing so towards large investors. The trade reaction of small and large investors is consistent with this hypothesis. Large investors strongly react to earnings forecasts, in particular those of affiliated analysts, while they discount recommendations. The opposite is true for small investors. While unaffiliated analysts, who display overoptimism in their recommendations, may thus be expressing their truly overoptimistic view, affiliated analysts appear to react to incentive misalignment towards investors.

Our findings also have implications for the policy debate about the appropriate regulations to be imposed on brokerage houses. Our results suggest that the question is not how to "help" affiliated analysts overcome winner's curse, but rather how to ensure that they abstain from strategic distortion.

The problem analyzed in this paper may have more general applicability. Broadly speaking, it is one example where allowing an informed agent to communicate "in different tongues," i. e. using more or less complex language, with uninformed but heterogeneous agents may harm the less sophisticated among them. To the extend that policy makers would like to ensure that the decision-making of less sophisticated investors is, if not informed, at least not based on misleading information, they may want to restrict differentiated information transmission of financial intermediaries.

References

Boni, Leslie and Kent L. Womack, "Solving the Sell-Side Research Problem: Insights from Buy-Side Professionals," *Working Paper,* (2002).

Hong, Harrison and Jeffrey D. Kubik, "Analyzing the analysts: Career concerns and biased earnings forecasts," *Journal of Finance*, LVIII, (2003), 313-351.

Hvidkjaer, Soeren, "A Trade-based Analysis of Momentum," *mimeo*, (2001).

International Organization of Securities Commissions, Report of the IOSCO Technical Committee on Analysts Conflicts of Interest, September 2003.

Iskoz, Sergey, "Relative Performance and Institutional Reaction to Underwriter Analyst Recommendations," *Working Paper*, (2002).

Kolasinski, Adam and S.P. Kothari, "Analyst Objectivity and Investment Banking Relationships: Evidence on Analysts Affiliated with M&A Advisors." *MIT Working Paper*, (2004).

Lee, Charles M. C., "Earnings News and Small Traders: An Intraday Analysis," *Journal of Accounting and Economics*, XV, (1992), 265-302.

Lee, Charles M. C., and Balkrishna Radhakrishna, "Inferring Investor Behavior: Evidence from TORQ Data," *Journal of Financial Markets*, III, (2000), 83-111.

Lee, Charles M. C., and Mark J. Ready, "Inferring Trade Directions from Intraday Data," *Journal of Finance*, XLVI, (1991), 733-746.

Lin, Hsiou-wei and Maureen F. McNichols, "Underwriting Relationships, Analysts' Earnings Forecasts and Investment Recommendations," *Journal of Accounting and Economics*, XXV, (1998), 101-127.

Lin, Hsiou-wei, McNichols, Maureen F. and Patricia C. O'Brien, "Analyst Impartiality and Investment Banking Relationships," *Working Paper*, 2003.

McNichols, Maureen F. and Patricia C. O'Brien "Self-Selection and Analyst Coverage," *Journal of Accounting Research*, XXXV, (1997), 167-199.

Malmendier, Ulrike and Devin Shanthikumar, "Are Investors Naïve about Incentives?" NBER Working Paper 10812, (2004).

Michaely, Roni and Kent L. Womack, "Conflict of Interest and the Credibility of Underwriter Analyst Recommendations," *Review of Financial Studies*, XII, (1999), 653-686.

_____ and _____, “Brokerage Recommendations: Stylized Characteristics, Market Responses, and Biases,” in Richard Thaler, ed., *Advances in Behavioral Finance II*, forthcoming (2003).

Mikhael, Michael B., Beverly R. Walther, Richard H. Willis, “Does Forecast Accuracy Matter to Security Analysts?,” *The Accounting Review*, LXXIV, (1999), 185-200.

Morgan, John and Phillip Stocken, “An Analysis of Stock Recommendations,” *Journal of Economics*, XXXIV, (2003), 183-203.

Odders-White, Elizabeth R, “On the Occurrence and Consequences of Inaccurate Trade Classification,” *Journal of Financial Markets*, III, (2000), 259-286.

Ottaviani, Marco and Francesco Squintani, “Non-Fully Strategic Information Transmission,” *Working Paper,* (2004).

Schotter, Andrew, “Decision Making in the Face of Naive Advice,” *American Economic Review, Papers & Proceedings*, (2003).

Shanthikumar, Devin, Small Trader Reactions to Consecutive Earnings Surprises, *Working Paper* (2003).

TABLE I. Sample of Recommendations

Panel A: Entire Sample	Sample size	Percentage by category					Numerical translation[1]	
		Strong Sell	Sell	Hold	Buy	Strong Buy	Mean	Standard Deviation
All	121,130	1.72	2.86	36.84	32.90	25.67	3.78	0.92
Unaffiliated	110,113	1.82	2.95	37.75	32.27	25.22	3.76	0.92
Affiliated	8,466	0.73	1.61	25.68	39.56	32.42	4.01	0.84
IPO lead-underwriting (past 5 years)	1,104	0.63	1.45	23.82	38.41	35.69	4.07	0.84
SEO lead-underwriting (past 2 years)	1,198	0.42	1.50	21.87	39.90	36.31	4.10	0.82
Co-underwriting equity[2]	4,143	0.99	1.62	26.43	38.79	32.17	4.00	0.86
Future SEO (next 2 years)	665	0.00	0.30	14.29	45.56	39.85	4.25	0.70
Bond lead underwriting (past year)	2,083	0.62	1.87	27.99	39.85	29.67	3.96	0.84
Never Affiliated[3]	6,418	3.91	4.25	36.63	28.01	27.19	3.70	1.04

Panel B: Subsample of firms with an IPO in the past 5 years, an SEO in the past 2 years or a bond issue in the past year	Sample size	Percentage by category					Numerical translation[1]	
		Strong Sell	Sell	Hold	Buy	Strong Buy	Mean	Standard Deviation
All	54,952	1.55	2.47	34.99	33.73	27.24	3.83	0.91
Unaffiliated	45,523	1.71	2.59	36.70	32.58	26.42	3.79	0.92
Affiliated[4]	8,237	0.75	1.65	25.88	39.43	32.28	4.01	0.85

Sample period is 10/29/1993 to 12/31/2002.

[1] The numerical translation scheme is 1=strong sell, 2=sell, 3=hold, 4=buy, 5=strong buy.

[2] We exclude co-underwriters who are also lead underwriters of SEO or IPO issuances to eliminate the large number of double-counts in this particular category.

[3] A brokerage firm is "Never Affiliated" if it does not have any (lead or co-underwriter) equity or bond underwriting affiliation during the entire sample period.

[4] "Affiliated" summarizes the same categories as in Panel A (IPO in the past 5 years, SEO in the past 2 years, IPO/SEO co-underwriting over the same horizons, future underwriting in the next 2 years, and bond underwriting in the next year).

TABLE II. Sample of Annual Earnings Forecasts

Earnings Forecasts are reported in dollar earnings-per-share. The sample is limited to forecasts pertaining to the closest following annual earnings-per-share announcement, and to earnings announcements which occur during the SEC mandated window of 0-90 days after the end of the relevant fiscal year.

Panel A: Entire Sample						Percentile		
	Sample size	Mean	Std. Dev.	Minimum	Maximum	25th	50th	75th
All	471,931	1.67	1.73	-45.05	30.00	0.78	1.41	2.25
Unaffiliated	459,063	1.67	1.73	-45.05	30.00	0.78	1.41	2.25
Affiliated	10,315	1.58	1.80	-10.85	29.50	0.70	1.25	2.08
IPO lead-underwriting (past 5 years)	967	1.15	1.10	-5.15	6.60	0.57	1.04	1.62
SEO lead-underwriting (past 2 years)	1,316	1.29	1.13	-2.10	7.20	0.60	1.17	1.72
Co-underwriting equity[1]	5,706	1.41	1.96	-10.85	29.50	0.60	1.10	1.80
Future SEO (next 2 years)	792	1.23	1.03	-4.40	5.35	0.58	1.15	1.75
Bond lead underwriting (past year)	2,406	2.31	1.71	-6.85	10.40	1.11	1.98	3.23
Never Affiliated[2]	187,812	1.71	1.76	-40.00	30.00	0.79	1.45	2.30

Panel B: Subsample of firms with an IPO in the past 5 years, an SEO in the past 2 years or a bond issue in the past year						Percentile		
	Sample size	Mean	Std. Dev.	Minimum	Maximum	25.00	50.00	75.00
All	205,254	1.77	1.68	-15.90	30.00	0.80	1.48	2.42
Unaffiliated	194,110	1.78	1.67	-15.90	30.00	0.80	1.49	2.45
Affiliated[3]	10,027	1.58	1.82	-10.85	29.50	0.69	1.25	2.10

Sample period is 10/29/1993 to 12/31/2002.

[1] We exclude co-underwriters who are also lead underwriters of SEO or IPO issuances to eliminate the large number of double-counts in this particular category.

[2] A brokerage firm is "Never Affiliated" if it does not have any (lead or co-underwriter) equity or bond underwriting affiliation during the entire sample period.

TABLE III. Sample of Quarterly Earnings Forecasts

Earnings Forecasts are reported in dollar earnings-per-share. The sample is limited to forecasts pertaining to the closest following quarterly earnings-per-share announcement, and to earnings announcements which occur during the window of 0-50 days after the end of the relevant fiscal quarter. The SEC mandated window is 0-45 days.

Panel A: Entire Sample						Percentile		
	Sample size	Mean	Std. Dev.	Minimum	Maximum	25th	50th	75th
All	426,478	0.40	0.49	-62.50	15.00	0.17	0.34	0.57
Unaffiliated	417,384	0.40	0.49	-62.50	15.00	0.17	0.34	0.57
Affiliated	9,094	0.40	0.46	-5.01	7.00	0.15	0.32	0.56
IPO lead-underwriting (past 5 years)	723	0.28	0.33	-1.81	1.33	0.12	0.25	0.43
SEO lead-underwriting (past 2 years)	1,237	0.33	0.30	-0.98	2.05	0.15	0.30	0.46
Co-underwriting equity[1]	4,631	0.34	0.48	-5.01	7.00	0.12	0.28	0.46
Future SEO (next 2 years)	773	0.32	0.31	-1.40	1.55	0.14	0.27	0.50
Bond lead underwriting (past year)	2,517	0.57	0.47	-1.44	3.15	0.26	0.51	0.78
Never Affiliated[2]	162,592	0.41	0.51	-62.50	8.17	0.17	0.35	0.58

Panel B: Subsample of firms with an IPO in the past 5 years, an SEO in the past 2 years or a bond issue in the past year						Percentile		
	Sample size	Mean	Std. Dev.	Minimum	Maximum	25.00	50.00	75.00
All	186,596	0.43	0.46	-8.00	15.00	0.19	0.37	0.62
Unaffiliated	177,812	0.44	0.46	-8.00	15.00	0.19	0.37	0.62
Affiliated[3]	8,784	0.40	0.46	-5.01	7.00	0.15	0.32	0.56

Sample period is 10/29/1993 to 12/31/2002.

[1] We exclude co-underwriters who are also lead underwriters of SEO or IPO issuances to eliminate the large number of double-counts in this particular category.

[2] A brokerage firm is "Never Affiliated" if it does not have any (lead or co-underwriter) equity or bond underwriting affiliation during the entire sample period.

[3] "Affiliated" summarizes the same categories as in Panel A (IPO in the past 5 years, SEO in the past 2 years, IPO/SEO co-underwriting over the same horizons, future underwriting in the next 2 years, and bond underwriting in the next year).

TABLE IV. Persistence of Recommendations

Panel A. Sample Statistics

	Mean (median) number of days until new recommendation (same stock, same analyst)					
	Overall	Strong Sell	Sell	Hold	Buy	Strong Buy
Unaffiliated	307.9	186.1	181.4	323.4	292.7	331.9
	(181)	(98)	(103)	(180)	(176)	(207)
Affiliated (IPO, SEO, co-underwriters)	357.2	103.2	90.9	296.1	360.7	403.3
	(228)	(57)	(59)	(182)	(230)	(272)

	Mean (median) number of days until new recommendation (same stock, same analyst)	
	Before Upgrade	Before Downgrade
Unaffiliated	297.2	316.8
	(162)	(193)
Affiliated (IPO, SEO, co-underwriters)	301.6	390.8
	(178)	(259)

Sample Period is 10/29/1993 to 12/31/2002.

Panel B. OLS Regression

All independent variables are binary. Excludes recommendations which are reiterations of the prior recommendation. Sample Period is 10/29/1993 to 12/31/2002. Standard errors in parentheses.

	Days until new recommendation (same stock, same analyst)			
	(1)		(2)	
(Strong Sell, Sell, Hold)	292.1	(2.2)	292.1	(2.2)
(Buy)	270.9	(2.3)	271.1	(2.3)
(Strong Buy)	308.2	(2.6)	308.2	(2.6)
(Strong Sell, Sell, Hold)* (Any Affiliation)	-33.9	(12.3)		
(Strong Sell, Sell, Hold)* (IPO Affiliation)			-17.5	(31.4)
(Strong Sell, Sell, Hold)* (SEO Affiliation)			-6.7	(29.8)
(Strong Sell, Sell, Hold)* (Co-Affiliation)			-43.3	(14.7)
(Buy)* (Any Affiliation)	50.4	(9.4)		
(Buy)* (IPO Affiliation)			26.1	(22.1)
(Buy)* (SEO Affiliation)			89.6	(21.6)
(Buy)* (Co-Affiliation)			39.5	(11.3)
(Strong Buy)* (Any Affiliation)	33.7	(10.3)		
(Strong Buy)* (IPO Affiliation)			65.8	(23.0)
(Strong Buy)* (SEO Affiliation)			49.1	(24.4)
(Strong Buy)* (Co-Affiliation)			17.6	(12.6)
Number of Observations	66,403		66,403	
R^2	0.4184		0.4185	

TABLE V. Persistence of Annual Earnings Forecasts

Panel A. Sample Statistics

	Mean (median) number of days until new recommendation			
		Relative to Consensus		
	Overall	Less than	Equal to	Greater than
Unaffiliated	63.1	59.6	89.1	65.1
	(54)	(49)	(76)	(56)
Affiliated (IPO, SEO, co-underwriters)	64.1	59.1	87.2	66.6
	(55)	(49)	(74)	(59)

	Mean (median) number of days until new forecast (same	
	Before Increase	Before Decrease
Unaffiliated	64.4	62.0
	(56)	(51)
Affiliated (IPO, SEO, co-underwriters)	64.0	64.3
	(57)	(54)

Sample Period is 10/29/1993 to 12/31/2002.

Panel B. OLS Regression

All independent variables are binary. Excludes forecasts which are reiterations of the prior

	Days until new forecast (same stock, same analyst)			
	(1)		(2)	
Greater than Consensus	65.1	(0.1)	65.1	(0.1)
Equal to Consensus	89.1	(0.5)	89.0	(0.5)
Less than Consensus	59.6	(0.1)	59.6	(0.1)
(Greater than Consensus)* (Any Affiliation)	1.4	(1.0)		
(Greater than Consensus)* (IPO Affiliation)			4.8	(3.0)
(Greater than Consensus)* (SEO Affiliation)			-3.7	(2.5)
(Greater than Consensus)* (Co-Affiliation)			2.2	(1.2)
(Equal to Consensus)* (Any Affiliation)	-1.8	(2.7)		
(Equal to Consensus)* (IPO Affiliation)			7.8	(5.7)
(Equal to Consensus)* (SEO Affiliation)			-0.1	(6.7)
(Equal to Consensus)* (Co-Affiliation)			-4.2	(3.3)
(Less than Consensus)* (Any Affiliation)	-0.5	(1.0)		
(Less than Consensus)* (IPO Affiliation)			0.0	(3.1)
(Less than Consensus)* (SEO Affiliation)			0.0	(2.4)
(Less than Consensus)* (Co-Affiliation)			-0.9	(1.1)
Number of Observations	317,628		317,628	
R^2	0.6309		0.6309	

TABLE VI. Persistence of Quarterly Earnings Forecasts

Panel A. Sample Statistics

	Mean (median) number of days until new recommendation (same			
		Relative to Consensus		
	Overall	Less than	Equal to	Greater than
Unaffiliated	39.48	38.34	44.54	39.15
	(38.0)	(36.0)	(47.0)	(37.0)
Affiliated (IPO, SEO, co-underwriters)	40.07	38.81	42.57	40.19
	(40.0)	(39.0)	(43.5)	(38.0)

	Mean (median) number of days until new forecast (same stock,	
	Before Increase	Before Decrease
Unaffiliated	39.24	39.60
	(37)	(38)
Affiliated (IPO, SEO, co-underwriters)	40.84	39.68
	(41)	(39)

Sample Period is 10/29/1993 to 12/31/2002.

Panel B. OLS Regression

All independent variables are binary. Excludes forecasts which are reiterations of the prior recommendation.

	Days until new recommendation (same stock, same analyst)			
	(1)		(2)	
Greater than Consensus	39.150	(0.114)	39.148	(0.114)
Equal to Consensus	44.535	(0.205)	44.530	(0.205)
Less than Consensus	38.336	(0.110)	38.340	(0.110)
(Greater than Consensus)* (Any Affiliation)	1.044	(1.029)		
(Greater than Consensus)* (IPO Affiliation)			6.962	(3.085)
(Greater than Consensus)* (SEO Affiliation)			-0.644	(2.442)
(Greater than Consensus)* (Co-Affiliation)			0.696	(1.201)
(Equal to Consensus)* (Any Affiliation)	-1.967	(1.402)		
(Equal to Consensus)* (IPO Affiliation)			-0.094	(3.522)
(Equal to Consensus)* (SEO Affiliation)			-0.159	(2.900)
(Equal to Consensus)* (Co-Affiliation)			-2.608	(1.747)
(Less than Consensus)* (Any Affiliation)	0.478	(0.944)		
(Less than Consensus)* (IPO Affiliation)			4.372	(3.108)
(Less than Consensus)* (SEO Affiliation)			-2.704	(2.180)
(Less than Consensus)* (Co-Affiliation)			0.448	(1.096)
Number of Observations	100,345		100,345	
R^2	0.7437		0.7437	

TABLE VII. Comparison of Recommendations to Consensus

Panel A.

OLS regression of the difference between individual analyst recommendations and average analysts recommendations over the past 1, 2, 6, or 12 months respectively on affiliation dummies. A positive difference indicates that the analyst is more optimistic relative to the consensus. The sample is limited to stocks with at least one recommendation in the prior X months, and full data availability for the prior x months. The sample is also limited to those stocks with recent issuances, for which past affiliation is possible, that is stocks with an IPO in the past 5 years, SEO in the past 2 years or bond issuance in the past 1 year. The sample period is 10/29/1993 to 12/31/2002. Standard errors in parentheses.

	Difference to consensus over last x months			
	1 month	2 months	6 months	12 months
Type of Affiliation				
IPO lead-underwriter (past 5 yrs)	0.037	0.040	0.031	0.001
	0.018	0.021	0.025	0.027
SEO lead-underwriter (past 2 yrs)	0.082	0.101	0.115	0.123
	0.017	0.020	0.024	0.026
Co-underwriter	0.039	0.039	0.024	0.004
	0.009	0.011	0.013	0.014
Future underwriter (next 1 yr.)	0.063	0.092	0.136	0.145
	0.013	0.015	0.018	0.019
Bond underwriter (past 1 yr.)	0.076	0.100	0.160	0.193
	0.034	0.040	0.048	0.052
Never Affiliated (to any firm)	-0.033	-0.038	-0.072	-0.082
	0.012	0.014	0.016	0.018
Constant	-0.011	-0.025	-0.054	-0.076
	0.003	0.003	0.004	0.004
Number of Observations	53445	52020	49151	46930
R^2	0.0018	0.002	0.0027	0.0028

Panel B.

OLS regression of the difference between individual analyst recommendations and average analysts recommendations ("consensus") over the past month on recommendation type and affiliation (dummies). The sample is limited to stocks with recent issuances, for which past affiliation is possible, that is stocks with an IPO in the past 5 years, SEO in the past 2 years or bond issuance in the past 1 year. The sample period is 10/29/1993 to 12/31/2002. Standard errors in parentheses.

	Difference to one-month consensus			
		(SE)		(SE)
(Strong Sell, Sell, Hold)	-0.386	(0.003)	-0.385	(0.003)
(Buy)	0.059	(0.004)	0.058	(0.004)
(Strong Buy)	0.474	(0.004)	0.476	(0.004)
(Strong Sell, Sell, Hold)*(Any Affiliation)	0.114	(0.010)		
(Strong Sell, Sell, Hold)*(IPO Affiliation)			0.163	(0.028)
(Strong Sell, Sell, Hold)*(SEO Affiliation)			0.145	(0.028)
(Strong Sell, Sell, Hold)*(Co-Affiliation)			0.129	(0.014)
(Buy)* (Any Affiliation)	-0.048	(0.009)		
(Buy)* (IPO Affiliation)			-0.061	(0.023)
(Buy)* (SEO Affiliation)			-0.014	(0.022)
(Buy)* (Co-Affiliation)			-0.073	(0.012)
(Strong Buy)* (Any Affiliation)	-0.097	(0.010)		
(Strong Buy)* (IPO Affiliation)			-0.164	(0.024)
(Strong Buy)* (SEO Affiliation)			-0.104	(0.023)
(Strong Buy)* (Co-Affiliation)			-0.130	(0.013)
Number of Observations	53,445		53,445	
R^2	0.3489		0.3502	

TABLE VIII. Comparison to Consensus of Annual Earnings Forecasts

Optimism is defined as forecast value minus earnings forecast consensus. The difference is normalized either by the share price on the date of the earnings forecast, or by the absolute value of the consensus. "Div P" indicates a variable normalized by share price, "Div |Cons|" indicates a variable normalized by the absolute value of the earnings-per-share forecast consensus. For normalization by price, the sample is limited to forecasts on days on which the share price is at least $5. For the normalization by the absolute value of the consensus, the sample is limited to forecasts for which the denominator is at least 0.1. For both, the sample is also limited to those stocks with recent issuances, for which past affiliation is possible, that is stocks with an IPO in the past 5 years, SEO in the past 2 years or bond issuance in the past 1 year. The estimated times to the next annual and quarterly earnings announcements are based on the dates of the

	Optimism	
	Div P	Div |Cons|
Type of Affiliation		
IPO lead-underwriter (past 5 yrs)	-0.0011	-0.0190
	(0.0005)	(0.0119)
SEO lead-underwriter (past 2 yrs)	-0.0009	-0.0350
	(0.0004)	(0.0095)
Co-underwriter	-0.0004	-0.0116
	(0.0002)	(0.0047)
Future underwriter (next 1 yr.)	0.0015	0.0763
	(0.0008)	(0.0194)
Bond underwriter (past 1 yr.)	0.0006	0.0030
	(0.0003)	(0.0068)
Never Affiliated (to any firm)	0.0000	-0.0017
	(0.0001)	(0.0015)
Expected time to annual earnings announcement	0.0000	0.0002
[in thousandths]	(0.0000)	(0.0000)
Expected time to next quarterly announcement	0.0000	0.0000
[in thousandths]	(0.0000)	(0.0000)
Constant	-0.0031	-0.0693
	(0.0001)	(0.0018)
Number of Observations	192,132	191,607
R^2	0.0036	0.0039

TABLE IX. Comparison to Consensus of Quarterly Earnings Forecasts

Optimism is defined as forecast value minus earnings forecast consensus. The difference is normalized either by the share price on the date of the earnings forecast, or by the absolute value of the consensus. "Div P" indicates a variable normalized by share price, "Div |Cons|" indicates a variable normalized by the absolute value of the earnings-per-share forecast consensus. For normalization by price, the sample is limited to forecasts on days on which the share price is at least $5. For the normalization by the absolute value of the consensus, the sample is limited to forecasts for which the denominator is at least 0.1. For both, the sample is also limited to those stocks with recent issuances, for which past affiliation is possible, that is stocks with an IPO in the past 5 years, SEO in the past 2 years or bond issuance in the past 1 year.The estimated times to the next annual and quarterly earnings announcements are based on the dates of the

	Optimism	
	Div P	Div |Cons|
Type of Affiliation		
IPO lead-underwriter (past 5 yrs)	-0.0001	0.0038
	(0.0002)	(0.0087)
SEO lead-underwriter (past 2 yrs)	-0.0003	-0.0105
	(0.0001)	(0.0059)
Co-underwriter	-0.0001	-0.0066
	(0.0001)	(0.0032)
Future underwriter (next 1 yr.)	0.0005	0.0239
	(0.0002)	(0.0125)
Bond underwriter (past 1 yr.)	0.0001	0.0037
	(0.0001)	(0.0039)
Never Affiliated (to any firm)	0.0000	-0.0021
	(0.0000)	(0.0010)
Estimated time to next quarterly announcement	0.0000	0.0004
(Estimates in thousandths)	(0.0000)	(0.0000)
Constant	-0.0007	-0.0404
	(0.0000)	(0.0010)
Number of Observations	171,534	156,618
R^2	0.0035	0.0048

TABLE X. Relationship Between Forecast Optimism and Recommendation Optimism, excluding period just prior and just after earnings announcements

The dependent variable is Forecast Optimism, defined as the difference between forecast and consensus forecast, divided by the stock price on the date of the earnings forecast. The sample is limited to earnings forecasts made within the last 15 to 70 days before the earnings announcement. The period just prior to the earnings announcement and just after the preceding announcement are excluded due to the possible confounding effects of strategic earnings forecast behavior. The sample is also limited to stocks for which affiliation is possible, for more homogenous samples across the two groups. Specifically, the sample is limited to forecasts made within 2 years after an seo, 5 years after an ipo or 1 year after a bond issuance. Recommendation Optimism is the difference between the analysts' outstanding recommendation for a given stock minus the current recommendation consensus (over the past month) at the time of the earnings forecast. Affiliation is a binary variable and equal to one if the analyst's brokerage house is affiliated with an investment bank with a past SEO- or IPO- (co- or lead-)underwriting relationship. The sample is limited to forecasts for which price is at le

Panel A. Annual Earnings Forecasts

	Whole Sample	Affiliated	Unaffiliated	Whole Sample
Recommendation Optimism	0.00011	-0.00152	0.00016	0.00016
	(0.00010)	(0.00074)	(0.00010)	(0.00010)
Affiliation				-0.00008
				(0.00061)
Affiliation*(Recommendation Optimism)				-0.00168
				(0.00064)
Constant	-0.00257	-0.00263	-0.00255	-0.00255
	(0.00010)	(0.00071)	(0.00010)	(0.00010)
Number of Observations	11793	340	11453	11793
R2	0.0001	0.0123	0.0002	0.0008

Panel B. Quarterly Earnings Forecasts

	Whole Sample	Affiliated	Unaffiliated	Whole Sample
Recommendation Optimism	0.00006	-0.00019	0.00007	0.00007
	(0.00002)	(0.00019)	(0.00002)	(0.00002)
Affiliation				-0.00045
				(0.00014)
Affiliation*(Recommendation Optimism)				-0.00026
				(0.00015)
Constant	-0.00062	-0.00106	-0.00061	-0.00061
	(0.00002)	(0.00018)	(0.00002)	(0.00002)
Number of Observations	48602	1356	47246	48602
R2	0.0001	0.0007	0.0002	0.0005

TABLE XI. Measures of Trade Reaction: Summary Statistics

Sample period is 10/29/1993 through 12/31/2002.

Panel A. Summary Statistics Daily Trading for Sample Firms

	Mean	Median	Std. Dev.	Min	Max
Number of small buy-initiated trades	48.97	15	92.65	0	2,996
Number of large buy-initiated trades	23.95	3	68.15	0	1,911
Number of small sell-initiated trades	42.65	15	79.54	0	2,453
Number of large sell-initiated trades	19.79	3	56.08	0	1,563
Total number of small buy/sell-initiated trades	91.62	31	169.47	0	3,506
Total number of large buy/sell-initiated trades	43.74	7	123.35	0	3,339
Δ(buy-sell) initiated small trades	6.32	1	33.20	-1,795	2,545
Δ(buy-sell) initiated large trades	4.15	0	19.12	-660	791
Dollar value small buy-initiated trades	383,436	115,206	749,375	0	12,300,000
Dollar value large buy-initiated trades	5,893,682	443,642	23,200,000	0	4,860,000,000
Dollar value small sell-initiated trades	334,827	113,063	641,777	0	16,000,000
Dollar value large sell-initiated trades	4,869,562	396,150	18,700,000	0	3,120,000,000
Dollar value total small buy/sell-initiated trades	718,263	234,400	1,371,392	0	24,400,000
Dollar value total large buy/sell-initiated trades	10,800,000	957,429	41,000,000	0	5,510,000,000
Dollar value of (buy-sell) small trades	48,609	4,775	257,223	-9,344,925	8,854,894
Dollar value of (buy-sell) large trades	1,024,120	0	9,794,781	-1,430,000,000	4,860,000,000
N	*3,636,212*				

Panel B. Summary Statistics Daily Trading for Sample Firms, on Recommendation Event Dates

	Mean	Median	Std. Dev.	Min	Max
Number of small buy-initiated trades	110.43	44	154.48	0	1,545
Number of large buy-initiated trades	70.00	21	128.36	0	1,671
Number of small sell-initiated trades	93.77	39	133.45	0	2,297
Number of large sell-initiated trades	57.71	18	106.77	0	1,334
Total number of small buy/sell-initiated trades	204.20	85	283.42	0	3,449
Total number of large buy/sell-initiated trades	127.71	39	233.28	0	2,931
Δ(buy-sell) initiated small trades	16.65	4	54.95	-1,145	770
Δ(buy-sell) initiated large trades	12.29	2	36.47	-449	588
Dollar value small buy-initiated trades	897,945	364,625	1,246,380	0	11,300,000
Dollar value large buy-initiated trades	20,100,000	3,898,469	56,500,000	0	2,390,000,000
Dollar value small sell-initiated trades	765,132	332,250	1,069,632	0	15,000,000
Dollar value large sell-initiated trades	17,200,000	3,311,196	57,300,000	0	3,120,000,000
Dollar value total small buy/sell-initiated trades	1,663,077	711,550	2,279,749	0	22,300,000
Dollar value total large buy/sell-initiated trades	37,300,000	7,532,875	112,000,000	0	5,510,000,000
Dollar value of (buy-sell) small trades	132,813	33,188	444,851	-7,753,500	5,752,538
Dollar value of (buy-sell) large trades	2,960,799	224,388	22,800,000	-1,200,000,000	1,570,000,000
N	*121,117*				

TABLE XI. Measures of Trade Reaction: Summary Statistics(*continued*)

Panel C. Summary Statistics Daily Trading for Sample Firms, on Earnings Forecast Event Dates

	Mean	Median	Std. Dev.	Min	Max
Number of small buy-initiated trades	102.36	42	143.97	0	1,861
Number of large buy-initiated trades	70.40	21	128.49	0	1,911
Number of small sell-initiated trades	85.60	37	122.58	0	2,297
Number of large sell-initiated trades	57.38	18	105.16	0	1,563
Total number of small buy/sell-initiated trades	187.96	81	262.23	0	3,449
Total number of large buy/sell-initiated trades	127.78	40	231.91	0	3,339
Δ(buy-sell) initiated small trades	16.76	4	52.38	-1,433	1,155
Δ(buy-sell) initiated large trades	13.02	2	36.82	-306	604
Dollar value small buy-initiated trades	847,789	353,975	1,178,798	0	12,300,000
Dollar value large buy-initiated trades	19,900,000	4,004,181	52,900,000	0	2,390,000,000
Dollar value small sell-initiated trades	710,936	317,775	993,142	0	15,000,000
Dollar value large sell-initiated trades	16,500,000	3,393,688	49,200,000	0	3,120,000,000
Dollar value total small buy/sell-initiated trades	1,558,725	680,850	2,138,145	0	22,300,000
Dollar value total large buy/sell-initiated trades	36,400,000	7,761,269	99,900,000	0	5,510,000,000
Dollar value of (buy-sell) small trades	136,853	34,938	424,418	-7,753,500	8,854,894
Dollar value of (buy-sell) large trades	3,348,988	237,084	21,000,000	-1,200,000,000	1,570,000,000
N	*491,008*				

TABLE XII. Trade Reaction: Regression Results

Panel A.

OLS regressions of normalized trade imbalance over event days 0 and 1 on dummies for recommendation level (Strong Sell, Sell, Hold, Buy, Strong Buy) and affiliation. Sample period is 2/1994 through 7/2001. Standard errors in parentheses.

	Large Trade	Small Trade	Difference S-L
Strong Sell	-0.103	-0.105	-0.002
	(0.039)	(0.045)	(0.059)
Sell	-0.118	-0.139	-0.021
	(0.033)	(0.038)	(0.051)
Hold	-0.091	0.007	0.098
	(0.008)	(0.009)	(0.013)
Buy	0.011	0.134	0.123
	(0.008)	(0.010)	(0.013)
Strong Buy	0.112	0.243	0.131
	(0.010)	(0.011)	(0.015)
(Strong Sell)*Affiliation	-0.195	-0.838	-0.642
	(0.273)	(0.317)	(0.419)
(Sell)*Affiliation	0.094	-0.087	-0.180
	(0.247)	(0.287)	(0.378)
(Hold)*Affiliation	-0.001	0.005	0.006
	(0.045)	(0.052)	(0.069)
(Buy)*Affiliation	-0.068	0.013	0.081
	(0.034)	(0.040)	(0.052)
(Strong Buy)*Affiliation	-0.129	-0.023	0.106
	(0.036)	(0.042)	(0.056)
Sample size	86,962	86,962	
R^2	0.0034	0.0085	

Panel B.

Trading reaction is measured by abnormal trade imbalance. Large traders represent trades of at least $50,000, while small traders represent trades of less than $20,000. Recommendation Update is the difference between the given recommendation level (1 for strong sell, 2 for sell, 3 for hold, 4 for buy and 5 for strong buy) and the prior recommendation by the same analyst for the same firm. Sample period 10/29/93-12/31/02. Standard errors in parentheses.

Panel A. Annual Earnings Forecasts

			Unaffiliated Forecasts	Affiliated Forecasts	Difference
Large Traders	Recommendation Update		0.0493	0.0408	-0.0084
			(0.0028)	(0.0138)	(0.0141)
	Constant		0.0112	0.0212	0.0101
			(0.0035)	(0.0156)	(0.0160)
		N	72,255	3,643	
		R^2	0.0042	0.0024	

			Unaffiliated Forecasts	Affiliated Forecasts	Difference
Small Traders	Recommendation Update		0.0439	0.0725	0.0287
			(0.0030)	(0.0146)	(0.0149)
	Constant		0.0494	0.0794	0.0300
			(0.0037)	(0.0165)	(0.0169)
		N	72,255	3,643	
		R^2	0.0029	0.0067	

Table XIII. Trading Reactions to Earnings Forecasts.

Trading reaction is measured by abnormal trade imbalance. Large traders represent trades of at least $50,000, while small traders represent trades of less than $20,000. Earnings forecasts are reported in dollar earnings-per-share. Forecast Update is the difference between the given prediction and the prior prediction by the same analyst for the same firm and fiscal period. Sample period 10/29/93-12/31/02. Standard errors in parentheses.

Panel A. Annual Earnings Forecasts

			Unaffiliated Forecasts	Affiliated Forecasts	Difference
Large Traders	Forecast Update		0.0015	0.0967	0.0952
			(0.0008)	(0.0505)	(0.0523)
	Constant		0.0061	-0.0012	-0.0074
			(0.0019)	(0.0144)	(0.0150)
		N	253,746	4,157	
		R^2	0.0000	0.0009	

			Unaffiliated Forecasts	Affiliated Forecasts	Difference
Small Traders	Forecast Update		-0.0004	-0.0605	-0.0602
			(0.0008)	(0.0534)	(0.0546)
	Constant		0.0726	0.1007	0.0281
			(0.0020)	(0.0152)	(0.0157)
		N	253,746	4,157	
		R^2	0.0000	0.0003	

Panel B. Quarterly Earnings Forecasts

			Unaffiliated Forecasts	Affiliated Forecasts	Difference
Large Traders	Forecast Update		0.0886	0.0903	0.0017
			(0.0155)	(0.1132)	(0.1142)
	Constant		0.0005	-0.0400	-0.0404
			(0.0026)	(0.0218)	(0.0220)
		N	141,227	1,874	
		R^2	0.0002	0.0003	

Small Traders	Forecast Update		-0.0508	-0.0516	-0.0007
			(0.0160)	(0.1153)	(0.1164)
	Constant		0.0602	0.0753	0.0152
			(0.0027)	(0.0222)	(0.0224)
		N	141,227	1,874	
		R^2	0.0001	0.0001	