

DO SECURITY ANALYSTS SPEAK IN TWO TONGUES?*

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Why do security analysts issue overly positive recommendations? One explanation is that analysts pick their favorite stocks and are truly too optimistic. An alternative explanation is that analysts distort recommendations to maximize trade commissions and underwriting business, particularly if affiliated with an underwriter. We use a novel approach to assess the relative importance of both explanations, exploiting the concurrent issuance of recommendations and earnings forecasts. We first show that small traders follow recommendations but not forecast updates; large traders discount recommendations and follow forecasts. As a result, analysts with conflicting interests may distort recommendations upwards to trigger small-investor purchases and to please management, but may not distort forecasts. They may in fact distort forecasts downwards shortly before the announcement to allow management to beat the forecast. If analysts are, instead, truly too optimistic they should express their positive view both in recommendations and in forecasts. We find that affiliated analysts issue more optimistic recommendations but more pessimistic forecasts than unaffiliated analysts. Moreover, the affiliated analysts who have the most positive recommendations outstanding also give the most negative forecasts, consistent with heterogeneity in incentive distortion but not in optimism.

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I. Introduction

A large body of evidence documents the upward distortions of analyst recommendations. It is less clear why these distortions occur. Do analysts truly have too positive expectations about the stocks they cover? Or do they consciously bias recommendations upwards in an effort to please their investment-bank clients and induce investors to purchase the stock? Understanding the causes of overly positive recommendations is important in light of regulatory debates. Fines and mandatory separation of research and investment banking are likely to be effective only if the upward distortions result from misaligned incentives.

We propose a novel approach to assessing the importance of those explanations. We exploit the fact that analysts provide investment advice using different modes of communication, earnings forecasts and stock recommendations, targeting different types of investors. Using IBES data and the New York Stock Exchange Trades and Quotations (TAQ) database (1993-2002), we show that small (individual) investors react more strongly to recommendations than large (institutional) investors. Only large investors, and not small investors, discount the positive content of recommendations (e.g. sell in response to “hold” recommendations), in particular if the analyst is affiliated. In the case of earnings forecasts, instead, large investors strongly react to updates of both affiliated analysts and unaffiliated analysts, while the reaction of small traders is uncorrelated or negatively correlated with the direction of the forecast update. Thus, individual investors appear to respond to the simple “buy” or “sell” message of recommendations, but the more complicated forecasts are more accessible to institutional investors. Hence, analysts can speak in two tongues, targeting the more sophisticated investors with the earnings forecasts, and the less sophisticated ones with the recommendations.

If analysts distort strategically, they will take into account that the net benefit of distortion is likely to decrease with investor sophistication. Sophisticated institutional investors, who have their own buy-side analysts, can detect distortions, and low-quality forecasts may hurt the analyst’s career. Neither is true for less sophisticated, small investors. Thus, strategic distortion should be larger in recommendations than in earnings forecasts. In fact, strategic distortion is likely to lead analysts to bias forecasts downward shortly before the earnings announcement, permitting managers to meet or beat the fore-

casts. Hence, if analysts vary in the degree of distortion, we may find a within-analyst negative correlation between recommendations and forecasts: the most strategic analysts issue the most positive recommendations but the least upward-distorted forecasts (and the most downward-distorted forecasts shortly before the announcement.)

If, instead, analysts are truly overoptimistic, we expect them to express their positive view in both recommendations and forecasts. Hence, if analysts are heterogeneous in their optimism, we predict a positive correlation between recommendation and forecasts: the most optimistic analysts issue the most optimistic recommendations and the most optimistic forecasts.

We evaluate the relative importance of strategic distortion versus overestimation separately for affiliated and unaffiliated analysts. We expect the conflicts of interest that lead to strategic distortion to be more serious if analysts are affiliated with an underwriter of the covered firm. Positive coverage is often viewed as part of an implicit agreement between underwriter and issuer, and analysts' compensation depends, directly or indirectly, on their "support" in generating profits for the corporate finance department.¹

We show that, while affiliated recommendations are significantly more positive than unaffiliated recommendations, affiliated forecasts are significantly more negative than unaffiliated forecasts. Affiliated recommendations are also significantly more likely to be above the consensus than unaffiliated recommendations (69% versus 54%), while the distribution of affiliated and unaffiliated earnings forecast above and below the consensus is not significantly different (39% versus 35% above consensus). These differences between recommendations and forecasts of affiliated and unaffiliated analysts are consistent with strategic distortion but not with (mere) overestimation.

The timing of recommendation and forecast updates corroborates this interpretation. Affiliated analysts update recommendations more quickly when upgrading than when downgrading. Unaffiliated analysts, instead, do not display a significant difference between upgrade and downgrade frequency. We also find that affiliated analysts issue their – on average overly positive – recommendations only if the consensus is very high. They then stick to their positive recommendations when the consensus becomes more negative, rather than take an active updating decision. For forecasts, instead, the timing of

¹ Michaely and Womack [1999]; Michaely and Womack [2003]; Hong and Kubik [2003].

updates is virtually identical for affiliated and unaffiliated analysts. These findings suggest that, compared to earnings forecast updates, recommendation updates are more of a strategic choice than a mere reflection of news about the company. Consistent with this interpretation, we also find that the accuracy of affiliated analysts' forecasts measured either by absolute forecast errors or by relative accuracy rankings, is typically not significantly different from the accuracy of unaffiliated analysts.

Finally, we analyze the within-analyst correlation of recommendations and forecasts for the same stock. As stated above, we expect a positive correlation between recommendations and forecasts if analysts are heterogeneous in true overoptimism, but a negative correlation if analysts are heterogeneous in their incentives to distort. We find a positive correlation for unaffiliated analysts and a negative correlation for affiliated analysts. Thus, those affiliated analysts who express the most overoptimism in recommendations are most pessimistic in their forecasts, consistent with the conflict-of-interest interpretation. In a separate regression, we show directly that affiliated analysts are more likely to make negative errors in their last forecast before the earnings announcement, allowing the firm to meet or beat the forecast. The result holds even controlling for the degree of forecast optimism, i.e., for the difference to the consensus.

We replicate all estimations using quarterly earnings forecasts and long-term growth forecasts. Quarterly earnings forecasts typically yield similar results to annual forecasts, though the quarter schedule constrains analysts more, e.g. in their timing. Long-term growth forecasts are more difficult to categorize in terms of target audience. On the one hand, they are more complex than recommendations, suggesting a sophisticated (large-investor) audience. On the other hand, they are often vague and hard to verify *ex post*, allowing for distortions without negative consequences. Not surprisingly, our results are less clear-cut. Affiliated and unaffiliated long-term growth forecasts are not significantly different. Neither group of traders appears to respond to affiliated long-term growth forecasts, while large traders respond to unaffiliated long-term growth forecasts.

The above results suggest that affiliated analysts make a conscious decision to distort recommendations upwards, to which small investors respond, but not to distort earnings forecasts upwards, to which large investors respond. We conclude that, while genuine overoptimism may also influence analyst distortions, it does not suffice to explain these results. At least some affiliated analysts communicate to different types of in-

vestors “in different tongues.”

This paper builds upon a large literature examining analyst earnings forecasts and recommendations. (See Abarbanell and Lehavy [2003] Barber, Lehavy, McNichols and Trueman [2006], Barber, Lehavy and Trueman [*forthcoming*] for recent examples.) Ertimur, Sunder and Sunder [2007] and Loh and Mian [2006] examine how effective analysts are at using their own forecasts to generate recommendations, and show that analysts who issue more accurate earnings forecasts also issue more profitable recommendations, at least for firms for which earnings are relevant for stock price. Differently from those papers, we focus on optimism of forecasts and recommendations rather than accuracy and profitability. A number of papers examines the impact of conflicts of interest on analyst recommendations. Lin and McNichols [1998] and Michaely and Womack [1999] provide evidence that stock recommendations by affiliated analysts are more favorable but perform more poorly or at best no differently over short (three-day) and long (up to two-year) horizons. Michaely and Womack [1999] emphasize that “buy” recommendations of affiliated analysts after an IPO perform more poorly than those of unaffiliated analysts, both at the time of the recommendation and in the months that follow. They conclude that affiliated recommendations show significant bias and discuss institutional details that may lead to conflicts of interest. Iskoz [2002] confirms these results for strong buy recommendations and provides evidence that institutional investors account for the distortions of affiliated analysts, as far as one can deduce from the quarterly changes in institutional ownership. Recent work suggests that not all investors adjust for analyst affiliation. In Malmendier and Shanthikumar [2007], we provide evidence that small investors follow recommendations “literally” even when an analyst is affiliated, while larger traders account for analyst bias. Mikhail, Walther and Willis [*forthcoming*] provide additional evidence that small investors react in a more naïve way to analysts, using a different sample and slightly different methodology.

Several papers provide insights into the question of whether conflicts of interest explain analyst overoptimism. McNichols and O’Brien [1997] argue that conflicts of interest cause analysts to choose to cover firms for which they have more positive views. At least a portion of the observed overoptimism in recommendations is due to coverage selection, implying that conflicts of interest and genuine overoptimism likely co-exist. Our findings complement the previous results in contrasting recommendation overopti-

mism with (the lack of) forecast overoptimism and in contrasting the behavior of affiliated and unaffiliated analysts. O'Brien, McNichols and Lin [2005] find that affiliated analysts are slower to downgrade stocks from "Buy" or "Hold" than unaffiliated analysts, and are faster to upgrade from "Hold." We incorporate this idea into our set of tests by examining both the upgrade/downgrade speeds of analysts to recommendations as well as their increase/decrease speeds for earnings forecasts. Kolasinski and Kothari [*forthcoming*] examine analyst biases in a different setting, around mergers and acquisitions, for analysts affiliated with both acquirers and targets.

Finally, our paper refers 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. In Section 3, we show the differences in recommendation and forecast optimism between affiliated and unaffiliated analysts. Section 4 examines the trade reactions of small and large investors to recommendations and earnings forecasts. Section 5 evaluates the timing and the within-analyst correlation of recommendation and forecast optimism. Section 6 presents additional analyses on the relation between the level of coverage and recommendation overoptimism. Section 7 concludes.

II. Empirical Strategy

1. Analyst Behavior

Analysts may issue upward-biased recommendations for two reasons. The first explanation is true optimism about the stock. Analysts typically have some say in the choice of stocks they cover, at least beyond the largest-cap stocks, and might choose firms whose prospects they judge favorably, hoping that those are of most interest to their clients. They may also find it more exciting and motivating to research firms where they see great potential. If analysts do not account for the endogenous selection, their average recommendation will be too positive, akin to the winner's curse in auctions: whoever receives the most positive signal should infer that her signal is likely too positive.

This effect might be exacerbated for affiliated analysts. The investment bank's

decision to finance a company implies a fundamentally positive view of that company, which may affect the analyst. Vice versa, it is possible that a very positive analyst assessment encourages the corporate finance division to seek out underwriting business with the firm. In either direction of causality, the winner's curse is likely to be strongest for the analysts with an underwriting affiliation. This type of optimism, based on true beliefs, can occur in the absence of any conflicts of interest.

The second explanation for upward-biased recommendation is strategic distortion. Analysts are more likely to generate trading business with buy recommendations than with sell recommendations, given short-selling constraints. In addition, analysts are exposed to pressure from the management of the company they are covering. In order to increase the market value of their firm, management often calls up analysts and complains about ratings that are "too low" and tends to "freeze out" analysts who do not give positive recommendations (Francis, Hanna and Philbrick [1997]). Similarly, buy-side clients may push sell-side analysts to maintain positive recommendations on stocks they hold.²

Affiliated analysts face additional incentives to distort. Favorable recommendations are generally viewed as an implicit condition of existing underwriting contracts.³ 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 reputational advantages of providing reliable analyses against the incentive to generate trades and, in the case of affiliation, the incentive to support underwriting business.

Analysts have, however, more than one mode of communicating their view on a stock. One mode is stock recommendations; another one is earnings forecasts. If the audiences for these types of communication vary, the optimal distortion may vary as well. Suppose, for example, that individual investors respond to recommendations while institutional investors respond to forecasts. Since sophisticated institutional investors are more likely to detect upward bias, the upside of distorting is more limited for earnings forecasts than for recommendations. In addition, the reputational cost is more severe: in-

² 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.

³ See Bradley, Jordan, and Ritter [2003]. Ljungqvist, Marston and Wilhelm [2006] show that while analysts respond to these incentives, they fail to win underwriting business with positive recommendations.

stitutional investors play a larger role in evaluating analysts, for example through the high profile annual “All-Star Analyst” list of Institutional Investor Magazine. Mikhail, Walther and Willis [1999] find that forecast accuracy affects analyst turnover while returns to stock recommendations do not. Finally, the optimal distortion also varies since the managers of the covered firm may prefer optimistic recommendations but not necessarily overoptimistic forecasts. At least shortly before the earnings announcement, they might in fact prefer lower earnings forecasts in order to create positive earnings surprises.

The different audiences allow us to test whether misaligned incentives induce upward-distortion of recommendations, or whether genuine overestimation suffices to explain overly positive recommendations. In the absence of incentive conflicts, there should be a positive relationship between optimism in recommendations and in forecasts. For example, imagine that an analyst believes that the next earnings announcement will be higher than the consensus. Given the strongly positive returns associated with a positive earnings surprise, the analyst should issue a “buy” recommendation, all else equal. Conversely, if the analyst believes that the next earnings announcement will be lower than the consensus, he should recommend a “sell.” If, instead, overly positive recommendations are a result of strategic distortion, then analysts may not distort forecasts, in order to build up a reputation as knowledgeable and accurate. In fact, analysts may attempt to appease the management for which they have cautious earnings forecasts with bullish recommendations or to please management by biasing forecasts downwards to allow management to beat their earnings forecasts. Hence, if analysts vary in the degree of distortion, we may find a within-analyst negative correlation between the recommendation and the forecast: the most strategic analysts issue the most positive recommendations but the least upward-distorted forecasts – and the most downward-distorted forecasts shortly before the announcement.

2. Empirical measures

In order to distinguish the above hypotheses empirically, we evaluate recommendation and forecast distortion and employ empirical proxies for the sophistication of investors (institutions versus individuals). We determine whether recommendations and forecasts have different audiences by measuring the trade reactions of both investor groups.

Distortion benchmarks. Our proxies for distortion are based on the difference between

an analyst's forecast or recommendation and the existing consensus. For annual (quarterly) earnings forecasts, the consensus calculation is the average of all forecasts made during the year (quarter), following the prior annual (quarterly) earnings announcement. For example, if an annual earnings announcement is expected to be made in February 2000, we start from the set of all forecasts made after the February 1999 earnings announcement. For any given firm on any given day, we then use the most recent forecast of each analyst and calculate the average. The calculation of the recommendation consensus is similar. The key difference is that recommendations do not apply to any specific time period. We thus use a range of periods: one, two, six, and twelve months of prior recommendations. Both calculations closely resemble consensus calculations made in practice, e.g. by IBES (for forecasts) and on *Yahoo! Finance*.

The "distortion" or optimism/pessimism of the analyst is 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, we normalize the difference by share price on the date of the earnings forecast.⁴ The difference between recommendation and consensus is not normalized, since the scale is identical for all firms.

Affiliation. Our 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,⁵ 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 seasoned equity offering (SEO) in the past two years, or if it was a co-underwriter over the same respective periods. We also examine two sources of underwriting bias that have been explored less in the previous literature. The first source is future affiliation, i.e. banks underwriting an SEO in the next one or two years. Analysts of such banks may issue higher recommendations to gain the future business or to increase the potential offer price of the future security offering and due to winner's curse. The number of additional firms we capture with this measure is small since most future underwriters are in previous underwriting relationships. The second source is bond underwriting, in particular lead underwriting of bonds in the past year. As with equity underwriting, posi-

⁴ As a robustness check, we replicate our optimism analyses dividing the difference between earnings forecast and consensus by the absolute value of the consensus, creating a percentage measure.

⁵ Lin and McNichols [1998]; Michaely and Womack [1999].

tive coverage may be part of an implicit agreement between underwriter and issuer.

Investor type. We separate small and large investors by trading size. Following Lee and Radhakrishna [2000], we choose dollar cutoffs rather than share-based cutoffs since they 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. The lower cutoff of \$20,000 splits small and medium trades, and the higher cutoff of \$50,000 splits medium and large trades.⁶ Malmendier and Shanthikumar [2007] show that this classification is an effective measure of individual and institutional investors for the sample period we consider (but not for later years).

Trade Reaction. To capture the reaction of small and large investors to analyst recommendations, we employ measures of “directional trade” (trade initiation). These measures, 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. 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. Accordingly, trades are classified as “buyer-initiated” if the buyer demands immediate execution and as “seller-initiated” if the seller demands immediate execution.

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 (ask) price it is classified as seller (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 (seller-initiated) if the trade occurs at an uptick (downtick), i.e., if the price is higher than the price of the previous trade. We drop trades at the bid-ask

⁶ The cutoffs are derived from the 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 results are robust to several variations (\leq \$5,000; \$5,000-\$10,000; \$10,000-\$20,000).

midpoint, which are also the same price as in preceding trades.⁷

We consider three proxies of buy pressure. The net number of buy-initiated trades for firm i , investor type x , and date t is defined as

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

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

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

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

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

The adjustments are made by year to account for changes in trading behavior over time and by firm to adjust for any consistent differences in trading across firms. These normalizations allow us to compare trading behavior over time and among firms and replace year- and firm-fixed effects in the regression framework. Dividing by the standard deviation controls for systematic differences in the volatility of large and small trades or of the stocks in which large and small traders invest. The normalization makes small and large investors' trade reactions comparable and rules out the possibility that a seemingly more extreme reaction is just the result of higher volatility in trade imbalances over time.

III. Optimism in Recommendations and in Forecasts

We start our empirical analysis by evaluating recommendation and forecast “optimism,” i.e. the difference to the consensus, separately for unaffiliated and affiliated analysts.

1. Data

We obtain analyst recommendations, annual and quarterly earnings forecasts, and long-term earnings growth forecasts as well as information about the analyst identities and brokerage firms from IBES. The recommendations data are available starting from Octo-

⁷ 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.

ber 29, 1993. During the first three months, however, the IBES data contains an unusually high number of recommendations and forecasts.⁸ We thus choose February 1994 as the start of our sample period, but replicate all results for the full period, in both cases until the end of 2002. We also analyze separately a shorter period, through July 2001, to exclude the potential “scandal effects” from 2001 and 2002. We show the results for both the longer period and the shorter sample period in Table VIII, where excluding the “scandal effects” is relevant for the empirical test; in all other tables the choice of sample period does not affect the results and we only show the results for longer period. Our primary sample, from February 1994 through December 2002, contains 2,515 securities for 2,485 firms, as measured by 8- and 6-digit cusips respectively. The shorter period, from February 1994 through July 2001, contains 2,363 securities for 2,338 firms.

IBES converts 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 IBES coding to the following, more intuitive scheme: 5=strong buy, 4=buy, 3=hold, 2=sell, 1=strong sell. A “higher” recommendation is better, and an “upgrade” translates into a positive change in the numerical value.

IBES reports earnings forecasts and realized earnings in earnings-per-share (EPS). Since earnings can be reported in many different ways, e.g. including or excluding extraordinary items, IBES communicates with analysts to ensure that each earnings forecast includes similar items and that the realizations reported in IBES coincide with the forecasts’ definition of earnings. IBES also adjusts forecasts and announcements for stock splits; we use split-adjusted values.

For the sample of annual earnings forecasts, we eliminate observations relating to earnings announcements that occur outside of the SEC mandated reporting window of 0-90 days after the end of the fiscal year. We use the sample of all forecasts occurring between the prior announcement date and the date of the earnings announcement to which the forecast relates. When relating forecast optimism to recommendation optimism, we focus on forecasts occurring 10-80 days prior to the earnings announcement; this sub-period is less affected by incentives to bias forecasts upwards (just after an earnings an-

⁸ In all other months, the number of recommendations per year and even per month is fairly uniform. The high numbers until the end of January 1994 may have to do with large layoffs in the securities industry during at that time; but they also leave room for concerns about data consistency within the IBES sample.

nouncement) or downwards (just before). Thus this is the period for which we are most likely to find “genuine overoptimism.” For most of our analyses, we limit the sample to forecasts with an identified analyst, which eliminates less than two percent of forecasts (6,468 out of 460,990 forecasts).

We also perform all analyses for quarterly earnings and long-term growth forecasts. However, while annual forecasts are comparable to recommendations in terms of time frame (one-year perspective), quarterly forecasts follow a shorter, quarterly schedule and long-term growth forecasts follow a longer and ambiguous schedule. Most often, long-term growth is defined as the expected annual rate of earnings growth (in percent) over the next three to five years (Thompson Financial, 2004); but Sharpe [2005] estimates that the market prices long-term growth forecasts as if applicable to a five to ten year horizon. Long-term growth forecasts are also difficult to categorize in terms of target audience, and the sample is small, e.g. 1,445 affiliated long-term growth forecasts compared to 10,315 affiliated annual earnings forecasts, reflecting a lower number of analysts and brokerage houses. For these reasons, we do not focus on quarterly and long-term growth forecasts, but report all estimations in the Appendix tables.

IBES reports recommendations and earnings forecasts in separate files. In order to match a recommendation with the same analyst’s earnings forecast, we use the analyst identity files of each dataset. The recommendations database uses the “amaskcd” variable and the forecast database uses the “analyst” variable as numeric analyst identification codes, which then maps to names. Since the IBES documentation acknowledges deviations in these two numeric variables, we use both the analyst identity files and a combination of programmed name-matching and hand-matching to ensure a proper match.

We use the SDC New Issues database to obtain underwriting data from 1987 to 2002. We link IBES broker firms and SDC underwriters with the company names provided by the IBES 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 [*forthcoming*] to identify additional matches.⁹

⁹ We are grateful to Adam Kolasinski and S.P. Kothari for providing us with their mapping, which uses corporate websites, LexisNexis, Hoover’s Online, and the Directory of Corporate Affiliations.

2. Sample Analysis: Test for Optimism in Means

We first examine the summary statistics of recommendations and earnings forecasts in the IBES-SDC merged dataset. In the left part of Panel A, Table I, we display the distribution of recommendations both for the full set of analysts and separately for unaffiliated and affiliated analysts, the latter subdivided by the type of affiliation. The vast majority of recommendations are positive or neutral; fewer than 5% are “sell” or “strong sell.” The proportion of “buy” and “strong buy” recommendations is even higher for affiliated analysts. Using the numerical coding of recommendation levels (from 1 to 5), we find that the mean recommendation is significantly higher for affiliated than for unaffiliated analysts. The upward shift is most pronounced for future equity underwriting and least pronounced for bond underwriting, but it is present for all five affiliation categories. Analysts whose brokerage houses do not underwrite any security issuance during the 1987-2002 period, denoted as “Never Affiliated,” have the least positive recommendations and the most sell and strong sell recommendations.

One explanation for the difference in recommendation level is differences between firms covered by affiliated and unaffiliated analysts. For example, the upward shift in recommendations of affiliated analysts might be due to better prospects of firms that access the capital market for external financing. In Panel B, we calculate 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. The mean difference between affiliated and unaffiliated analyst recommendations is virtually identical and highly significant, ruling out sample composition as an explanation.

Turning from recommendations to earnings forecasts, we find that the pattern reverses. The right half of Panel A shows summary statistics for forecasts of annual earnings per share, pertaining to the announcement following the earnings forecast date. The average earnings forecast is \$1.67 per share. Earnings forecasts tend to be positive, with even the 25th percentile being \$0.78. In sharp contrast to recommendations, affiliated analysts issue lower earnings forecasts than unaffiliated analysts. The mean earnings forecast of affiliated analysts is significantly lower than that of unaffiliated analysts, both jointly and separately for each category, other than bond underwriting. Moreover, the distribution of earnings forecasts of affiliated analysts displays less variance.

As shown in Panel B, these patterns also hold when the sample is limited to recent

security issuers. In fact, while the average earnings forecast of affiliated analysts remains (by definition) the same, the difference to unaffiliated forecasts almost doubles.

This discrepancy persists when evaluating recommendations and forecasts relative to the consensus. In particular, we compare recommendations to the average of outstanding recommendations during the past month and forecasts to the average forecast made after the prior announcement (normalized by share price on the day of the forecast). When affiliated analysts make forecasts, their outstanding recommendations are above the consensus with 69% probability, while their forecasts are above the consensus with only 39% probability. For an unaffiliated analyst, instead the likelihood of being above the consensus is much lower for outstanding recommendations (54%), but similar for the forecasts (35%).

Table II compares affiliated and unaffiliated analyst behavior in a regression framework. In Column (1), we regress the difference of recommendation levels and consensus on indicators for affiliation categories, including “never affiliated”. We restrict the sample to those firms with recent stock or bond issuances as in Table 1, Panel B, to eliminate any heterogeneity in stocks that “affiliated” and “unaffiliated” analysts cover. We find that the recommendations of any type of affiliated analyst lie significantly above the consensus while the recommendations of “never affiliated” analysts lie significantly below. Column (2) shows the analysis for annual forecasts, also controlling for the timing within the fiscal year, given the prior literature showing time patterns in earnings forecast optimism (see later Table VIII). We find that SEO lead- and equity co-underwriters issue annual forecasts that are significantly lower, relative to the consensus, than unaffiliated forecasts. The difference is insignificantly negative for IPO lead-underwriters. (Note, however, that the controls for time until the next earnings announcement require a previous year of earnings announcement history, eliminating half of the IPO lead-underwriting sample.) For all types of past equity or bond affiliation, we find a sharp difference in their recommendation and forecast optimism. Interestingly, future equity and recent bond underwriters are more positive both in their recommendations and in their forecasts.

The differences in mean recommendations and mean forecasts between analysts with past equity affiliation and unaffiliated analysts is hard to reconcile with affiliated analysts’ being genuinely more positive optimistic. While recommendations may reflect

more information than the analysts' expectations about the next earnings updates, it is hardly conceivable that persistently more optimistic beliefs about the firm's performance in the coming year could translate into persistently more negative beliefs about the next earnings. Incentives to distort recommendations (but not forecasts) upwards, instead, can explain both patterns. Analysts distort recommendations upwards to induce small traders to buy, but abstain from forecast distortions, given that large investors would not be misled. In addition, analysts may *lower* earnings forecasts, so that the firm can "meet or beat" earnings expectations. We explicitly examine this possibility in Section V.

Future underwriters' and bond underwriters' optimism or pessimism for earnings forecasts appear qualitatively different. Given that prior literature focuses on past equity affiliation, and the results for these three groups are more consistent, we will focus on past equity affiliation (SEO- and IPO- lead- and co-underwriting) in our remaining tests.

We also replicate all statistics and regressions of Tables I and II for quarterly earnings forecasts and long-term growth forecasts, shown in Appendix-Tables A1 and A2. Quarterly earnings forecasts are in general positive, at levels of roughly one quarter of the annual forecasts (Appendix-Table A1, Panel A). As with annual earnings, equity-underwriting affiliated analysts issue significantly lower forecasts than unaffiliated analysts, but bond-underwriting affiliated analysts issue significantly higher forecasts. Unaffiliated earnings forecasts are significantly higher in the sample of recent issuers (Panel B). Long-term growth forecasts are significantly higher for equity-underwriting affiliated analysts and significantly lower for bond-underwriters and "never-affiliated" underwriters. Table A2, Column (1), shows that results for quarterly earnings forecasts replicate in the regression framework. The results for long-term growth forecasts (Column (2)) are more mixed, with co-underwriters issuing lower long-term growth forecasts than unaffiliated analysts, and future equity underwriters issuing higher forecasts. The results for IPO-lead, SEO-lead and bond underwriters are insignificant.

IV. Trade Reaction

Before examining analysts' recommendation and forecast behavior in more detail, we evaluate small and large trade reactions to recommendations and to forecasts. A necessary assumption for analysts to speak in two tongues is that small traders follow recom-

mendations more literally than large traders, but that large traders react more strongly to forecasts. In this section we test whether this is the case.

1. Data

The raw trading data is 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 2,801 securities for 2,723 firms, as defined by 8-digit and 6-digit CUSIPs, respectively.

2. Analysis

We test whether small (individual) investors and large (institutional) investors display no significant difference in their reactions to recommendations and forecasts. We do not test through which mechanism traders react to the information. For example, small traders may read about the recommendations and forecasts in the news, or recommendations and forecasts may prompt brokers to conduct sales calls to which small traders react. Regardless of the mechanism, if small investors react to recommendations but less to earnings forecasts, analysts can satisfy their clients' demand to issue more positive predictions about the firm through the recommendations, while maintaining their reputations with more sophisticated investors through earnings forecasts.

Table III displays the sample statistics of the trade reactions to recommendations and earnings forecasts of small and large traders. The first three columns ("All Dates") display statistics for the full sample, the next three columns ("Recommendation Dates") for recommendation event days and the last three columns ("Annual Earnings Forecast Dates") for earnings-forecast event days. Small traders initiate more trades than large traders, over twice as many in the full sample. The gap is smallest on earnings-forecast dates when small traders make only 50% more trades than large traders. Both groups increase their buy and their sell pressure on recommendations and earnings-forecast event days: both the number of trades and the dollar value traded increasing in both groups.

Table IV displays trade reactions to updates of recommendations and earnings forecasts, i.e. the difference to the previous recommendation (Columns 1-3) and the dif-

ference to the previous forecast, normalized by share price (Columns 4-6). We conduct the regressions separately for unaffiliated and affiliated updates. For recommendations, the reactions of both small and large traders are significantly positive, indicating that all traders exert more buy pressure when a recommendation level increases. However, the sensitivity of small traders—but not that of large traders—is significantly higher for affiliated than for unaffiliated recommendations. Moreover, small traders also have higher intercepts for both groups than large traders, i.e., they exert more buy pressure across all levels of recommendation. The results confirm the findings in Malmendier and Shanthikumar [2007] that large investors discount recommendations while small investors follow them literally. While large investors react negatively to a hold recommendation, small investors display no significant trade reaction. Moreover, small investors react as strongly to a buy recommendation as large investors do to a strong buy and 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.

For annual forecasts, instead, large traders' reaction is significantly positive, both for unaffiliated and for affiliated analysts but significantly more positive for affiliated analysts. The stronger reaction to affiliated forecast updates is economically large: the coefficient is about 64 times as large. In contrast, small traders react significantly positively on the day of a forecast update (intercept) but not in the direction of the update. Instead, the slope coefficient is negative, significantly so for unaffiliated analysts.

Appendix-Tables A3 and A4 show the same summary statistics and regression results for trade reactions to quarterly earnings forecasts and long-term growth forecasts. Large traders react significantly positively to quarterly earnings forecast revisions by unaffiliated analysts and insignificantly positively to those by affiliated analysts, though the coefficient estimate is very similar. In contrast, the estimated coefficients for small traders are insignificantly negative for unaffiliated analysts and insignificantly positive for affiliated analysts. For long-term growth forecasts, large traders have a significant positive reaction to unaffiliated updates and an insignificant reaction to affiliated updates, while small traders have an insignificant reaction to both affiliated and unaffiliated updates. The intercept coefficient for the unaffiliated sub-samples is significantly positive for both types of traders. That is, both large and small traders show a positive response to the oc-

currence of an unaffiliated forecast update. The intercept is roughly four times as large for small traders. Neither group of traders appears to react to affiliated forecasts, although the differences between reaction to unaffiliated and affiliated forecast updates are insignificant. Given that small traders do not react to long-term growth forecast content (insignificant slope), it should be possible for analysts to target these statements towards large investors. However, given that neither group reacts to affiliated analysts, it is unclear if affiliated analysts have that option. As such, we cannot make predictions regarding unaffiliated versus affiliated long-term growth behavior, relative to recommendations and annual earnings forecasts.

In summary, large traders react much more strongly to earnings forecasts than small traders, with the differences being significant for annual forecasts of both unaffiliated and affiliated analysts and quarterly forecasts of affiliated analysts. The results support the idea that analysts can target large traders with their earnings forecasts and small traders with their recommendations.

V. Test for Optimism in the Timing of Updates

Recommendation Updating. In order to further test for “strategic distortions” of recommendations, as opposed to true optimism, we consider the timing of recommendations and earnings forecasts, separately for affiliated and unaffiliated analysts. It is conceivable that part of the upward bias of affiliated analysts is due to quicker reactions 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.

Table V, Panel A, shows that the opposite is the case. Affiliated analysts update their recommendations more slowly, waiting 50 more days on average. The difference is entirely driven by positive recommendations: 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: Affiliated analysts wait about two and a half months longer than unaffiliated analysts before downgrading a stock.

The regression analysis in Panel B, Columns 1 and 2, shows that the differences in timing are significant. The dependent variable is the number of days until the next up-

date for a given level of recommendation. Affiliated analysts wait 91 days longer than unaffiliated analysts before downgrading a strong buy, 49 days longer until changing a buy, but 32 days *less* before changing a hold, sell, or strong sell.

In the regression in the right half of Panel B, we compare the difference between a recommendation and the consensus at the time of issuance, separately for unaffiliated and affiliated recommendations and by recommendation level. Not surprisingly, unaffiliated strong buy recommendations are on average above the consensus, buy recommendations only slightly (though still statistically significantly) above the consensus, and hold, sell, and strong sell recommendations below the consensus. Affiliated analysts, however, differ in their issuance pattern. Their “strong buys” and “buys” are significantly less above the consensus. Hence, they wait until the consensus is high before issuing a positive recommendation or, if the consensus is declining, only issue if the consensus is still high enough. Similarly, they issue negative or neutral recommendations only after a significantly larger fraction of recommendations outstanding is on the same level. These findings imply that affiliated analysts tend not to “stand out.” Their issuance is timed to coincide with a consensual view of most other analysts covering the stock.

The speed of upgrading and downgrading in itself is consistent with both the true beliefs and incentive conflicts explanations. If affiliated analysts truly have an overly optimistic view of the company they cover, they might put more weight on positive news, which is consistent with their prior beliefs, than on negative news (see Daniel, Hirshleifer and Subrahmanyam [1998] for a discussion of the relevant literature and an application to investor behavior). If affiliated analysts strategically distort recommendations, they may stick to positive recommendations longer than to negative ones. However, if the true beliefs argument applies, we would expect similar differences in the persistence of earnings forecasts, i.e. the analyst should incorporate positive information more quickly and negative information more slowly in *both* recommendations and earnings forecasts. Thus by analyzing the timing behavior of earnings forecasts, we can further distinguish between the two explanations.

Forecast Updating. Table VI displays similar statistics and regression results for the timing of annual earnings forecasts. (Quarterly earnings forecasts are in Appendix-Table A5; long-term growth forecasts are in Appendix-Table A6.) In contrast to recommendation

timing, we do not find a significant difference for affiliated and unaffiliated forecast updates. Whether we focus on overall forecast frequency or on forecasts above, equal to, or below the consensus, affiliated analysts update at almost exactly the same speed as unaffiliated analysts, for both their annual and quarterly earnings forecasts. The only larger difference is the time until an earnings-per-share estimate decrease (last column of Panel A). In this case affiliated analysts hold the forecast 2.9 days longer than unaffiliated analysts. Panel B, Column 1, reveals that none of these differences are significant. If we split affiliation into subcategories (Column 2), we find that only one coefficient is significant: the difference between co-underwriter affiliated and unaffiliated update speed for forecasts above the consensus – but in the opposite direction: the coefficient is positive.

The results are in sharp contrast to recommendations behavior, which shows a drastic shift in timing using virtually every measure. At least partly, the lack of a difference in the forecast updating behavior of affiliated and unaffiliated earnings forecasts might be shaped by the quarterly schedule of earnings releases. Analysts may feel compelled to react to these news events in a timely manner. However, for both quarterly and annual earnings forecasts, affiliated analysts could still exploit more of the 90-day interval between quarterly announcements. They choose not to do so. Thus, the discrepancy between the updating decision in the case of recommendations and of earnings forecasts provides evidence of another dimension of strategic distortion.

VI. Test for Optimism in Correlations

A third test of the two explanations for positive recommendations involves the direct comparison of recommendations and forecasts by the same analyst. As discussed above, analyst heterogeneity has different implications for the within-analyst correlation of recommendation and forecast updates, depending on whether true optimism or strategic distortion explains the overly positive recommendations. If analysts are truly overoptimistic, we expect them to express their positive view in both recommendations and forecasts. Hence, analyst heterogeneity in optimism implies a positive correlation between recommendations and forecasts: the most optimistic analysts issue the most optimistic recommendations and the most optimistic forecasts. If, instead, analysts distort strategically and vary in the degree of incentive misalignment, we may find a within-analyst negative cor-

relation between recommendations and forecasts: the most strategic analysts issue the most positive recommendations but the least upward-distorted forecasts (and the most downward-distorted forecasts shortly before the announcement.) We analyze both the within-analyst correlation and examine separately forecast behavior shortly before earnings announcements.

Within-Analyst Correlation between Recommendations and Forecasts. In order to test whether the *same* analyst who is issuing a more positive recommendation also issues a more positive earnings forecast, we directly link the recommendations and forecasts by analyst. We compare the “optimism” of the forecasts and recommendations, measured as the difference to the respective consensus.

Table VII reports the results. The sample is limited to earnings forecasts which occur between 10 and 80 days before the relevant earnings announcement. That is, we exclude earnings forecasts just before the announcement and just after the preceding quarterly announcement. (Below, we analyze the last forecast before the announcement directly.) As above, the sample of firms is limited to recent issuers to increase homogeneity. Panel A displays the relationship between annual earnings forecasts and recommendations outstanding at the time of the forecast, i.e. issued on the same or a prior day.¹⁰

For unaffiliated analysts, we find a positive relation between forecast optimism and recommendation optimism ($t=1.79$, $p=7.3\%$). The more positive an unaffiliated analyst’s recommendation is relative to the existing consensus, the more positive will the earnings forecast be. In contrast, for affiliated analysts there is a significantly negative coefficient for the regression of forecast optimism on recommendation optimism ($t=1.79$, $p=7.4\%$). Hence, the more positive an affiliated analyst’s recommendation is relative to the existing consensus, the more negative will his earnings forecast be, relative to the existing consensus. As shown in the pooled regression in the last column, the difference between the coefficients is significant with a t-statistic of 2.00. For a one standard deviation increase in recommendation optimism, unaffiliated analysts would increase their average forecast by 6.3% (evaluated at the average forecast optimism), while affiliated analysts would decrease their forecast by 53.7%. The difference between the two analyst groups, is economically significant, particularly given that the intercept estimates are virtually

¹⁰ About a quarter of forecasts are accompanied by a new recommendation on the same day.

identical for the two groups. This implies that affiliated analysts will issue lower earnings forecasts for the same recommendation level.

The results are even stronger if we further reduce analyst heterogeneity by eliminating “never affiliated” and “always affiliated” analysts, include analyst fixed effects, and include year fixed effects. The relationship between annual earnings forecast optimism and recommendation optimism becomes more positive for unaffiliated analysts, with a coefficient estimate of 0.00031 ($t=2.35$, $p=1.9\%$). The results for affiliated analysts are identical as there are no analysts in the “always affiliated” category, and thus the difference between the two groups is even stronger.

The results are also similar for quarterly earnings forecasts, shown in Appendix Table A7, though the coefficient estimates and difference between the two slope coefficients are only marginally significant or insignificant. For long-term growth forecasts, Appendix Table A8 shows a significantly positive relationship coefficient for both unaffiliated and affiliated analysts with no significant difference between the two.

The above evidence points strongly towards the “incentive conflict” explanation: those analysts who have the most distorted incentives issue the most positive recommendations and the least positive forecasts. With the genuine overestimation (“winner’s curse”) story, we would expect correlated optimism in both forecasts and recommendations for the affiliated analysts, or at least independence between the two.

In untabulated regressions we repeat the analysis presented in Table VII, Panel A, conditioning on the recommendation level. As expected under the conflict of interest hypothesis, the negative relationship between forecast and recommendation optimism for affiliated analysts is strongest for buy and strong buy recommendations.

The difference in forecast updating does not result in better ex-post accuracy. In untabulated regressions, we analyze accuracy, measured either as (1) absolute forecast error, forecast minus realization, normalized by share price or as (2) relative forecast error rank, as in Mikhail, Walther and Willis [1999].¹¹ Using the same sample and controlling for the time remaining until the earnings announcement, we find that forecast accuracy is lower for IPO-, SEO-, and co-underwriting affiliated analysts and higher for bond under-

¹¹ The second measures ranks all analysts covering a stock for the given period by the forecast error of their last forecast during the period, normalized by the total number of analysts covering the firm. The resulting rank ranges from 0 to 1.

writing affiliated analysts. However, the differences are significant only for some specifications. For example, using measure (1), unaffiliated analysts have an absolute annual earnings forecast error of 0.0018 on average, SEO underwriters have an almost identical error, and IPO and co-underwriters have a much higher error of 0.0039 and 0.0041, respectively. Under this specification, co-underwriters also issue significantly less accurate quarterly and annual forecasts than unaffiliated analysts ($t=2.00$ and 2.88 respectively) but all other differences are insignificant.

As a last step, we repeat the analysis of recommendation optimism and forecast optimism using the analyst's *next* recommendation rather than the same-day or past recommendation we used in Panel A. Using the next recommendation amounts to analyzing the correlation between the two types of optimism at the time of recommendation issuance rather than forecast issuance. Based on our prior findings on the timing on recommendations and forecasts in Sections III and V we expect the signs of the correlation coefficients for affiliated analysts to reverse. While affiliated analyst issue more positive recommendations on average than unaffiliated analysts, they also maintain positive recommendations longer. If affiliated analysts “hide in the crowd” when issuing a positive recommendation and delay downgrading then the relationship between forecast optimism and the analyst's *next* recommendation may be positive. That is, at some point the affiliated analyst is forced to downgrade, and at that stage there will be a positive relationship between their new lower recommendation and their forecast optimism.

Panel B presents the results. Since the “next” recommendation may occur after the firm's earnings announcement (in which case the relationship is affected by the actual announcement), we include interactions with “before announcement” and “after announcement” dummies. For unaffiliated analysts, the relationship between (before-announcement) recommendation optimism and forecast optimism continues to be insignificantly positive. For affiliated analysts, however, the relationship turns from marginally significantly negative in Panel A to significantly positive. The after-announcement coefficient, instead, is insignificantly positive for affiliated analysts, but negative for unaffiliated analysts, consistent with revised recommendations and earnings expectations based on the announcement “surprise.” The difference between the post-announcement coefficients is insignificant. Appendix Table A7, Panel B, shows similar results for quar-

terly forecasts. Coefficients have the same sign, but lower significance. A similar analysis for long-term growth forecasts (Appendix Table A8, Panel B) finds no significant results.

Combining both sets of results in Panels A and B, affiliated analysts appear to issue more negative forecasts while, at the same time, their outstanding recommendations are more optimistic than the consensus. With some delay, affiliated analysts incorporate the negative information into their recommendations, so that the relationship between optimism in their forecasts and in their *next* recommendation is positive. For unaffiliated analysts, instead, we observed a positive relationship both between forecast and prior recommendation (statistically significant) and between forecast and next recommendation (insignificant), as long as both are prior to the actual announcement.

Forecasts Immediately Prior to Announcements. The differences in within-analyst correlation in forecast and recommendation optimism confirm that affiliated analysts “speak in two tongues” while unaffiliated analysts do not. It is less clear, however, why the within-analyst correlation in Panel A is significantly negative, rather than insignificant or simply less positive than those of unaffiliated analysts. One possible explanation is that affiliated analysts respond particularly strongly to pressure from management shortly before announcement dates. As discussed above, lower earnings forecasts close to the announcement help firms achieve positive earnings surprises¹². To test this explanation, we examine whether an analyst’s last earnings forecast before the announcement is above the announced earnings (positive forecast error) or below (negative forecast error). If affiliated analysts issue lower forecasts to allow management achieve positive earnings surprises, their likelihood of negative forecast errors should be higher.

We estimate a logit model, regressing a dummy for positive forecast error on indicators for affiliation type and controls for the expected time to the next annual earnings announcement. Table VIII presents the results for annual earnings. In the first two columns, we use the usual sample period. In the last two columns, we repeat the analysis for the pre-scandal period, using August 1, 2001 as a cutoff, since media coverage of analysts’ conflicts of interest skyrocketed in August 2001, after Morgan Stanley settled a suit

¹² The earnings forecast “walk-down” is documented in Richardson, Teoh and Wysocki [1999]. For annual earnings, they find that analysts tend overly optimistic forecasts near the beginning of the year and overly pessimistic forecasts nearer the time of the annual earnings announcement. Baik and Yi [2006] document that firms meet or beat the forecasts of affiliated analysts more often than those of unaffiliated analysts.

against the high-profile analyst Henry Blodget and additional suits were filed against Morgan Stanley's "star technology analyst" Mary Meeker (Financial Times, 2001).

The results show that IPO-lead-underwriter affiliated analysts are significantly more likely to issue final forecasts that are below the realization in the full sample. The results are similar after adding a control for the optimism expressed in the earnings forecast (Column 2). Thus affiliated analysts are not only more likely to make negative forecast errors on average, but also controlling for how much lower their forecasts are compared to the consensus. That is, for the same deviation from the consensus, a forecast is particularly likely to be too low if it is issued by an affiliated analyst.

Surprisingly, the coefficient estimate becomes smaller and insignificant when restricting the sample to the pre-scandal period ($t=1.61$ and $t=1.46$ in Columns 3 and 4). For SEO-lead-underwriters, the coefficient estimates are small and insignificant. Equity co-underwriters, instead, are significantly more likely to issue final forecasts below the realization in the pre-scandal period (but not the full period). The results are generally even stronger for quarterly earnings forecasts.

Overall the more pessimistic forecasts of affiliated analysts appear to be strategically designed to "please management," and part of affiliated analysts' biased behavior.

VII. Conclusion

This paper provides 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. Instead, affiliated analysts issue similar or more negative forecasts, compared to unaffiliated analysts. In addition to the mean recommendation and forecast levels, affiliated and unaffiliated analysts also differ in the relationship between recommendation optimism and forecast optimism. Recommendations and forecasts are significantly negatively correlated within analyst for affiliated analysts, but significantly positively for unaffiliated analysts. Additional results on the timing and updating of recommendations and forecasts suggest that affiliated analysts "hide in the crowd" when issuing new recommendations, but then maintain positive recommendations longer than unaffiliated analysts.

Our findings suggest that affiliated analysts strategically choose to display opti-

mism about the firms they cover in one outlet, recommendations, which, as we show, are consumed most directly by small investors. They abstain from doing so in another outlet, earnings forecasts, which, as we show, are consumed most directly by large investors. While overoptimistic unaffiliated analysts may thus be expressing their true beliefs, affiliated analysts appear to react to incentive misalignment.

Our findings have implications for the policy debate about the appropriate regulations to be imposed on brokerage houses. Given the contrast in behavior for recommendations and earnings forecasts, 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 incentive distortion analyzed in this paper may have more general applicability. 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 agents. To the extent 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. However, such measures would come at the cost of market efficiency.

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TABLE I. Sample of Recommendations and Annual Earnings Forecasts

Recommendations are translated into numerical values following the scheme 1=strong sell, 2=sell, 3=hold, 4=buy, 5=strong buy. Earnings Forecasts are reported in earnings-per-share dollars. The forecast sample is limited to forecasts pertaining to the closest following annual earnings announcement, and to earnings announcements that occur during the SEC mandated window of 0-90 days after the end of the relevant fiscal year.

Panel A: Entire Sample	Recommendations								Annual Earnings Forecasts					
	Sample size	Percentage by category					Numerical translation		Sample size	Mean	Standard Deviation	Percentile		
		Strong Sell	Sell	Hold	Buy	Strong Buy	Mean	Standard Deviation				25th	50th	75th
All	112,694	1.65	2.92	36.33	33.30	25.81	3.79	0.92	460,936	1.68	1.73	0.78	1.42	2.27
Unaffiliated	104,811	1.72	3.01	37.11	32.86	25.30	3.77	0.92	450,753	1.68	1.73	0.79	1.43	2.27
Affiliated	7,883	0.75	1.67	25.97	39.13	32.47	4.01	0.85	10,183	1.58	1.81	0.70	1.25	2.10
IPO lead-underwriting (past 5 years)	1,039	0.67	1.44	23.97	38.31	35.61	4.07	0.84	954	1.16	1.10	0.58	1.05	1.63
SEO lead-underwriting (past 2 years)	1,095	0.46	1.64	22.37	38.63	36.89	4.10	0.83	1,303	1.29	1.13	0.60	1.18	1.72
Co-underwriting equity ¹	3,854	0.99	1.69	26.62	38.74	31.97	3.99	0.86	5,623	1.41	1.98	0.60	1.12	1.80
Future SEO (next 2 years)	627	0.23	10.11	32.16	28.75	28.75	4.26	0.70	778	1.24	1.03	0.61	1.15	1.75
Bond lead underwriting (past year)	1,929	0.62	1.97	28.56	38.57	30.27	3.96	0.85	2,388	2.32	1.71	1.14	1.99	3.25
Never Affiliated ²	6,250	3.76	4.32	36.70	28.35	26.86	3.70	1.03	183,212	1.72	1.76	0.80	1.45	2.32

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	Recommendations								Annual Earnings Forecasts					
	Sample size	Percentage by category					Numerical translation		Sample size	Mean	Standard Deviation	Percentile		
		Strong Sell	Sell	Hold	Buy	Strong Buy	Mean	Standard Deviation				25th	50th	75th
All	50,504	1.49	2.54	34.48	34.11	27.38	3.83	0.91	199,289	1.79	1.68	0.81	1.49	2.45
Unaffiliated	42,842	1.61	2.68	35.96	33.24	26.50	3.80	0.92	189,391	1.80	1.67	0.82	1.50	2.46
Affiliated ³	7,662	0.77	1.72	26.21	38.98	32.32	4.00	0.85	9,898	1.59	1.83	0.69	1.25	2.10

Sample period is 2/01/1994 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.

TABLE II. Comparison to Consensus

OLS regressions of the difference between individual analyst recommendations and consensus (average analysts recommendations over the past month) in Column (1) and of the difference between individual analyst forecasts and consensus normalized by share price in Column (2) on affiliation dummies and, in Column (2), also on expected time to the next annual and quarterly earnings announcement. For both columns, a positive difference indicates that the analyst is optimistic relative to the consensus. For recommendations, the sample is limited to stocks with at least one recommendation in the prior month and full data availability for the prior month. For forecasts, the sample is limited to stocks with a share price of at least \$5. For both, the sample is also limited to stocks for which past affiliation is possible, i.e., stocks with an IPO in the past 5 years, SEO in the past 2 years or bond issuance in the past 1 year. Standard errors (in parentheses) are robust to arbitrary heteroskedasticity and within-date correlation.

	Recommendations (1)	Annual Earnings Forecasts (2)
Type of Affiliation		
IPO lead-underwriter (past 5 yrs)	0.0361 (0.0141)	-0.0011 (0.0009)
SEO lead-underwriter (past 2 yrs)	0.0762 (0.0194)	-0.0009 (0.0003)
Co-underwriter	0.0353 (0.0089)	-0.0004 (0.0002)
Future underwriter (next 1 yr.)	0.0904 (0.0220)	0.0013 (0.0004)
Bond underwriter (past 1 yr.)	0.0628 (0.0128)	0.0007 (0.0001)
Never Affiliated (to any firm)	-0.0349 (0.0136)	0.0000 (0.0001)
Expected time to annual earnings announcement [in thousandths]		0.0076 (0.0004)
Expected time to quarterly earnings announcement [in thousandths]		0.0008 (0.0009)
Constant	-0.0104 (0.0034)	-0.0031 (0.0001)
Number of Observations	50,504	186,588
R ²	0.0019	0.0036

TABLE III. Measures of Trade Reaction: Summary Statistics

	All Dates			Recommendation Dates			Annual Earnings Forecast Dates		
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.
Number of small buy-initiated trades	49.67	15	93.38	112.41	47	153.83	105.52	44	146.09
Number of large buy-initiated trades	24.27	3	68.90	73.94	23	132.31	72.35	22	130.52
Number of small sell-initiated trades	43.25	15	80.28	95.06	42	132.64	88.05	39	124.59
Number of large sell-initiated trades	20.06	3	56.73	61.02	19	110.15	58.85	19	106.77
Total number of small buy/sell-initiated trades	92.92	31	170.90	207.47	91	281.79	193.57	84	266.31
Total number of large buy/sell-initiated trades	44.33	7	124.73	134.96	42	240.56	131.20	42	235.52
Δ (buy-sell) initiated small trades	6.42	1	33.54	17.34	5	55.74	17.46	5	52.95
Δ (buy-sell) initiated large trades	4.21	0	19.29	12.92	2	37.54	13.50	2	37.46
Dollar value small buy-initiated trades	388,698	116,856	755,416	920,187	396,875	1,244,425	874,726	372,000	1,197,966
Dollar value large buy-initiated trades	5,989,505	438,688	23,500,000	21,400,000	4,226,063	58,900,000	20,400,000	4,173,028	54,000,000
Dollar value small sell-initiated trades	339,368	114,575	647,712	781,451	356,664	1,065,532	731,891	331,009	1,010,196
Dollar value large sell-initiated trades	4,945,342	391,450	19,000,000	18,300,000	3,599,225	59,800,000	16,900,000	3,521,013	50,200,000
Dollar value total small buy/sell-initiated trades	728,066	237,644	1,383,074	1,701,638	769,713	2,272,189	1,606,617	712,225	2,173,989
Dollar value total large buy/sell-initiated trades	10,900,000	945,788	41,600,000	39,700,000	8,176,861	116,000,000	37,400,000	8,065,381	102,000,000
Dollar value of (buy-sell) small trades	49,329	4,813	259,760	138,736	37,281	452,836	142,835	37,750	430,131
Dollar value of (buy-sell) large trades	1,044,164	0	9,914,168	3,125,555	242,431	23,800,000	3,476,123	258,794	21,400,000
	<i>N</i>	<i>3,586,144</i>		<i>109,939</i>			<i>460,936</i>		

Sample period is 2/01/1994 through 12/31/2002.

TABLE IV. Trade Reaction: Regression Results

Trade reaction is measured by abnormal trade imbalance. Large traders represent trades of at least \$50,000; small traders represent trades of less than \$20,000. Recommendation update is the difference between a recommendation (1=strong sell, 2=sell, 3=hold, 4=buy and 5=strong buy) and the prior recommendation by the same analyst for the same firm. Forecast update is the difference between a forecast and the prior forecast by the same analyst for the same firm, normalized by share price. The sample period is 2/01/94-12/31/02. Standard errors (in parentheses) are robust to arbitrary heteroskedasticity and within-day correlation.

		Recommendations			Annual Earnings Forecasts		
		Large Traders	Small Traders	Difference (S-L)	Large Traders	Small Traders	Difference (S-L)
Unaffiliated	Update	0.0497	0.0447	-0.0050	0.6033	-0.3681	-0.9714
		(0.0035)	(0.0035)	(0.0050)	(0.1436)	(0.1226)	(0.1889)
	Constant	0.0103	0.0495	0.0391	0.0112	0.0692	0.0580
		(0.0069)	(0.0072)	(0.0100)	(0.0052)	(0.0061)	(0.0080)
	<i>N</i>	71,686	71,686		311,168	311,168	
	<i>R</i> ²	0.0042	0.0030		0.0002	0.0001	
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Affiliated	Update	0.0426	0.0740	0.0314	0.7197	-0.3832	-1.1030
		(0.0136)	(0.0146)	(0.0200)	(0.4834)	(0.4851)	(0.6849)
	Constant	0.0231	0.0807	0.0576	0.0124	0.0972	0.0847
		(0.0167)	(0.0165)	(0.0235)	(0.0138)	(0.0152)	(0.0205)
	<i>N</i>	3,616	3,616		5,070	5,070	
	<i>R</i> ²	0.0026	0.0070		0.0004	0.0001	

TABLE V. Timing of Recommendations**Panel A. Sample Statistics**

	Mean (median) number of days until new recommendation (same stock + analyst)							
	Overall	Conditional on Level of Recommendation				Relative to Update		
		Strong Sell	Sell	Hold	Buy	Strong Buy	Before Increase	Before Decrease
Unaffiliated	323.7 (188)	167.5 (90)	184.1 (105)	340.7 (189)	314.8 (186)	340.1 (211)	309.1 (174)	335.5 (203)
Affiliated (IPO, SEO, co-underwriters)	370.9 (234)	118.0 (57)	82.8 (57)	307.9 (195)	363.7 (235)	431.1 (274)	304.8 (183)	410.2 (269)

Sample Period is 2/01/1994 to 12/31/2002.

Panel B. Regression Analysis

OLS regressions of the days until the next recommendation by the same analyst for the same stock (Columns 1 and 2) and of recommendation level minus consensus (average over the past month, Column 3 and 4) on recommendation and affiliation dummies. The sample excludes reiterations in Columns 1 and 2 and is limited to stocks for which affiliation is possible (IPO in the past 5 years, SEO in the past 2 years, or bond issuance in the past year) in Columns 3 and 4. Standard errors (in parentheses) are robust to arbitrary heteroskedasticity and within-date correlation.

	Days Until Update		Difference to Consensus	
	(1)	(2)	(3)	(4)
Strong Sell, Sell, Hold	320.10 (4.66)	320.13 (4.66)	-0.37 (0.01)	-0.37 (0.01)
Buy	314.84 (4.18)	314.97 (4.18)	0.05 (0.00)	0.05 (0.00)
Strong Buy	340.08 (4.43)	340.12 (4.43)	0.46 (0.01)	0.46 (0.01)
(Strong Sell, Sell, Hold) * (Any Affiliation)	-31.58 (14.06)		0.14 (0.01)	
(Strong Sell, Sell, Hold) * (IPO Affiliation)		-30.79 (33.56)		0.15 (0.03)
(Strong Sell, Sell, Hold) * (SEO Affiliation)		-8.35 (32.51)		0.14 (0.03)
(Strong Sell, Sell, Hold) * (Co-Affiliation)		-37.40 (16.28)		0.13 (0.02)
(Buy) * (Any Affiliation)	48.89 (11.49)		-0.06 (0.01)	
(Buy) * (IPO Affiliation)		16.83 (23.52)		-0.05 (0.01)
(Buy) * (SEO Affiliation)		87.58 (30.08)		-0.01 (0.02)
(Buy) * (Co-Affiliation)		42.96 (13.42)		-0.07 (0.01)
(Strong Buy) * (Any Affiliation)	91.03 (14.36)		-0.13 (0.01)	
(Strong Buy) * (IPO Affiliation)		150.08 (34.46)		-0.15 (0.02)
(Strong Buy) * (SEO Affiliation)		55.91 (29.39)		-0.10 (0.03)
(Strong Buy) * (Co-Affiliation)		77.92 (17.78)		-0.12 (0.01)
Number of Observations	59,229	50,504	50,504	50,504
R ²	0.42	0.42	0.34	0.34

TABLE VI. Timing of Annual Earnings Forecasts**Panel A. Sample Statistics**

	Mean (median) number of days until new forecast (same stock + analyst)					
	Overall	Relative to Consensus			Relative to Update	
		Less than	Equal to	Greater than	Before Increase	Before Decrease
Unaffiliated	63.7 (54)	60.4 (50)	89.6 (76)	65.7 (57)	65.0 (57)	62.6 (52)
Affiliated (IPO, SEO, co-underwriters)	65.2 (56)	60.1 (50)	89.0 (76)	67.5 (59)	64.8 (58)	65.5 (54)

Sample Period is 2/01/1994 to 12/31/2002.

Panel B. Regression Analysis: Days Until Update

OLS regressions of the number of days until the new forecast on dummies for forecasts greater than, equal to, and less than the consensus and for affiliations. Excludes forecasts that are reiterations of the prior forecasts. Standard errors (in parentheses) are robust to arbitrary heteroskedasticity and within-date correlation.

	(1)	(2)
Greater than Consensus	65.75 (0.39)	65.74 (0.39)
Equal to Consensus	89.58 (0.74)	89.55 (0.74)
Less than Consensus	60.36 (0.40)	60.36 (0.40)
(Greater than Consensus)* (Any Affiliation)	1.72 (1.05)	
(Greater than Consensus)* (IPO Affiliation)		3.89 (3.00)
(Greater than Consensus)* (SEO Affiliation)		-2.42 (2.54)
(Greater than Consensus)* (Co-Affiliation)		2.49 (1.23)
(Equal to Consensus)* (Any Affiliation)	-0.56 (3.51)	
(Equal to Consensus)* (IPO Affiliation)		9.42 (6.72)
(Equal to Consensus)* (SEO Affiliation)		-3.08 (9.66)
(Equal to Consensus)* (Co-Affiliation)		-1.74 (4.42)
(Less than Consensus)* (Any Affiliation)	-0.27 (0.93)	
(Less than Consensus)* (IPO Affiliation)		1.07 (2.69)
(Less than Consensus)* (SEO Affiliation)		0.42 (2.35)
(Less than Consensus)* (Co-Affiliation)		-0.85 (1.06)
Number of Observations	324,682	324,682
R ²	0.63	0.63

TABLE VII. Relationship Between Forecast Optimism and Recommendation Optimism

The dependent variable is Annual Forecast Optimism, defined as the difference between forecast and consensus, divided by the stock price on the forecast date. The sample is limited to earnings forecasts within 10-80 days before the earnings announcement and to stocks with prices of at least \$5 and for which affiliation is possible (forecasts made within 2 years of an SEO, 5 years after an IPO or 1 year after a bond issuance). Recommendation Optimism is the difference between a recommendation and the consensus for the same stock (over the past month) at the time of the earnings forecast. Affiliation is a binary variable and equal to 1 if the analyst's brokerage house is affiliated with an investment bank with a past SEO- or IPO- (co- or lead-)underwriting relationship. Standard errors (in parentheses) are robust to heteroskedasticity and arbitrary within-analyst correlation.

Panel A. Prior/Current Recommendation

	Whole Sample	Unaffiliated	Affiliated	Whole Sample
Recommendation Optimism	0.00011 (0.00009)	0.00016 (0.00009)	-0.00136 (0.00076)	0.00016 (0.00009)
Affiliation				-0.00018 (0.00054)
Affiliation*(Recommendation Optimism)				-0.00152 (0.00076)
Constant	-0.00243 (0.00010)	-0.00241 (0.00010)	-0.00260 (0.00054)	-0.00241 (0.00010)
Number of Observations	13,860	13,455	405	13,860
R ²	0.0001	0.0002	0.0111	0.0007

Panel B. Next Recommendation

	Whole Sample	Unaffiliated	Affiliated	Whole Sample
Before Announcement * (Recommendation Optimism)	0.00005 (0.00058)	0.00002 (0.00059)	0.01962 (0.00950)	0.00002 (0.00059)
Before Announcement * Affiliation				-0.00691 (0.00930)
Before Announcement * Affiliation*(Recommendation Optimism)				0.01960 (0.00939)
Before Announcement * Constant	-0.00159 (0.00065)	-0.00154 (0.00064)	-0.00845 (0.00950)	-0.00154 (0.00064)
After Announcement * (Recommendation Optimism)	-0.00029 (0.00015)	-0.00032 (0.00016)	0.00050 (0.00068)	-0.00032 (0.00016)
After Announcement * Affiliation				0.00009 (0.00096)
After Announcement * Affiliation*(Recommendation Optimism)				0.00081 (0.00068)
After Announcement * Constant	-0.00211 (0.00018)	-0.00211 (0.00018)	-0.00202 (0.00096)	-0.00211 (0.00018)
Number of Observations	3,746	3,617	129	3,746
R ²	0.0568	0.0569	0.0940	0.0583

TABLE VIII. Earnings Forecasts: Positive or Negative Forecast Error

Logit model, where the dependent variable takes the value of 1 if the earnings forecast is greater than the earnings realization. The sample is limited to the last forecast of a given analyst for a particular firm's fiscal period. Expected time to annual (quarterly) earnings announcements is based on the dates of the previous year's earnings announcements. The sample period is 02/01/1994 to 12/31/2002 for the "full period" estimations and 02/01/1994 to 7/31/2001 for the "pre-scandal period." Standard errors (in parentheses) are robust to arbitrary heteroskedasticity and within-analyst correlation.

	Full Period		Pre-Scandal Period	
	(1)	(2)	(3)	(4)
Type of Affiliation				
IPO lead-underwriter (past 5 yrs)	-0.3328 (0.1500)	-0.2992 (0.1470)	-0.2567 (0.1595)	-0.2310 (0.1580)
SEO lead-underwriter (past 2 yrs)	0.0715 (0.1112)	0.0773 (0.1115)	-0.0311 (0.1380)	-0.0242 (0.1386)
Co-underwriter	-0.0623 (0.0548)	-0.0530 (0.0542)	-0.1499 (0.0629)	-0.1454 (0.0628)
Future underwriter (next 1 yr.)	-0.0376 (0.1717)	-0.0635 (0.1748)	0.0817 (0.2232)	0.0252 (0.2240)
Bond underwriter (past 1 yr.)	-0.0426 (0.0948)	-0.0452 (0.0963)	-0.0853 (0.1046)	-0.0762 (0.1059)
Never Affiliated (to any firm)	-0.0056 (0.0171)	-0.0086 (0.0173)	-0.0121 (0.0194)	-0.0177 (0.0192)
Expected time to annual earnings announcement [in thousandths]	0.0029 (0.0001)	0.0028 (0.0001)	0.0028 (0.0001)	0.0028 (0.0001)
Expected time to next quarterly announcement [in thousandths]	0.0002 (0.0002)	0.0002 (0.0001)	0.0000 (0.0002)	0.0000 (0.0002)
Forecast optimism relative to consensus, normalized by share price		-0.8862 (0.4293)		-1.6592 (0.9579)
Constant	-0.9403 (0.0165)	-0.9495 (0.0164)	-0.8993 (0.0172)	-0.9086 (0.0178)
Number of Observations	133,952	131,021	107,024	104,744
χ^2	1,413	1,452	1,164	1,160
Pseudo R ²	0.0136	0.0135	0.0131	0.0130

TABLE A1. Sample of Quarterly Earnings Forecasts and Long-Term Growth Forecasts

Quarterly Earnings Forecasts are reported in earnings-per-share dollars, and the sample is limited to forecasts pertaining to the closest following quarterly earnings-per-share announcement occurring during the SEC mandated window of 0-45 days after the end of the relevant fiscal quarter. Long-term Growth Forecasts are the expected annual rate of earnings growth, typically for the next 3-5 years.

Panel A: Entire Sample	Quarterly Earnings Forecasts						Long-Term Growth Forecasts					
	Sample size	Mean	Standard Deviation	Percentile			Sample size	Mean	Standard Deviation	Percentile		
				25th	50th	75th				25th	50th	75th
All	412,447	0.40	0.50	0.17	0.34	0.57	72,665	14.98	8.81	10.00	14.00	18.00
Unaffiliated	403,592	0.40	0.50	0.17	0.34	0.57	71,220	14.94	8.81	10.00	14.00	18.00
Affiliated	8,855	0.40	0.46	0.15	0.32	0.57	1,445	17.17	8.49	12.00	15.00	20.00
IPO lead-underwriting (past 5 years)	696	0.28	0.33	0.12	0.25	0.44	155	20.02	7.64	15.00	20.00	25.00
SEO lead-underwriting (past 2 years)	1,204	0.32	0.30	0.15	0.30	0.46	186	18.68	11.39	12.00	15.00	24.00
Co-underwriting equity ¹	4,485	0.34	0.48	0.12	0.28	0.47	797	18.09	8.14	13.00	17.00	22.00
Future SEO (next 2 years)	745	0.32	0.31	0.14	0.27	0.51	113	19.36	10.77	13.00	17.00	25.00
Bond lead underwriting (past year)	2,494	0.57	0.47	0.26	0.51	0.78	327	13.15	5.60	10.00	13.00	15.00
Never Affiliated ²	156,828	0.41	0.51	0.17	0.35	0.59	29,936	14.42	7.87	10.00	13.00	17.70

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	Quarterly Earnings Per Share						Long-Term Growth Forecasts					
	Sample size	Mean	Standard Deviation	Percentile			Sample size	Mean	Standard Deviation	Percentile		
				25th	50th	75th				25th	50th	75th
All	179,576	0.44	0.46	0.19	0.37	0.63	32,748	15.61	8.47	10.00	14.00	20.00
Unaffiliated	171,019	0.44	0.46	0.19	0.37	0.63	31,341	15.54	8.47	10.00	14.00	20.00
Affiliated ³	8,557	0.40	0.46	0.15	0.32	0.57	1,407	17.14	8.31	12.00	15.00	20.00

Sample period is 2/01/1994 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.

TABLE A2. Comparison to Consensus

OLS regression of the difference between individual analyst forecasts and the consensus normalized by share price. A positive difference indicates that the analyst is optimistic relative to the consensus. The sample is limited to stocks with a share price of at least \$5 and for which affiliation is possible, i.e., stocks with an IPO in the past 5 years, SEO in the past 2 years or bond issuance in the past 1 year. Standard errors (in parentheses) are robust to arbitrary heteroskedasticity and within-date correlation.

	Quarterly Earnings Forecasts (1)	Long-Term Growth Forecasts (2)
Type of Affiliation		
IPO lead-underwriter (past 5 yrs)	-0.0001 (0.0002)	-0.7004 (0.7929)
SEO lead-underwriter (past 2 yrs)	-0.0003 (0.0001)	0.2990 (0.8353)
Co-underwriter	-0.0001 (0.0001)	-0.4606 (0.2615)
Future underwriter (next 1 yr.)	0.0003 (0.0001)	1.4285 (0.8356)
Bond underwriter (past 1 yr.)	0.0001 (0.0000)	-0.0279 (0.2238)
Never Affiliated (to any firm)	0.0000 (0.0000)	-0.1702 (0.0840)
Expected time to annual earnings announcement [in thousandths]		
Expected time to next quarterly announce: [in thousandths]	0.0069 (0.0004)	
Constant	-0.0007 (0.0000)	-0.2659 (0.0645)
Number of Observations	165,134	30,073
R ²	0.0036	0.0004

TABLE A3. Measures of Trade Reaction: Summary Statistics

	Quarterly Earnings Forecast Dates			Long-Term Growth Forecast Dates		
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.
Number of small buy-initiated trades	111.87	47	150.96	104.03	43	145.27
Number of large buy-initiated trades	76.24	23	138.05	73.93	22	133.23
Number of small sell-initiated trades	93.80	42	129.23	87.83	38	124.71
Number of large sell-initiated trades	62.17	19	113.31	60.81	18	110.63
Total number of small buy/sell-initiated trades	205.66	90	275.85	191.86	82	265.76
Total number of large buy/sell-initiated trades	138.42	43	249.61	134.74	41	242.09
Δ (buy-sell) initiated small trades	18.07	5	53.71	16.19	4	51.80
Δ (buy-sell) initiated large trades	14.07	3	38.59	13.12	2	37.04
Dollar value small buy-initiated trades	927,249	396,559	1,250,248	874,644	364,988	1,208,533
Dollar value large buy-initiated trades	21,400,000	4,275,563	55,600,000	20,800,000	4,172,619	52,800,000
Dollar value small sell-initiated trades	779,525	351,566	1,062,852	740,976	330,144	1,029,601
Dollar value large sell-initiated trades	17,800,000	3,609,809	51,200,000	17,400,000	3,501,088	49,900,000
Dollar value total small buy/sell-initiated trades	1,706,774	758,241	2,279,375	1,615,620	707,188	2,203,485
Dollar value total large buy/sell-initiated trades	39,100,000	8,260,322	105,000,000	38,200,000	8,074,275	101,000,000
Dollar value of (buy-sell) small trades	147,724	40,144	435,887	133,667	33,625	431,176
Dollar value of (buy-sell) large trades	3,639,670	269,813	21,700,000	3,453,232	271,575	21,000,000
	<i>N</i>	433,050		71,339		

Sample period is 2/01/1994 through 12/31/2002.

TABLE A4. Trade Reaction: Regression Results

Trade reaction is measured by abnormal trade imbalance. Large traders represent trades of at least \$50,000; small traders represent trades of less than \$20,000. Update is the difference between a given forecast and the prior forecast, normalized by share price for Quarterly Earnings Forecasts (as these are in earnings per share units) and unnormalized for Long-Term Growth Forecasts (as these are in percentage units). Standard errors (in parentheses) are robust to arbitrary heteroskedasticity and within-day correlation.

		Quarterly Earnings Forecasts			Long-Term Growth Forecasts		
		Large Traders	Small Traders	Difference (S-L)	Large Traders	Small Traders	Difference (S-L)
Unaffiliated	Update	1.4210	-0.8837	-2.3047	0.0020	-0.0004	-0.0023
		(0.4858)	(0.5265)	(0.7164)	(0.0007)	(0.0007)	(0.0010)
	Constant	0.0016	0.0614	0.0598	0.0143	0.0498	0.0355
		(0.0064)	(0.0071)	(0.0096)	(0.0072)	(0.0080)	(0.0108)
	<i>N</i>	135,001	135,001		44,868	44,868	
	<i>R</i> ²	0.0002	0.0001		0.0002	0.0000	
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Affiliated	Update	1.0993	1.4729	0.3736	0.0094	0.0036	-0.0058
		(2.4767)	(2.5195)	(3.5329)	(0.0066)	(0.0056)	(0.0086)
	Constant	-0.0350	0.0766	0.1116	0.0087	0.0130	0.0043
		(0.0241)	(0.0253)	(0.0349)	(0.0447)	(0.0407)	(0.0605)
	<i>N</i>	1,777	1,777		564	564	
	<i>R</i> ²	0.0001	0.0002		0.0046	0.0007	

TABLE A5. Persistence of Quarterly Earnings Forecasts**Panel A. Sample Statistics**

	Mean (median) number of days until new forecast (same stock + analyst)					
	Overall	Relative to Consensus			Relative to Update	
		Less than	Equal to	Greater than	Before Increase	Before Decrease
Unaffiliated	39.6 (38)	38.5 (36)	44.5 (47)	39.2 (37)	39.3 (37)	39.7 (39)
Affiliated (IPO, SEO, co-underwriters)	40.2 (41)	39.1 (40)	42.5 (44)	40.2 (38)	41.2 (42)	39.6 (39)

Sample Period is 2/01/1994 to 12/31/2002.

Panel B. Regression Analysis: Days Until Update

All independent variables are binary. Excludes forecasts which are reiterations of the prior forecast for the same stock by the same analyst. Standard errors (in parentheses) are robust to arbitrary heteroskedasticity and within-date correlation.

	(1)	(2)
Greater than Consensus	39.23 (0.30)	39.23 (0.30)
Equal to Consensus	44.50 (0.29)	44.49 (0.29)
Less than Consensus	38.47 (0.33)	38.47 (0.33)
(Greater than Consensus)* (Any Affiliation)	1.04 (1.05)	
(Greater than Consensus)* (IPO Affiliation)		5.95 (3.03)
(Greater than Consensus)* (SEO Affiliation)		-0.35 (2.34)
(Greater than Consensus)* (Co-Affiliation)		0.82 (1.24)
(Equal to Consensus)* (Any Affiliation)	-2.03 (1.53)	
(Equal to Consensus)* (IPO Affiliation)		-0.69 (4.08)
(Equal to Consensus)* (SEO Affiliation)		-0.01 (3.25)
(Equal to Consensus)* (Co-Affiliation)		-2.56 (1.86)
(Less than Consensus)* (Any Affiliation)	0.57 (1.00)	
(Less than Consensus)* (IPO Affiliation)		5.54 (3.17)
(Less than Consensus)* (SEO Affiliation)		-2.26 (2.24)
(Less than Consensus)* (Co-Affiliation)		0.28 (1.16)
Number of Observations	99,012	99,012
R ²	0.74	0.74

TABLE A6. Persistence of Long-Term Growth Forecasts**Panel A. Sample Statistics**

	Mean (median) number of days until new forecast (same stock + analyst)					
	Overall	Relative to Consensus			Relative to Update	
		Less than	Equal to	Greater than	Before Increase	Before Decrease
Unaffiliated	281.3 (151)	283.5 (153)	355.9 (219)	274.1 (146)	272.7 (140)	288.2 (158)
Affiliated (IPO, SEO, co-underwriters)	386.1 (239)	392.2 (250)	565.0 (468)	363.0 (218)	311.6 (195)	430.0 (283)

Sample Period is 2/01/1994 to 12/31/2002.

Panel B. Regression Analysis: Days Until Update

All independent variables are binary. Excludes forecasts that are reiterations of the prior forecasts for a given stock by the same analyst. Standard errors (in parentheses) are robust to arbitrary heteroskedasticity and within-date correlation.

	(1)	(2)
Greater than Consensus	274.11 (4.63)	274.12 (4.63)
Equal to Consensus	355.89 (11.93)	355.89 (11.93)
Less than Consensus	283.50 (4.63)	283.60 (4.64)
(Greater than Consensus)* (Any Affiliation)	88.92 (27.30)	
(Greater than Consensus)* (IPO Affiliation)		-7.50 (50.90)
(Greater than Consensus)* (SEO Affiliation)		64.62 (45.83)
(Greater than Consensus)* (Co-Affiliation)		106.81 (35.61)
(Equal to Consensus)* (Any Affiliation)	209.11 (113.68)	
(Equal to Consensus)* (IPO Affiliation)		203.11 (11.93)
(Equal to Consensus)* (SEO Affiliation)		275.11 (11.93)
(Equal to Consensus)* (Co-Affiliation)		205.58 (126.89)
(Less than Consensus)* (Any Affiliation)	108.70 (22.95)	
(Less than Consensus)* (IPO Affiliation)		165.87 (78.97)
(Less than Consensus)* (SEO Affiliation)		127.88 (57.13)
(Less than Consensus)* (Co-Affiliation)		77.47 (22.17)
Number of Observations	42,709	42,709
R ²	0.39	0.39

TABLE A7. Relationship Between Quarterly Earnings Forecast Optimism and Recommendation Optimism

The dependent variable is Quarterly Forecast Optimism, defined as the difference between forecast and consensus, divided by the stock price on the forecast date. The sample is limited to forecasts made within the last 10 to 80 days before the announcement and to stocks with a price of at least \$5 and for which affiliation is possible, i.e., within 5 years after an IPO, 2 years after an SEO, or 1 year after a bond issuance. Recommendation Optimism is the difference between an analyst's outstanding recommendation for a given stock minus the consensus (over the past month) at the time of the earnings forecast. Affiliation is an indicator variable equal to 1 if the analyst's brokerage house belongs to an investment bank with a past SEO- or IPO- (co- or lead-)underwriting relationship. Standard errors (in parentheses) are robust to heteroskedasticity and arbitrary within-analyst correlation.

Panel A. Prior/Current Recommendation

	Whole Sample	Unaffiliated	Affiliated	Whole Sample
Recommendation Optimism	0.00004 (0.00003)	0.00005 (0.00003)	-0.00017 (0.00015)	0.00005 (0.00003)
Affiliation				-0.00036 (0.00017)
Affiliation*(Recommendation Optimism)				-0.00022 (0.00016)
Constant	-0.00051 (0.00003)	-0.00050 (0.00003)	-0.00086 (0.00017)	-0.00050 (0.00003)
Number of Observations	60,130	58,477	1,653	60,130
R ²	0.0001	0.0001	0.0008	0.0004

Panel B. Next Recommendation

	Whole Sample	Unaffiliated	Affiliated	Whole Sample
Before Announcement * (Recommendation Optimism)	-0.00014 (0.00011)	-0.00015 (0.00011)	0.00031 (0.00025)	-0.00015 (0.00011)
Before Announcement * Affiliation				0.00013 (0.00038)
Before Announcement * Affiliation * (Recommendation Optimism)				0.00046 (0.00027)
Before Announcement * Constant	-0.00069 (0.00010)	-0.00069 (0.00010)	-0.00056 (0.00036)	-0.00069 (0.00010)
After Announcement * (Recommendation Optimism)	-0.00003 (0.00002)	-0.00004 (0.00002)	0.00007 (0.00011)	-0.00004 (0.00002)
After Announcement * Affiliation				-0.00037 (0.00020)
After Announcement * Affiliation * (Recommendation Optimism)				0.00011 (0.00011)
After Announcement * Constant	-0.00036 (0.00004)	-0.00035 (0.00004)	-0.00072 (0.00020)	-0.00035 (0.00004)
Number of Observations	16,768	16,230	538	16,768
R ²	0.0103	0.0100	0.0304	0.0107

TABLE A8. Relationship Between Optimism in Long Term Growth Forecasts and in Recommendations

The dependent variable is Long-Term Growth Forecast Optimism, defined as the difference between forecast and consensus (over the past 6 months). The sample is limited to stocks for which affiliation is possible, i.e., within 5 years of an IPO, 2 years after an SEO, or 1 year after a bond issuance. Recommendation Optimism is the difference between a recommendation and the consensus for the same stock (over the past month) at the time of the earnings forecast. Affiliation is a binary variable, equal to 1 if the analyst's brokerage house belongs to an investment bank with a past SEO- or IPO- (co- or lead-)underwriting relationship. Standard errors (in parentheses) are robust to heteroskedasticity and arbitrary within-analyst correlation.

Panel A. Prior/Current Recommendation

	Whole Sample	Affiliated	Unaffiliated	Whole Sample
Recommendation Optimism	0.48424 (0.05336)	0.71719 (0.36235)	0.48037 (0.05405)	0.48037 (0.05405)
Affiliation				-0.18064 (0.37113)
Affiliation*(Recommendation Optimism)				0.23682 (0.36658)
Constant	-0.38545 (0.07812)	-0.56261 (0.36356)	-0.38198 (0.07944)	-0.38198 (0.07945)
Number of Observations	19,433	445	18,988	19,433
R ²	0.0046	0.0071	0.0046	0.0047

Panel B. Next Recommendation

	Whole Sample	Affiliated	Unaffiliated	Whole Sample
Recommendation Optimism	0.11472 (0.11053)	0.32337 (0.42384)	0.10902 (0.11294)	0.10902 (0.11296)
Affiliation				0.48603 (0.59484)
Affiliation*(Recommendation Optimism)				0.21435 (0.43572)
Constant	0.01138 (0.12191)	0.48569 (0.58742)	-0.00034 (0.12406)	-0.00034 (0.12408)
Number of Observations	5,306	125	5,181	5,306
R ²	0.0004	0.0035	0.0003	0.0005