NBER WORKING PAPER SERIES

DO SECURITY ANALYSTS SPEAK IN TWO TONGUES?

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Working Paper 13124
http://www.nber.org/papers/w13124

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
May 2007

We would like to thank Sris Chatterjee, Paul Healy, David Hirshleifer, Gerard Hoberg, Jennifer Juergens, Charles Lee, Pat O'Brien, Tim McCormick, Zoran Ivkovich, Siew Hong Teoh, seminar participants at the MIT Sloan School of Management, UC Irvine, the Securities and Exchange Commission, the N.Y. Fed/Ohio State University/JFE 2004 conference on Agency Problems and Conflicts of Interest in Financial Intermediaries, the 2005 Early Career Women in Finance Mini-Conference, the 2006 American Finance Association Annual Meeting, the 2006 Financial Accounting and Reporting Section Mid-Year Meeting of the AAA, the 2006 Financial Management Association Europe Conference, the Seventh Maryland Finance Symposium on Behavioral Finance, the 2007 European Accounting Association Annual Meeting and the University of Minnesota. Michael Jung provided excellent research assistance. Ulrike Malmendier gratefully acknowledges financial support from the Coleman Fung Risk Management Research Center. Send correspondence to Devin Shanthikumar. The views expressed herein are those of the author(s) and do not necessarily reflect the views of the National Bureau of Economic Research.

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NBER Working Paper No. 13124
May 2007, Revised February 2014
JEL No. D14,D82,G12,G14,G24

ABSTRACT

Why do security analysts issue overly positive recommendations? We propose a novel approach to distinguish strategic motives (e.g., generating small-investor purchases and pleasing management) from nonstrategic motives (genuine overoptimism). We argue that nonstrategic distorters tend to issue both positive recommendations and optimistic forecasts, while strategic distorters "speak in two tongues," issuing overly positive recommendations but less optimistic forecasts. We show that the incidence of strategic distortion is large and systematically related to proxies for incentive misalignment. Our "two-tongues metric" reveals strategic distortion beyond those indicators and provides a new tool for detecting incentives to distort that are hard to identify otherwise.

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A large body of research shows that analyst recommendations are positively biased.[1] The explanations for the upward bias fall into two categories, "strategic" and "nonstrategic." Strategic distortion reflects misaligned incentives: analysts aim to please company management, generate corporate finance business, and induce investors to purchase stock.[2] Nonstrategic distortion reflects genuine overoptimism: analysts have too-positive expectations, for example, due to self-selection into covering stocks they view favorably, or due to credulity (McNichols and O'Brien 1997; Teoh and Wong 2002).[3] Despite the policy relevance of this distinction, especially for reducing analyst distortion, we know little about the relative importance of strategic and nonstrategic motives. Analysts' affiliation with stock underwriters and other measures of incentive misalignment are often interpreted as proxies for strategic distortion, but they are open to alternative interpretations. For example, the higher incidence of positive recommendations among affiliated analysts could reflect that an analyst's genuine overoptimism encourages the corporate-finance division to underwrite in the first place.[4]

In this paper, we propose a novel approach to distinguish strategic and nonstrategic bias. We exploit the fact that strategic distorters have stronger incentives to distort their recommendations than their forecasts. We construct a novel "two-tongues metric" of strategic distortion, issuing optimistic recommendations but less optimistic or even pessimistic forecasts. We find that a large number of analysts distort strategically.

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[1] Michaely and Womack (2005) provide an excellent recent review of the recommendations literature.

[2] See Michaely and Womack (1999). Management often calls analysts to complain about low ratings, and has "frozen out" the analysts who gave them (Francis, Hanna, and Philbrick 1997; Chen and Matsumoto 2006), while buy-side clients push for positive recommendations on stocks they hold (Boni and Womack 2002).

[3] Lin and McNichols (1998) use the terminology "strategic and non-strategic bias" more narrowly to capture whether distortion is aimed at being selected as an underwriter or not. Kothari (2001) uses "incentives-based versus cognitive" to capture the same distinction we make.

[4] Relatedly, Bradley, Jordan, and Ritter (2003) and Ljungqvist, Marston, and Wilhelm (2006) show that analysts fail to win underwriting business with positive recommendations.

We relate our metric to existing measures of incentive (mis-)alignment used in prior work (Ljungqvist et al. 2007 and Ljungqvist, Marston, and Wilhelm 2006). We show that affiliation and investment-banking pressure (share of a company's previous underwriting mandate) are highly predictive of strategic distortion, but other measures are not, including bank reputation capital, bank loyalty index, institutional ownership, and all-star status. As such, our results speak to the interpretation and relative strength of the existing indicators of distortion. Our measure detects widespread and persistent strategic distortion beyond that captured by existing proxies.

Our empirical strategy consists of four steps. First, using Institutional Brokers' Estimate System (IBES) data, we compare the average distortion of recommendations and annual earnings forecasts.[5] Consistent with prior studies (e.g., Lin and McNichols 1998; Michaely and Womack 1999), we find that recommendations are tilted toward buys and strong buys, in particular if analysts are affiliated with a stock's underwriter. Annual earnings forecasts, instead, often underestimate the subsequent earnings, and affiliated forecasts are *less* positive than unaffiliated ones.[6] We also find recommendation timing to be as in O'Brien, McNichols, and Lin (2005): affiliated analysts are slower to downgrade stocks from "buy" or "strong buy" than unaffiliated analysts. Going beyond prior findings, we extend the timing analysis to forecasts and find no differential timing of affiliated and unaffiliated forecasts. Sampling by other incentive measures reveals similar contrasts.

Second, we relate distortion to investor behavior. Using New York Stock Exchange Trades and Quotations (TAQ) data, we show that small and large investors react

[5] Quarterly earnings forecasts and long-term growth forecasts are discussed in the Online Appendix.
[6] Lin and McNichols (1998) find no difference for SEO-affiliated analysts (in 1989–1994). Our different finding might reflect our longer post-IPO/SEO window and the different sample period (1993–2008).

differently to recommendations and forecasts. Large investors correct for the upward distortion of recommendations while small investors do not, consistent with Iskoz (2002), Malmendier and Shanthikumar (2007), and Mikhail, Walther, and Willis (2007). We present the new finding that small investors exert buy pressure in response to forecast updates regardless of whether they convey good or bad news. Large investors, instead, respond to the direction of the update, exerting buy (sell) pressure after positive (negative) updates.[7] Moreover, small investors react more strongly than large investors to whether firms "meet or beat" last year's earnings, but neglect the earnings surprise magnitude.

The differences in small and large investors' trade reactions generate incentives to distort recommendations upward, but not forecasts. Biased recommendations induce small investors to trade, and this distortion comes at little cost vis-à-vis large investors, who correct for the distortion. Biased forecasts, however, entail little benefit in terms of small-investor reaction and come at a higher cost of tarnishing reputation with large investors. Management pressures reinforce these incentives. While managers like to see optimistic recommendations, they tend to "guide" analysts to lower forecasts shortly before the earnings announcement, allowing their firm to "meet or beat" the consensus.[8]

For both reasons, *strategic* distortion should be more positive for recommendations than forecasts. Under *nonstrategic* distortion, instead, the most optimistic analysts issue the most optimistic recommendations *and* the most optimistic forecasts. For example, if analysts believe that the next earnings will be higher than the consensus, they

[7] The results add a directional (buy/sell) dimension to Mikhail, Walther, and Willis (2007), who find that small trade volume does not vary with the absolute magnitude of forecast updates, while large trade volume increases.

[8] Richardson, Teoh, and Wysocki (2004) document the within-year "walk-down" in forecasts. Chan, Karceski, and Lakonishok (2007) argue that analysts strategically lower earnings forecasts so that firms avoid negative earnings surprises. Baik and Yi (2007) document that firms meet or beat the forecasts of affiliated analysts more often than those of unaffiliated analysts, consistent with our own results.

should issue a “buy,” given the excess returns associated with positive earnings surprises.

In the third step, therefore, we relate forecast optimism to recommendation optimism and examine how the relationship varies with respect to analyst incentives. We restrict the primary analysis to recommendations issued by the same analyst for the same stock on the same day as the forecast. In order to minimize concerns about unobserved factors affecting the estimation, we restrict the analysis to analysts who are both affiliated and unaffiliated and to stocks with recent issuance (so affiliation is possible), and conduct reweighting and fixed effect analyses. We find that unaffiliated analysts who are more optimistic in their recommendations tend to be insignificantly more optimistic in their forecasts. Affiliated analysts, however, who are optimistic in their recommendations are significantly more *pessimistic* in their forecasts. Investment-banking pressure predicts the same strategic distortion, but bank reputation, institutional ownership, and all-star status do not. Our “two-tongues metric” also reveals that bank loyalty predicts a pessimistic forecast paired with an optimistic recommendation with marginal significance; that is, a higher frequency of retaining clients appears not to lower distortion in our sample.

Fourth, we use the difference between recommendation and forecast optimism to construct a measure of strategic distortion, the “two-tongues metric.” The measure reveals widespread strategic distortion, among more than half of all analysts. It also reveals that past distortion predicts future distortion. An analyst who has distorted investment advice for a stock strategically will do so again at the next instance with 62% probability, while one who did not has only 49% probability of doing so at the next instance. This holds both for affiliated and unaffiliated analysts. These differences are even more striking when we account for strategic distortions “implicit” in the above-mentioned strategic timing, that is, the delay of recommendation downgrades. If we include outstanding rec-

ommendations in instances where a forecast but no new recommendation is issued, the same-stock persistence of strategic distorters is 75%, while only 34% of nonstrategic distorters will start strategically distorting.

The results suggest that strategic motives are more widespread and persistent than is detectable with the leading proxies of incentive misalignment. Our "two-tongues metric" reveals, for example, that an unaffiliated analyst who has distorted strategically in the past is indistinguishable from an affiliated analyst who has distorted strategically in the past—their probabilities of future distortion are high and virtually identical.

Our finding that a large fraction of analysts speak in "different tongues" to different audiences is important not only in light of the large role that security analysts play in financial markets, but also because individual investors increasingly manage their investments and retirement savings on their own.[9] A growing literature in household finance is concerned with their biases and suboptimal decision-making (Choi, Laibson, and Madrian 2010; Choi et al. 2009; Lusardi and Mitchell 2007; Malmendier and Nagel 2011). Our results imply that precisely this group of investors receives the least reliable investment advice. Mandatory separation of research and investment banking might reduce strategic upward distortions, but the incentive to communicate differently toward distinct groups of investors will remain.

This paper builds upon a large literature on analyst behavior.[10] Several papers analyze whether conflicts of interest explain the upward distortion of affiliated recommen-

[9] The Federal Reserve's triennial Survey of Consumer Finances found that in 1989 fewer than one-third of households had stock holdings, while in each of the surveys after 2000, over 50% of households had stock holdings. Similarly, in 1989 only 37% of households had one or more retirement accounts (such as an IRA or 401(k) account), while in 2001 the number was 52.6%.

[10] In addition to the literature cited above, important recent examples are Abarbanell and Lehavy (2003), Barber et al. (2006), and Barber, Lehavy, and Trueman (2007).

dations, with mixed results. McNichols and O'Brien (1997) argue that analysts choose to cover firms about which they are genuinely optimistic. Kolasinski and Kothari (2008) provide evidence of strategic distortion by analysts affiliated with acquirers or targets around mergers. Cowen, Groysberg, and Healy (2006) argue that trade generation, not underwriting, drives upward distortion. Groysberg et al. (2013) find that buy-side analysts, with different incentives, are less optimistic than the sell-side. Our paper does not aim at distinguishing the different strategic motives. Rather, we complement prior work by jointly examining recommendations and forecasts to assess strategic distortion directly.[11]

The hypothesis of this paper, that analysts use recommendations and earnings forecasts differently and communicate to different classes of investors "in two tongues," is new to the literature, as is the empirical evidence of widespread (identifiably) *strategic* distortion not captured by previous proxies. As such, many of our tests are unique. Prior literature does not examine within-analyst correlation of optimism in recommendations and earnings forecasts, nor the effect of underwriting affiliation and other incentive proxies on earnings forecasts issued just before an announcement.

The remainder of the paper is organized as follows. Section 1 presents the data. In Section 2, we show aggregate differences in recommendation and forecast optimism. Section 3 presents the trade reaction and walk-down results that motivate the "two-tongues metric." Section 4 presents the individual-level analysis of recommendation and forecast optimism. Section 5 constructs the "two-tongues metric" to detect strategic dis-

[11] Few papers have examined recommendations and forecasts together. Two exceptions are Ertimur, Sunder, and Sunder (2007) and Loh and Mian (2006). Both show that analysts who issue more accurate forecasts also issue more profitable recommendations, supporting our hypothesis that genuinely optimistic analysts will reveal optimism in both forecasts and recommendations. Neither examines optimism and pessimism.

tortion ("forensic accounting") and evaluate its prevalence and persistence. Section 6 concludes.

1. Data and Measures

1.1 Analyst data

We obtain analyst recommendations, annual earnings forecasts, earnings realizations, and information about analyst identities and brokerage firms from IBES. We include all U.S. firms with Center for Research in Security Prices (CRSP) data. Thus our main sample includes the three major exchanges, NYSE, Amex, and Nasdaq.[12] Recommendations are available starting from 10/29/1993. We choose 2/1/1994 as the start date because the first three months of IBES data contain an unusually high number of recommendations, creating concerns about data consistency. We use the *revdat* variable to identify all outstanding recommendations and forecasts.[13] IBES converts the recommendation formats of different brokerage houses into a uniform numerical format. Like Jegadeesh et al. (2004), we reverse the coding to 5 = strong buy, 4 = buy, 3 = hold, 2 = sell, and 1 = strong sell, so that a "higher" recommendation is better.

We use annual earnings forecasts occurring between the prior announcement and the announcement to which the forecast relates. We eliminate forecasts relating to announcements that occur outside of the SEC-mandated reporting window of 0–90 days af-

[12] The sample (restricted to forecasts with a well-defined consensus of at least three analysts covering the firm) is dominated by over 60% NYSE stock, while less than 2% is from Amex and 38% is from Nasdaq. The Nasdaq portion increases when we restrict to forecast-recommendation pairs issued on the same day (50%, 2%, 48%, respectively), and increases even further for the Regression Sample, defined in Section 2 (37%, 1.3%, 62%).

[13] *Revdat* is the most recent date on which IBES confirmed the accuracy and validity of an outstanding forecast or recommendation and, hence, provides a floor for how long a forecast or recommendation was valid. We follow IBES in assuming that, if there was no prior "stop" notice or update, a forecast or recommendation is valid for 180 days after the last *revdat*. In cases where an analyst reports two forecasts for the same stock on the same day, *revdat*s can also be used to identify which one is the "correct" forecast.

ter the end of the fiscal year.[14] In order to avoid imprecision arising from IBES's rounding of forecasts, we use the unadjusted data and split-adjust manually.[15]

IBES reports recommendations and earnings forecasts in separate files. To match a given analyst's recommendations and earnings forecasts, we use the analyst identity files of each data set, which maps from numeric analyst identification codes to names. Since IBES acknowledges deviations between the "amaskcd" variable in the recommendations file and the "analyst" variable in the forecasts file, we complement the numeric match with programmed and hand matching of names. For most of our analyses, we limit the sample to forecasts with an identified analyst, eliminating 1.4% of forecasts.

Distortion benchmarks. We measure "optimism" as the difference between a forecast or recommendation and the existing consensus. Since forecasts are in earnings-per-share (dollars), we normalize the difference by the prior-day share price, and we take the average of all outstanding forecasts to calculate the consensus. For recommendations, the calculation is similar. Since recommendations do not apply to a specific time period and are updated less frequently than forecasts, we use a range of periods to form the consensus: either the prior one, two, six, or twelve months. (We show one-month results. Our results are robust to these variations.) We require at least three outstanding forecasts or recommendations, respectively, and a share price of at least $5.00. Both consensus calcu-

[14] Sections 13 and 15(d) of the Exchange Act require publicly traded firms to file 10-Ks within that window (see also Rule 13a-1 and Rule 13a-13). Reports outside the window are in part IBES reporting errors and in part late filers. Allowing for longer windows does not affect our results. When we use 0–105 days (to account for late filers who submit Form NT and obtain a 15-day extension), or even for 0–180 days (as an upper bound to include possible late filers, but not reporting errors), the magnitude and significance of all results remain very similar. For example, the coefficients (s.e.) on Affiliation*(Recommendation Optimism) in Table 5, column 1, are –0.6270 (.3519) using the 90-day cutoff, –0.6265 (.3503) using the 105-day cutoff, and –0.6226 (.3496) using the 180-day cutoff, all significant at the 5% level.

[15] Payne and Thomas (2003) document that using IBES split-adjusted summary data, which is rounded to two decimal places, can have a significant effect on empirical estimates. Using the detailed IBES forecast file, which is rounded to four decimal places (see, for example, Loh and Mian 2006), ameliorates the problem, but similar issues may still arise. Manual adjustment remedies these problems.

lations closely resemble those made in practice, for example, by IBES or Yahoo! Finance.[16]

In our analysis, we construct a "two-tongues metric" of strategic distortion and relate it to the main determinants of analyst behavior identified in prior literature. These determinants, whose construction is described in the Data Appendix, are as follows:

Affiliation. The main determinant of distortion from previous literature is an indicator variable that is equal to 1 if the analyst's investment bank was the lead or co-underwriter of an initial public offering (IPO) of the covered firm during the past five years, or of a seasoned equity offering (SEO) during the past two.

Investment-Banking Pressure. A second known determinant of analyst behavior and, in a broad sense, a continuous version of the binary affiliation proxy is investment-banking pressure. It uses the bank's share of a company's previous underwriting mandate to measure the strength of the bank's relationship with a particular company.

Bank Reputation Capital. Ljungqvist, Marston, and Wilhelm (2006) and Ljungqvist et al. (2007) argue that highly reputable underwriters who dominate the issuance market have lower incentives to seek deals via biased research. Reputational capital is measured as a bank's share in the underwriting market.

Bank Loyalty Index. Another predictor of less underwriting pressure, introduced by Ljungqvist, Marston, and Wilhelm (2006) and Ljungqvist et al. (2007), is the bank loyalty index. It measures to what extent a bank retains its clients in consecutive deals. Like the investment-banking pressure variable, the loyalty index ranges from 0 to 1.

[16] We reestimate results using the median, instead of average, to calculate consensus. Results are virtually identical for Tables 1–4 and similar for Tables 5–7, though the statistical significance decreases. The one exception is the coefficient on Bank Loyalty Index in Table 7 in the full sample, which becomes insignificant.

Institutional Ownership. Another potential determinant of strategic distortion is the presence of institutional investors. Institutional investors publicize their assessment of analysts' performance in rankings such as the annual "All-Star Analyst" list of the *Institutional Investor Magazine*. The quality of the information provided by analysts also affects which brokerage firm institutional investors choose. Hence, out of career concerns, analysts might distort less when stocks have institutional ownership. Ljungqvist et al. (2007) find a significantly negative relationship between analysts' recommendation optimism and the percentage of stock owned by institutions. We examine whether institutional ownership affects *strategic* distortion as evidenced by "speaking in two tongues."

All-Star Status. Relatedly, we control for analysts making the "All-Star Analyst." While institutional investors' rankings affect analysts' reputations and careers, their influence on the distortive behavior of analysts who are already "stars" is unclear.

1.2 Trading data

Trading data are from the NYSE Trades and Quotations (TAQ) database. We examine trading of ordinary common shares for U.S. firms traded on the NYSE.[17]

Investor type. We separate small and large investors by trading size, following Lee and Radhakrishna (2000), with trades up to $20,000 (above $50,000) classified as small (large). As discussed in the Data Appendix, these proxies are effective measures of individual and institutional trade until about 2000 (Malmendier and Shanthikumar 2007). Thus, we limit this portion of the (ancillary) analysis to 1993 through 2002.

[17] The TAQ database reports every round-lot trade and quote from January 1, 1993, onward on the NYSE, Amex, and Nasdaq. We restrict the trade-reaction analysis to NYSE data following Lee and Radhakrishna (2000) and Odders-White (2000), among others, as the Lee-Ready algorithm has only been tested on NYSE data. Battalio and Mendenhall (2005) show that the use of TAQ data for Nasdaq requires a very different approach to calculating cutoffs, and they restrict the analysis to one exchange, given the different market microstructures. The inclusion of Amex has little effect due to the small sample size (<2%, as discussed above).

Trade reaction. We use measures of "directional trade reaction" to capture buy and sell pressure, using the Odders-White (2000) algorithm to determine whether the buyer or seller initiated the trade (see Data Appendix for details). The raw trade imbalance is

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

for firm *i*, investor type *x*, and date *t*. We normalize by subtracting the firm–investor type specific mean of *TI* within the year surrounding *t*, and dividing by its standard deviation.[18] These normalizations allow us to compare trading across small and large investors, and replace year and firm fixed effects in the regression framework.

2. Recommendations versus Forecasts: Aggregate Analysis

We start our empirical analysis by evaluating the aggregate distortions of recommendations and forecasts. Table 1, Panel A, shows the summary statistics of consensus-adjusted recommendations and forecasts ("Optimism") in the IBES-SDC merged data set.

In the full sample, mean Recommendation Optimism is slightly negative, –.002. When we split by the leading proxy for incentive misalignment, affiliation, the mean is negative for unaffiliated analysts (–.004), and positive for affiliated analysts (+.010). The difference is highly statistically significant. While only a small fraction of recommendations are negative (7% "sells" or "strong sells"), the proportion is even lower for affiliated analysts (4%), and the proportion of "buy" and "strong buy" recommendations is higher (63%, compared with 54% for unaffiliated analysts). The mean affiliated recommendation, 3.86, is significantly higher than the mean unaffiliated recommendation, 3.67

[18] See Shanthikumar (2012), and the measures in Lee (1992) and Hvidkjaer (2006).

($p << 0.01$), consistent with prior literature (e.g., Lin and McNichols 1998).

Turning to annual earnings forecasts, on the right half of the table, we observe a reversal: Forecast Optimism among unaffiliated analysts is insignificantly higher (less negative) than among affiliated analysts, –.165 versus –.196 ($p = .17$).

In our main analysis, it will be crucial to ascertain that these aggregate differences do not simply reflect differences in the type of analyst issuing (optimistic) recommendations versus (pessimistic) forecasts, differences in the type of stock for which recommendations and forecasts are issued, or differences in the timing and frequency of recommendations and forecasts. We will need to distinguish differences in behavior due to incentive misalignment from differences due to other analyst characteristics, such as ability of the analyst or type of stock. We address these concerns by restricting the sample to a more homogeneous set of stocks and analysts. We include only (i) analysts who are both affiliated (in some stocks) and unaffiliated (in some other stocks), (ii) firms for which affiliation is possible, with an IPO during the last five years or SEO during the last two years, and (iii) recommendations and forecasts that are issued simultaneously (on the same day) by the same analyst. We denote this sample as the Regression Sample.

The lower half of Table 1, Panel A, shows summary statistics for the Regression Sample. As in the full sample, affiliated analysts are more optimistic in their recommendations but more pessimistic in their forecasts. Here the difference in forecast optimism is marginally significant with a *p*-value of 0.06. The same pattern emerges if we evaluate the differences between affiliated and unaffiliated analysts in a regression framework, controlling for year, month, and day-of-week fixed effects, apply various methods of clustering standard errors (by date, by analyst, and by broker, or two-dimensional clustering by broker and date), and split by pre- and post-scandal period (with a cutoff on

8/1/2001)[19] and by stock exchange (NYSE versus other exchanges). For all of these variations, affiliation is a strongly significant predictor of recommendation optimism, but not of forecast optimism. For forecasts, affiliation is a significantly negative predictor of optimism about NYSE stocks in the pre-scandal period and otherwise insignificantly negative. The results are also robust to controlling for the time until the next earnings announcement (to control for the "walk-down" pattern) and for heterogeneity in the firms covered by affiliated and unaffiliated analysts by calculating weighted averages.[20]

These statistics and regressions suggest that affiliated analysts bias their recommendations but not their forecasts. This discrepancy is hard to reconcile with nonstrategic distortion. While recommendation optimism is open to nonstrategic interpretations (selection bias, genuine overoptimism), only strategic behavior can easily explain why persistently optimistic beliefs about a stock's returns over the next months would not reflect more positive beliefs about its earnings. Our main analysis will test whether the discrepancy persists when directly linking an analyst's forecast and recommendation.

We will also relate distortive behavior to other known determinants of incentive misalignment. The summary statistics are at the bottom of Table 1, Panel A. (For brevity, we show only the Regression Sample. All patterns are similar in the full sample.) For investment-banking pressure, we find the same pattern as for affiliation: recommendation optimism is significantly higher ($p << 0.01$), while forecast optimism is significantly

[19] The date marks the point in time when media coverage of analysts' conflicts of interest skyrocketed after Merrill Lynch settled a suit against the high-profile analyst Henry Blodget and additional suits were filed against Morgan Stanley's "star technology analyst" Mary Meeker (*Financial Times*, 2001).

[20] We weight recommendations and forecasts such that the sum of weights for affiliated analysts for a given firm equals the sum of weights for unaffiliated analysts for the same firm. This effectively equalizes the mix of firms in each sample. The weighted averages of recommendation optimism are –0.015 and 0.027 for unaffiliated and affiliated analysts respectively, and differ significantly at the 1% level ($p = 0.00$). For earnings forecast optimism, the weighted averages are –0.335 and –0.563, but the difference between the two is not statistically significant with weighting to control for mix effects.

lower (p = 0.01). The magnitudes are quite similar to the affiliation subsamples. The other four variables display a mixed pattern. Both recommendation and forecast optimism are higher among analysts whose bank has reputational capital, and thus do not appear to be strategic. The same is true for the bank loyalty index and institutional ownership, though with the reverse sign. Finally, all-star analysts are less optimistic in their recommendations but more optimistic in their forecasts.

These aggregate statistics preview our findings: affiliation and investment-banking pressure are found to be significantly related to "speaking in two tongues," reputational capital predicts less two-tongues behavior, and other measures are not consistent predictors of (less) strategic distortion.

2.1 Differences in timing

As a second preliminary step, we consider the timing of recommendations and forecasts. O'Brien, McNichols, and Lin (2005) find that affiliated analysts are significantly faster than unaffiliated analysts to upgrade holds and downgrade buy or strong buy recommendations in their first update after a stock issuance. The differential timing could be strategic, reflecting incentives to move to more optimistic recommendations; or it could be nonstrategic, reflecting optimistic beliefs or better access to positive information. In this case, forecast updating should exhibit a similar pattern.

In Table 2, we replicate the recommendation timing result and test whether it applies to earnings forecasts. Panel A shows that affiliated analysts are faster than unaffiliated analysts to update negative recommendations, but slower to update positive ones. For example, they maintain strong sell recommendations for 24 days fewer but strong buy recommendations for 40 days more than unaffiliated analysts. The regression analy-

sis in Panel B, Column 1, confirms this pattern. The estimated coefficients indicate that affiliated analysts wait 36 days longer than unaffiliated analysts before changing a strong buy or buy. Even hold recommendations are held for 12 more days (with $p = 0.011$). For strong sell and sell recommendations, we estimate a negative coefficient (–14 days), which is insignificant ($p = 0.158$), also reflecting low power due to the scarcity of negative recommendations. All significance levels are robust to alternate double clustering.

Column 2 of Panel B addresses a subtle dimension of recommendation timing. Regressing the difference to the consensus on the level of recommendation, we find that strong buy and buy (strong sell, sell, and hold) recommendations of affiliated analysts are significantly less likely to be above (below) the consensus at the time of issuance. Affiliated analysts wait until the consensus is high to issue a positive recommendation, possibly to avoid "standing out," but then hold those positive recommendations for longer.

For earnings forecasts we find a different pattern. Affiliated analysts update at almost exactly the same speed as unaffiliated analysts. As shown in Panel A, the differences between affiliated and unaffiliated forecast timing are less than a day for below- and above-consensus forecasts, and only 3.5 days for equal-to-consensus updates. The regression analysis in Column 3 of Panel B shows that none of these differences is statistically significant. While the similarity in forecast updating speed is partly shaped by the quarterly schedule of earnings releases, affiliated analysts could exploit more of the 90-day interval between quarterly announcements, but choose not to do so.

We also analyze the relationship between the timing of recommendations and forecasts and the other determinants of analyst behavior. As expected, investment-banking pressure displays the exact same pattern as affiliation. For the other variables (bank reputation capital, bank loyalty index, institutional ownership, and all-star status),

the pattern is mixed. For example, analysts are slow to update their forecasts for stocks with high institutional ownership both when their forecast is above the consensus and when it is below. Analysts with high bank reputation capital or a high bank loyalty index hold on to negative or neutral recommendations significantly longer than other analysts.

Overall, the timing pattern of recommendations, on the one hand, and the lack thereof for forecasts, on the other hand, suggests strategic behavior among affiliated analysts who are subject to investment-banking pressure.

3. Incentives to "Speak in Two Tongues"

3.1 Investor trade reaction

What explains the differential recommendation/forecast optimism pattern? One potential driver for incentives to "speak in two tongues" is differential trade reaction. If small traders react more strongly to recommendations (while large traders adjust for distortions) and large traders react more strongly to forecasts, strategic distorters should bias recommendations more than forecasts. In this section we test whether this is the case.

The summary statistics for small and large trade reactions are in Table 1, Panel B. As before, we restrict the analysis to recent equity issuers. In the "all dates" sample, small investors initiate more than twice as many trades as large investors; on recommendation dates they initiate 66% more trades (on earnings-forecast dates 49% more). Both groups increase their buy and sell pressure on recommendation and earnings-forecast dates relative to other dates. All results are similar, whether expressed in dollars or number of trades.

Table 3, Panel A, displays trade reactions to updates of recommendations and earnings forecasts, measured as the sum of abnormal trade imbalances over trading days

0 and 1. We focus on the leading proxy for distortion, affiliation, but also discuss the analogous estimation results for the other determinants of analyst behavior.

Columns 1–3 show that both small and large traders react significantly in the direction of recommendation updates: they exert more buy pressure when an analyst increases a recommendation. However, the coefficient in the small-trader sample is higher for affiliated than for unaffiliated updates, while the reverse is true for large traders. As a result, there is no (economically or statistically) significant difference between small and large traders' directional reaction to unaffiliated recommendation updates, but a large (73%) and marginally significant difference for affiliated recommendations. Strikingly, small traders exert more buy pressure on the occurrence of any recommendation, as the higher intercepts reveal. The difference between small and large traders is highly significant both for affiliated and unaffiliated recommendations. These results confirm the findings in Iskoz (2002), Malmendier and Shanthikumar (2007), and Mikhail, Walther, and Willis (2007) that large investors discount recommendations, in particular affiliated ones, while small investors do not.

The results are virtually identical when we split the sample into analysts with and without investment-banking pressure. Moreover, regardless of which determinant of analyst behavior we pick, we estimate a significantly positive slope coefficient for all investors but a significantly positive intercept only for small investors. The only exception is the subsample of stocks with no institutional ownership, where the small-investor intercept becomes insignificant, probably reflecting small sample size.

For annual forecast updates (Columns 4–6), by contrast, small traders fail to respond to the direction of the update: the slope coefficient is significantly negative for unaffiliated forecasts and insignificantly negative for affiliated forecasts. Only large traders

react positively to an increase in a forecast, both unaffiliated and affiliated, and their average reactions (intercepts) are again small and insignificant. In other words, large investors react strongly to the amount and direction of earnings forecasts, while small traders react positively regardless of whether an update is good news or bad news. As Column 6 shows, the differences in intercepts and slopes are highly significant. The results are the same when we split the data by the other proxies for analyst behavior: small investors always react significantly positively to any new forecast, but their response does not increase with the increase in forecast, relative to the previous one; and the reverse is true for large investors (again, other than the very small sample of stocks with no institutional ownership).

All results are similar if we restrict the analysis to analysts with at least one affiliated *and* one unaffiliated recommendation or forecast outstanding. The forecast results are consistent with the notion that small investors react to the information that a new forecast has been made but are not able to interpret the specific amount forecasted.

Related literature on earnings announcements suggests that small investors also fail to process the good or bad news contained in earnings numbers.[21] In Panel B, we test this notion directly. Following Battalio and Mendenhall (2005), we calculate both an analyst-based measure of earnings surprise and the Seasonal Random Walk (SRW) measure based on prior-year earnings. The analyst-based surprise is the announced value from IBES minus the most recent consensus, normalized by share price 20 trading days before the earnings announcement. The SRW surprise is fourth-quarter earnings minus earnings

[21] Kasznik and McNichols (2002) find that the market reaction to "meeting or beating" the consensus forecast is significantly stronger for firms with below-median analyst coverage, and thus lower institutional ownership (p. 755). Battalio and Mendenhall (2005) find that small traders respond more to SRW surprises while large traders respond to the more sophisticated analyst-based surprise, and Hirshleifer et al. (2008) find that individuals buy for both negative and positive extreme earnings surprises.

for the same quarter in the prior year, using earnings data from Compustat, normalized by the share price 20 trading days before the announcement.[22] We examine trading reactions on days [0,1] relative to the announcement.

Columns 1–3 of Panel B show that small investors display a large and statistically significant positive reaction to any news about the firm's earnings, as evidenced by a significantly positive intercept. Large traders also react significantly positively, but the reaction of small traders is 177% stronger, and the difference is highly significant (Column 3). The amount of earnings surprise, however, does not trigger a significant response among small investors, whether we include both measures or only one (unreported). The large investor reaction to the amount of earnings surprise is also insignificant but, in case of the analyst-based measure, significantly more positive than that of small investors.

The latter result becomes stronger when we include a dummy for the (analyst-based and/or SRW) surprise. As shown in Columns 4–6, large investors continue to react significantly more positively than small investors to the amount of analyst-based surprise. The surprise dummies reveal that the stronger small-trade reaction to any news reflects a more positive reaction to firms "meeting or beating" the SRW expected earnings.[23]

In summary, small investors discount less for the upward distortion of recommendations than do large investors, and only large investors incorporate whether a forecast update is good news or bad news. Relatedly, small investors react more positively than large investors to (meet or beat) earnings news, but do not process the amount of good news or bad news. The results imply that recommendation distortions have lower costs

[22] We require the Compustat earnings announcement date be within 2 days of the IBES date.
[23] The results are unaffected by various robustness checks, including variations in the calculation of the SRW surprise measure (excluding or including extraordinary items), adding squared terms of the surprise measures (to account for different reactions to extreme surprises), or controlling for the earnings value.

and larger benefits than forecast distortions. Hence, analysts who distort strategically might distort recommendations more than forecasts. Nonstrategic distorters, instead, should issue both the most optimistic recommendations and the most optimistic forecasts.

3.2 Management pressures and walk-down in earnings forecasts

Management pressures reinforce these differential incentives. While managers like to see optimistic recommendations, they tend to "guide" (or pressure) toward lower forecasts, at least at the end of the quarter or year, so that the firm can "meet or beat" expectations (Richardson, Teoh, and Wysocki 2004). As a last step of the auxiliary analysis, we test for walk-down patterns in our sample and test whether proxies for incentive misalignment are related to "walk-down."

In Table 4, we regress the error in the analyst's last forecast on the error in his first forecast (for the same annual earnings), to the usual misalignment proxies, and to the respective interaction terms, controlling for the timing of the last forecast. The stronger the walk-down pattern of an analyst, the more negative will be the correlation between the analyst's first and last forecast errors. As in Richardson, Teoh, and Wysocki (2004), we define forecast error as the forecast minus the actual value of earnings per share announced, normalized by share price prior to the first forecast. We use the full sample of all analysts in Columns 1 and 2, though restricted to recent issuers to avoid confounds with firm characteristics,[24] and the Regression Sample in Columns 3 and 4.

In the full sample, we estimate a significantly positive coefficient of "error in analyst's first forecast," suggesting no walk-down among unaffiliated analysts. And we es-

[24] Richardson, Teoh, and Wysocki (2004), instead, consider issuing and nonissuing firms and examine how the walk-down of the consensus forecast varies with respect to firm-level variables. If we include all firms, our results are stronger. In all models (Columns 1–6), but using all firms, we find negative significant coefficients on the interaction term Affiliation*(Forecast error for analyst's first forecast), with $p<0.001$.

timate a negative interaction effect of Affiliation and first-forecast error ($p << 0.01$). The economic magnitude of the interaction effect is large, amounting to a reduction of the baseline correlation (coefficient on first-forecast error) of over 60%. However, it is smaller than the level effect, implying no net walk-down pattern. The statistical and economic significance is virtually identical whether or not we include controls for the other determinants of analyst behavior (Bank Reputation Capital, Bank Loyalty Index, Institutional Ownership, and All-Star Status) as well as their interactions with first-forecast error. In addition, the interaction coefficient on Institutional Ownership is significantly positive, suggesting that firms with high institutional ownership exhibit less walk-down. If we substitute for Affiliation with the closely related proxy for Investment-Banking Pressure, we also estimate a significant *differential* walk-down pattern of similar magnitude.

The estimation results for the more restricted sample, shown in the next two columns, reveal, however, that even the differential walk-down pattern might reflect sample heterogeneity rather than an incentive effect. In the more homogeneous Regression Sample, we estimate the coefficient on Affiliation*(First forecast error) to be small and insignificant. The same is true for Investment-Banking Pressure.

Overall, neither affiliated analysts nor unaffiliated analysts exhibit a strong walk-down pattern. Even the difference between affiliated and unaffiliated analysts disappears in the more homogeneous Regression Sample. In untabulated results, we find that the Affiliation/Investment-Banking Pressure interaction coefficients remain significant in the restricted sample if we use indicators as in Table 1 (rather than continuous variables). Still, while our results do not rule out the existence of walk-down behavior among subsets of analysts, the lack of robustness raises concerns about the “strategic” interpretation of the walk-down pattern. Only the discrepancy between optimism in recommendations

and lack thereof in simultaneous forecasts will allow us to identify a strategic component.

4. Recommendations versus Forecasts: Individual-Level Analysis

In this section, we identify strategic motives on an individual level rather than in the aggregate. The aggregate comparisons could address concerns about differences in the composition of analysts or stocks or in the timing of recommendations and forecasts only partly, by restricting the data to a homogeneous set of analysts (affiliated in some stocks) and stocks (recent issuers). The individual-level analysis goes further: each recommendation/forecast pair holds constant the analyst, stock, and timing.

In Table 5, we regress Forecast Optimism on same-analyst, same-stock, same-day Recommendation Optimism, controlling for year, month, and day-of-the-week fixed effects, and compare the prevalence of strategic distortion between different types of analysts (e.g., affiliated and unaffiliated ones) by including the respective proxies (e.g., affiliation) and their interactions with Recommendation Optimism. Hence, our analysis tests for the existence of strategic distortion on average and among different types of analysts. To ensure a common time frame until the annual announcement, we consider all forecasts issued 80 to 1 days prior to the annual earnings announcements (and after the previous quarterly announcement).[25]

In Column 1, we test for discrepancies in recommendation and forecast optimism related to affiliation. We estimate an insignificantly positive coefficient on recommendation optimism, indicating that forecast optimism co-moves with recommendation opti-

[25] The timing of the prior quarterly earnings announcement varies. The vast majority occur 90–100 days before the annual announcement, and another significant fraction 83 to 90 days before. The mode is 98 days (5,635 announcements); the second-highest frequency is 91 days (4,491). There are between 168 and 876 observations for each of the days from 83 to 90, but the number of observations drops sharply, below 100, for 82 days and fewer. As a robustness check, we redid the analysis for each time period from [–81,–1] to [–89,–1]. All results are very similar, with the strongest effects for [–82, –1].

mism insignificantly. For affiliated analysts, instead, we estimate a negative coefficient on Affiliation*(Recommendation Optimism). Its magnitude is larger than the coefficient on Recommendation Optimism, and it is significant ($p < .05$). Both findings are unaltered if we include, separately or jointly, other proxies for incentive (mis-)alignment, as shown in Columns 2 to 6. (Remember that we cannot include investment-banking pressure at the same time as affiliation since it is a continuous version of the affiliation measure; we show it separately in the last column.) In all specifications, we can reject that the coefficient on Affiliation*(Recommendation Optimism) is positive. A one-tailed test generates *p*-values ranging from 0.036 to 0.046, and from 0.021 to 0.025 when we cluster by both analyst and date. We also estimate weighted regressions to further control for differences in the mix of firms with recent equity issuance covered by affiliated versus unaffiliated analysts for each firm. The coefficient on Affiliation*(Recommendation Optimism) remains very similar, and is significant with *p*-values ranging from 0.023 to 0.027. Hence, if an affiliated analyst has a more positive recommendation relative to the consensus, the same analyst's forecast is more negative, relative to the consensus, than it would be if he were unaffiliated. [26]

The results show that affiliation has a significant effect on analyst behavior, and that this change in behavior reflects a strategic choice. The economic significance is large. A one-standard-deviation increase in recommendation optimism induces affiliated analysts to become 59% more pessimistic in their forecast (using the Column 6 estimate,

[26] We also considered estimating a fixed-effects version of the econometric model estimated in Table 5. While the sample restrictions ensure that the effect of affiliation reflects the difference in behavior among analysts when they are affiliated versus not affiliated, a fixed-effects analysis would identify a given analyst's behavior when affiliated versus not. Such estimation would amount to including analyst fixed effects, their interactions with recommendation optimism, and possibly their interactions with affiliation. Unfortunately, the data do not provide enough of a time-series element to implement this: the majority of analysts in our Table 5 sample, 1,792 of 2,651, enter with at most 2 observations. In fact, 1,147 enter with only 1 observation. We conduct a more feasible fixed-effects approach in Table 7.

and evaluated at the affiliated Regression Sample average of forecast optimism, –0.447).

We also recalculate the effect including outstanding recommendations (rather than only simultaneous ones). As we discussed with our results on the strategic timing of recommendations, but not forecasts, a strategic distorter who is trying to "hide in the crowd" will issue recommendations when the general consensus is high, and will delay downgrading them when the consensus declines, even if he issues a less optimistic forecast. Thus the negative relationship between affiliated forecast and recommendation optimism should hold for previously issued recommendations, possibly more strongly so. When the strategic distorter finally updates his recommendation, the correlation between the optimism of the new (on average lower) recommendation and the previous more pessimistic forecast should be less negative or even positive.

Both implications hold in our data. In untabulated regressions, we estimate larger and more significant negative coefficients when we relate forecasts to the most recent outstanding recommendations rather than only simultaneous ones (and evaluate recommendation optimism as of the forecast date). If, on the other hand, we use the next recommendation, we estimate a less negative or even positive relationship (interaction coefficient).[27] In other words, affiliated analysts incorporate the negative information with some delay into their recommendations, and the relation between the optimism in their forecast and in their *next* recommendation becomes (weakly) positive.

A possible concern about the strategic interpretation of our findings is that differences between analysts' short- and long-term views might explain the results. An analyst might be pessimistic about near-term earnings but still recommend the stock because he

[27] Since the next recommendation may occur after the firm's earnings announcement, and be affected by it, we include before- and after-announcement dummies and interactions. The relevant (before-announcement) interaction is significantly positive for affiliated analysts and insignificant for unaffiliated.

is more optimistic about the firm's long-term growth prospects. While such an explanation cannot easily account for persistent discrepancies, we address the concern by analyzing long-term growth forecasts. As shown in the Online Appendix, affiliated analysts tend to exhibit *lower* long-term growth optimism than unaffiliated analysts, both for the full sample and the Regression Sample (Table OA1). The differences are significant at the 1% level. Relatedly, Table OA2 shows no differential timing in the updating of long-term growth forecasts, and Table OA6 reveals that, while there is a positive relationship between long-term growth optimism and recommendation optimism, it is not significantly stronger for affiliated analysts. The coefficients on Affiliation*(Recommendation Optimism) are insignificant and an order of magnitude smaller than the coefficients on Recommendation Optimism. Hence, the data do not support this interpretation.

We also test whether we can detect strategic behavior in other subgroups of analysts. We add, separately and jointly, the Recommendation Optimism interaction terms of Bank Reputation Capital, Bank Loyalty Index, Institutional Ownership, and All-Star Status. In Column 7, we show the joint specification (all estimation results from the separate specifications are fully consistent). The coefficient estimates reveal that Bank Reputation Capital, Institutional Ownership, and All-Star Status do not have predictive power. Moreover, the Bank Loyalty Index appears not to be a useful measure of "less strategic distortion." It predicts a pessimistic forecast with an optimistic recommendation, and the effect is significant at the 5% level. The latter result sheds light on the two competing effects discussed in Ljungqvist, Marston, and Wilhelm (2006): investment-banking client loyalty may induce analysts to distort more to continue the relationship, or the analyst may have less pressure to distort since the client is already loyal. Empirically, the former appears to be significantly more important in our sample. Finally, we substitute for Affil-

iation with Investment-Banking Pressure (Column 8). As expected, we find evidence of strategic distortion, very similar in size and significance to the affiliation effect.

In summary, our two-tongues identification reveals that, to a significant extent, the distortion displayed by affiliated analysts is strategic. That is, when affiliated analysts issue overly positive recommendations they are not misguided by their own overly optimistic beliefs. They are aware of their upward bias, as their less optimistic forecasts reveal. The same holds for analysts under investment-banking pressure. The same also holds for the Bank Loyalty Index, which has sometimes been interpreted as a proxy for less incentive to distort strategically; instead, we find that a higher loyalty index is associated with more strategic distortion. Other known determinants of analyst behavior are shown to be neither positively nor negatively related to strategic distortion.

5. "Forensic Accounting": Measuring Analyst Distortion

The correlation in recommendation and forecast optimism reveals that, on average, affiliated analysts and analysts under investment-banking pressure "speak in two tongues." We now use the recommendation-forecast discrepancy to construct a measure of strategic distortion that is independent of other determinants. The measure provides insights into the distribution, heterogeneity, and persistence of strategic distortion.

We construct the "two-tongues metric" based on the difference between an analyst's recommendation optimism and (scaled) forecast optimism for a given firm, as illustrated in Figure 1. The top graph displays the distribution of recommendation optimism, defined as recommendation minus the consensus as of the day of the recommendation. As before, numerical values range from 1 for strong sell to 5 for strong buy. The vast majority of observations lie between –2 and +2. The middle graph displays earnings forecast

optimism, defined as earnings-per-share forecast minus consensus, normalized by prior-day share price and multiplied by 100 (in order to make the economic magnitudes compatible with recommendations). Again, the vast majority of observations lie between –2 and +2. Our distortion measure is the difference between recommendation optimism and scaled forecast optimism, and is shown at the bottom. We see that the majority of observations lie again in the interval from –2 to +2, but also that the distribution is skewed to the right.

The corresponding statistics in Table 6, Panel A, confirm the right-skewness of the distribution. In the Regression Sample, the mean distortion is 0.34, but the median is 0.02. Overall, 56% of recommendation-forecast comparisons result in strictly positive values, indicative of widespread strategic distortion. Splitting again by the leading proxy for incentive misalignment, affiliation, we see that the mean distortion is larger among affiliated than among unaffiliated analysts, 0.47 versus 0.26. The difference is marginally significant (p = 0.06). The fractions of analysts with positive strategic distortion are, however, more similar, suggesting that affiliation fails to capture all strategic elements.

We also consider the larger sample of forecast-recommendation pairs that include the most recent outstanding recommendations issued prior to the forecast for cases of no simultaneous forecast. In this case, strategic distortion includes the distortion that is "implicit" in the delay of recommendation updates (as shown in Table 2). In the lower half of Panel A, we show the summary statistics for the larger sample. The mean distortion increases slightly, to 0.38, and the median goes up to 0.07. The difference between affiliated and unaffiliated analysts is somewhat narrower (0.43 and 0.34) but, given the larger sample size, more significant (p = 0.01). Again, the fractions of analysts with positive strategic distortion are similar.

We now illustrate that the distortion measure has significant predictive power for individual analyst behavior over time. That is, we show that there are significant analyst fixed effects, beyond the degree of strategic distortion captured by existing proxies.

One way to evaluate the persistence of strategic distortion in a given analyst is to ask how the likelihood of future strategic distortion depends on whether the analyst distorted strategically in the past. We calculate these transition probabilities using zero as a cutoff point for strategic distortion. The upper half of Panel B displays the transition matrix for same-day recommendation and forecast pairs. We find that a strategic distorter will distort again strategically for the same stock with 62% probability, while an analyst who did not distort strategically will start doing so with only 49% probability. A simple logit regression of an indicator for "next strategic distortion" on an indicator for "previous strategic distortion" confirms that the difference is highly significant. The same holds when we include year, month, and day-of-the-week indicators, and also if we control for time until the annual earnings announcement. Thus, analysts are much more likely to distort strategically if they did so before.

If we add implicit strategic distortion, that is, the component implicit in the timing of recommendations, and include forecasts matched to outstanding recommendations, the persistence increases, to 75% for a strategic distorter, and the difference to not-strategically distorting analysts (34%) widens, as shown in the lower half of Panel B. The increase from a 13 percentage point difference in the upper half of Panel B (0.62 – 0.49) to a 41 percentage point difference in the lower half (0.75 – 0.34) reveals that about one-third of the overall persistence is visible in "explicit distortion" while the remainder is "implicit" in not updating the recommendation downward when the consensus recommendation became more negative.

The predictive power is much weaker for different stocks, where observed and unobserved incentives to distort may differ. In the Regression Sample, a strategic distorter of one stock will do the same for another stock with 55% probability, while an analyst who did not distort strategically will start distorting strategically with 51% probability; this is similar in the larger sample (59% versus 51%). Hence, the predictive power amounts to only about a third relative to the same-stock magnitude.

We can go further in disentangling personal fixed effects from observable determinants and illustrate that the persistence is largely orthogonal to affiliation or other proxies for incentive (mis-)alignment. As shown in the next four columns of Panel B, the persistence among affiliated and among unaffiliated analysts is quite similar: an affiliated analyst will distort advice about the same stock again with 63% probability and will start distorting with 50% probability. The corresponding likelihoods for unaffiliated analysts are 61% and 50%. (The pattern is again even more striking in the larger sample, shown in the lower half: whether the analyst is affiliated or not, the persistence is 75% for previous strategic distorters, and new strategic distortion occurs with only 34–35% probability.) We confirm that there are no significant differences between affiliated and unaffiliated analysts with a simple logit estimation, relating an indicator for "next strategic distortion" to "previous strategic distortion," affiliation, and the interaction of affiliation and "previous strategic distortion." The interaction effect is never significant (regardless of whether and which time fixed effects and controls are included). Table 6, Panel B, also shows that the probabilities are virtually unaffected if the stock changes status from affiliated to unaffiliated. (The reverse is not true, but the sample size of unaffiliated analysts becoming affiliated and issuing same-day recommendation-forecast pairs twice is minimal, with 38 observations.) The strategic distortion of different stocks is, instead, much less predicta-

ble based on past strategic distortion of another stock. The results are again virtually identical for investment-banking pressure subsamples.

Overall, our results imply persistence in strategic distortion over time, strongly so for the same stock. The results indicate significant fixed effects in analyst behavior. Hence, the two-tongues discrepancy across different types of information provision can be used to identify analysts who distort strategically, above and beyond the distortive incentive effects due to affiliation. While affiliation is a strong predictor of strategic distortion, our measure reveals that unaffiliated analysts who have distorted strategically in the past are indistinguishable from affiliated analysts who have distorted strategically in the past—their probabilities of future distortion are high and virtually identical.

As a last step, we use the "two-tongues metric" as the dependent variable in a set of regressions relating distortion to existing incentive proxies. We explore the robustness of results to different samples: the most restricted sample used in our main Table 5 analysis (Regression Sample, further restricted to forecasts within 80 days of the announcement), the Regression Sample, and the full sample of all analysts and firms (all same-day forecast-recommendation pairs). The regression allows us to assess the link between existing incentive proxies and strategic distortion, while exploring alternative and larger samples.

The results are in Table 7. We include Affiliation in Columns 1–3 and the alternative proxy, Investment-Banking Pressure, in Columns 4–6. The results for the most restricted sample, which we used in our main analysis in Table 5, are shown in Columns 1 and 4; the results for the Regression Sample are in Columns 2 and 5; and the results for the full sample are shown in Columns 3 and 6.

Consistent with the main results in Table 5, we find that affiliation and, alterna-

tively, investment-banking pressure significantly increase the incidence of distortion, whether we use the most restricted sample, the full sample, or anything in between (including untabulated variations). Moreover, we find that, in the restricted sample, no other proxy is significantly related to our two-tongues indicator of strategic distortion. That is, affiliation-based proxies for incentive misalignment are the most reliable predictors of strategic distortion. When we remove the restriction to the last quarter prior to the annual announcement (Columns 2 and 4) or use the largest sample (Columns 3 and 6), Bank Reputation Capital becomes significant. The negative coefficient estimate suggests that a larger share in the underwriting market might relieve the pressure to distort. However, the lack of a significant result and different sign in the last-quarter sample suggests that even high-reputation firms occasionally distort strategically shortly before the annual earnings announcement. Similarly, the Bank Loyalty Index reverses sign (becomes positive) when moving to a less restricted sample and becomes significant in the full sample, implying *more* strategic distortion, consistent with our estimation results in Table 5. Hence, if anything, client retention appears to benefit from strategic distortion rather than relieving the pressure to distort—though the discrepancy between the significant effects in Columns 3 and 6 for the full sample and the insignificant estimates in the more restricted samples raise caution about confounds that are present in the less homogeneous sample, including analyst-, firm-, or timing-related effects. In either case, the results confirm that the Bank Loyalty Index is not a useful predictor of *less* incentive to distort.

All-star status and institutional ownership do not predict strategic distortion in any estimation, and the magnitude of the coefficients is very small. The (non-)results confirm the insight from Table 5 that all-star status and institutional ownership are not reliable predictors of less strategic distortion. As discussed in Section 1, all-star analyst status

captures an analyst's reputation with institutional investors, and a high reputation might reduce the pressure to distort strategically. However, strategic distortion might help analysts to protect their reputation. As for institutional ownership, the findings of Ljungqvist et al. (2007) that institutional investor ownership reduces analyst recommendation optimism relative to the consensus, and increases forecast accuracy, suggest that we should expect less "speaking in two tongues." In untabulated regressions, we find that the (small and negative) coefficient estimate becomes significant when restricting the sample to recent issuers but not when further restricting the set of analysts or the time period in which the recommendation-forecast pairs are issued.

Finally, we exploit the simpler regression model of Table 7 (relative to Table 5) to explore the possibility of a fixed-effects estimation.[28] We reestimate the regressions both for the most restricted sample (Columns 1 and 4) and for the Regression Sample (Columns 2 and 5), including analyst fixed effects. We find that the key coefficient estimates (affiliation and investment-banking pressure) are very similar in magnitude. The coefficient on affiliation changes from 0.1285 to 0.1093 in Column 1 and from 0.1023 to 0.0818 in Column 2; the investment-banking coefficient changes from 0.1851 to 0.1669 in Column 4 and from 0.1284 to 0.1225 in Column 5. The new coefficients are highly significant in the Regression Sample, but insignificant in the most restricted sample. The lack of significance in the most restricted sample is not surprising since the cumulative restrictions leave even less of a time-series element in the data. The other coefficient estimates are insignificant or marginally significant (Bank Reputation Capital). Finally, in

[28] In Table 5, we could not include analyst fixed effects, as the vast majority of analysts enter with at most 2 observations and because the analysis would have required the inclusion not only of analyst fixed effects but also of their interactions with recommendation optimism, and possibly their interactions with affiliation. The Table 7 setup does not require the inclusion of interaction terms; it does, however, still suffer from the lack of analyst-level time series.

the full sample (corresponding to Columns 3 and 6), the number of fixed effects is still too high, with over 13,000 fixed effects.

Overall, the table and the additional robustness checks not only confirm our main result—significant strategic distortion among analysts who are affiliated or subject to investment-banking pressure—but also help to shed light on the role of strategic distortion in other subgroups of analysts as well as on confounds that may falsely lead to a strategic interpretation. Most important, our distortion measure identifies whether an analyst is more or less strategically distorting, on a recommendation-specific level.

6. Conclusion

This paper provides a novel empirical approach to disentangle strategic and nonstrategic motivations to distort recommendations upward. We show that, compared with unaffiliated analysts, affiliated analysts issue more positive recommendations but similar or more negative forecasts. In addition, recommendations and forecasts for the same stock are more negatively correlated for a given analyst if he is affiliated than if he is unaffiliated. Additional results on the timing and updating of recommendations and forecasts suggest that affiliated analysts "hide in the crowd" when issuing new recommendations and then maintain positive recommendations (but not forecasts) longer than unaffiliated analysts. The same holds for analysts subject to investment-banking pressure.

Our findings suggest that affiliated analysts (and analysts subject to investment-banking pressure) strategically choose to display optimism about the firms they cover in one outlet for investment advice, namely recommendations, which are consumed most directly by small investors. They abstain from doing so in another outlet, earnings forecasts, which are consumed most directly by large investors. Instead, they appear to distort

the last forecast before the earnings announcement downward, consistent with management pressures to provide "beatable" forecasts. The stronger inclination of affiliated analysts to distort strategically holds even when comparing the same analyst's behavior for stocks with which he is affiliated and for stocks with which he is unaffiliated and using recommendations and forecasts issued concurrently. Other determinants of analyst behavior, such as Bank Reputation Capital, the Bank Loyalty Index, Institutional Ownership, and All-Star Status, are not clearly indicative of less strategic distortion. That is, while they are significantly related to analyst behavior, as shown in previous literature, these effects are not cleanly identifiable as less strategic; instead, these effects might reflect non-strategic differences between analysts or underlying sample heterogeneity in the types of analysts or stocks.

We also identify significant analyst effects, above and beyond the effect of affiliation (investment-banking pressure). We develop a metric capturing the discrepancy in recommendations and forecasts, and show that an analyst who displayed strategic distortion once is highly likely to do so again while an analyst who did not distort strategically when covering a stock is significantly less likely to do so at the next instance.

Our findings have implications for policy debates about brokerage-house regulation. Given the strong results for affiliated analysts, our results corroborate the importance of eliminating misaligned incentives due to affiliation. The persistence results, however, imply that some analysts are generally more inclined to distort strategically, above and beyond identifiable incentives. While our results do not imply a solution to the distortion problem, our measures of strategic distortion can provide a useful tool to identify a candidate group of strategic distorters. The same applies to a broader realm, beyond analyst behavior. The phenomenon of "speaking in two tongues" is likely to be found in

other settings of accounting and financial intermediation, wherever a strategic player is faced with distinct audiences for different informational outlets. One example involves earnings disclosure and financial accounting reports (Hirshleifer and Teoh 2003). Another example is the way firms represent their earnings and growth prospects in front of investors versus in negotiations with unions. The comparison of the information provided in both types of informational outlets can be helpful in measuring strategic components.

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Data Appendix

Determinants of analyst behavior. In our analysis, we relate the "two-tongues metric" of strategic distortion to the main determinants of analyst behavior identified in previous literature: affiliation, investment-banking pressure, bank reputation capital, bank loyalty index, institutional ownership, and all-star status. We construct these variables as follows:

Affiliation. Following prior work (e.g., Lin and McNichols 1998 and Michaely and Womack 1999), we define analysts to be affiliated if their investment bank was the lead or co-underwriter of an initial public offering (IPO) of the firm the analyst is reporting on during the past five years, or of a seasoned equity offering (SEO) of the firm during the past two years. We use the SDC New Issues database to obtain all underwriting data since 1987. 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 (2008) to identify additional matches.[29]

Investment-Banking Pressure. Our definition of investment-banking pressure follows Ljungqvist et al. (2007). We calculate the investment-banking pressure of analysts in bank *j* covering firm *k* in year *t* as follows: We use SDC New Issues data and determine whether *k* extended an underwriting mandate to bank *j* (or any of *j*'s predecessors in the case of mergers). We then accumulate the proceeds (file amounts) from the deals that *j* and its predecessors managed for company *k* in the preceding five years and divide by the total file amount of *k*'s deals during the same period.

Bank Reputation Capital. To calculate reputational capital, measured as a bank's share in the underwriting market, we follow Ljungqvist, Marston, and Wilhelm (2006) and Ljungqvist et al. (2007) in applying the Megginson and Weiss (1991) measure of underwriter quality (the bank's share of the IPO market) to a broader set of securities. We use the SDC New Issues data to calculate a bank's market share as the amount of equity it raised as the lead underwriter for its clients in the prior calendar year divided by the total amount of equity raised by all issuers in that year. In the case of more than one lead underwriter, we assign one *n*th of the amount raised to each of the *n* underwriters. Following Ljungqvist et al. (2006), we ignore overallotment options; exclude equity transactions by firms with Standard Industrial Classification codes 6000–6999 and 9000–9999; and, after a merger between two banks, assign prior deals of both banks to the merged entity.

Bank Loyalty Index. We follow Ljungqvist, Marston, and Wilhelm (2006) and Ljungqvist et al. (2007) in constructing the bank loyalty index for bank *j* in year *t* as the ratio of the number of firms that used bank *j* both in their penultimate and in their most recent deals to the number of firms that used bank *j* in their penultimate deal. The calculation is based on all deals in the last five years. By construction, the loyalty index ranges from 0 to 1.

Institutional Ownership. We use the quarterly 13(f) SEC filings to calculate total institutional ownership for all stocks in our sample. Section 13(f) of the 1934 Securities Exchange Act requires all institutions who invest over $100 million in exchange-traded

[29] 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.

or Nasdaq-quoted stocks, equity options, and warrants (as well as in closed-end funds, certain convertible debt, and exchange-traded funds) to report their aggregate equity ownership of a stock. Only small positions (fewer than 10,000 shares of a given issuer with an aggregate market value of less than $200,000) are exempt.

All-Star Status. An analyst has all-star status if institutional investors have ranked the analyst in the annual "All-Star Analyst" list in the October issues of the *Institutional Investor Magazine* in the top, second, or third team. We exclude runners-up.

Investor trade reaction. As described in the paper, we analyze the reaction of small (individual) and large (institutional) investors to recommendation and forecast updates.

Investor Type. We separate small and large investors by trading size. We follow Lee and Radhakrishna (2000) in choosing dollar- rather than share-based cutoffs (since they minimize noise in separating individuals from institutions) and in allowing for a buffer zone between small and large trades. We choose $20,000–$50,000 as the buffer zone. These 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: ≤$5,000; $5,000–$10,000; $10,000–$20,000.)

Malmendier and Shanthikumar (2007) show that these proxies are effective measures of individual and institutional trades until about 2000. As they discuss, the small portfolio size of most individual investors ensured that their trades remained below $50,000. The distribution of trade sizes on the NYSE was quite stable from 1993 through 2000, but institutions began splitting their trades more aggressively in the early 2000s, and the distinction between "small" and "large" trades disappeared. We thus limit the analysis of trade reactions to 1993–2002, as in Malmendier and Shanthikumar (2007).

Trade Reaction. Our measure of "directional trade reaction" (trade initiation) is a modified version of the Lee and Ready (1991) algorithm, as developed in Odders-White (2000). To determine who initiated a trade—the investor buying or the investor selling—the algorithm matches the trade to the most recent quote that precedes the trade by at least five seconds. If a price is nearer the bid (ask) price than the most recent preceding quote, 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), that is, if the price is higher than the price of the previous trade. We drop trades at the bid-ask midpoint, which are also the same price as in preceding trades.[30] The raw and the normalized trade imbalance measures are described in the main text and follow Shanthikumar (2004). (But see also the measures in Lee 1992 and Hvidkjaer 2006.)

[30] 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.

Online Appendix
Results using Quarterly Earnings and Long-Term Growth Forecasts

We replicate Tables 1-4 of the paper relating quarterly earnings forecasts (QEFs) and long-term growth forecasts (LTGFs) to recommendations or, alternatively, to annual earnings forecasts (AEFs). This analysis has much less of a clear conceptual motivation than the main analysis of the main paper. The analysis in the main paper, which relates forecast optimism to recommendation optimism, is motivated by the different audiences of the two types of investment advice and, as a result, the different incentives to distort. LTGFs are, instead, more difficult to categorize in terms of target audience and incentives. 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 and making them more similar to recommendations. QEFs are comparable to AEFs in terms of audience, but their comparison with recommendations has another shortcoming: While the time frame of AEFs is comparable to that of recommendations (up to one-year perspective), the same does not hold for QEFs (nor for LTGFs). QEFs follow a shorter, quarterly schedule, which constrains analysts more, e.g. in their (strategic) timing of updates. LTGFs, instead, follow a longer and ambiguous schedule. Most often, long-term growth is defined as the expected annual rate of earnings growth over the next three to five years (Thomson Financial [2004]); but Sharpe [2005] estimates that the market prices long-term growth forecasts as if applicable to a five to ten year horizon. As a result, the comparison of recommendation optimism or of AEF optimism to QEF or LTGF optimism cannot easily be used to measure strategic distortion. The comparison with LTGFs is, however, helpful in addressing concerns about recommendations aiming at a longer-term perspective than AEFs, as discussed in the paper. Hence, we replicate the analyses with LTGFs to understand the role of different horizons and for completeness. The latter is also the motivation for analyzing QEFs.

The QEF and LTGF data come from IBES. Our proxies for distortion mirror those employed in the main paper for annual earnings forecasts and recommendations: forecast minus consensus. For quarterly earnings forecasts, the consensus calculation is the average of the most recent forecasts of each analyst during the quarter, following the prior quarterly earnings announcement and the earnings-per-share optimism is normalized by share price. LTGF and LTGF optimism are expressed in percent.

As reported in Panel A of Appendix-Table OA.1, the sample includes 1,120,420 quarterly earnings forecasts (QEF) and 217,645 long-term growth forecasts (LTGF) with sufficient data to calculate a consensus. If we restrict the analysis to firms that could possibly have affiliated analysts (recent issuers) and to analysts who are currently affiliated for at least one stock and unaffiliated for at least one stock, with simultaneous forecast/LTGF and recommendation issuance, akin to the Regression Sample in the paper, the sample size is reduced to 18,970 QEFs and 8,166 LTGFs. In other words, another limitation of the LTGF analysis is its rather small size, amounting to about 24% of the size of the Regression Sample in the main paper.

Table OA.1 shows consensus-adjusted levels of QEFs and LTGFs. The

unadjusted level of QEFs corresponds to roughly one quarter of the annual forecasts. Adjusted QEFs do not differ significantly between affiliated and unaffiliated analysts, and LTGFs are significantly more *pessimistic* among affiliated than among unaffiliated analysts, both for the full and for the Regression Sample (or anything in between, such as the sample restricted to recent issuers). Among other determinants of analyst behavior, only bank reputational capital predicts a significant effect, namely, more optimistic QEFs. All other differences are statistically insignificant. The summary statistics give a first indication that the concerns about using QEF or LTGF optimism in a similar manner as we are using the comparison of recommendation and AEF optimism to detect strategic distortion are justified – the different horizons and mixed audiences and incentives prevent give rise to a rather different aggregate pattern.

The differences in the timing of QEF and LTGF updates confirm this impression. Table OA.2 shows the timing pattern for the subsamples of affiliated and unaffiliated anlaysts. Similarly to AEFs, there is virtually no difference in the updating of QEFs or LTGFs between unaffiliated and affiliated analysts. None of the slight (at most one- to two-day for QEF and four- to twenty-day for LTGF) differences shown in the upper half of Panel A are significant, as Panel B reveals.

Turning to investors' trade reaction to QEFs and LTGFs, Panel B of Table OA.1 shows the summary statistics. Small and large traders increase their buying and selling on both QEF and LTGF dates. However, as Appendix-Table OA.1 shows, small investors react positively to "any" updates (significantly positive intercept) but their reaction does not reflect the direction and magnitude of the update: the slope coefficient ("Update") is either insignificant or negative. Large investors, instead, react positively in the direction of the update, at least if the analyst is unaffiliated. The differences in intercept and slope between small and large traders are significant for both unaffiliated and affiliated analysts in the case of QEFs, but not in the case of LTGFs. For LTGFs, only the difference in the average reaction (intercept) is significant, marginally so in the case of affiliated analysts.

Relatedly, Panel B, shows that small traders react to whether a firm "meets or beats" quarterly earnings expectations but not to the magnitude of the earnings surprise, for quarterly earnings surprises, while large traders also react to the magnitude of analyst-based earnings surprises (see Columns 4 and 5).

The trade reactions confirm that QEFs and LTGFs are not a useful measure of strategic distortion Given that small traders do not react positively to the direction and amount of QEF and LTGF updates and large traders do not react positively to the updates of affiliated analysts, affiliated analysts do not have the option to target large investors. As such, we cannot make predictions regarding unaffiliated versus affiliated QEF and LTGF behavior, relative to recommendations and annual earnings forecasts.

We also test whether analysts display a "walk-down" pattern in their quarterly earnings forecasts. Despite the incentives to bias earnings forecasts downwards when close to the earnings announcement, particularly given that investors react positively when firms "meet or beat" earnings expectations, we did not find robust evidence of a strong walk-down pattern in annual earnings forecasts.

We test whether affiliated analysts display a stronger walk-down of their quarterly earnings forecasts than unaffiliated analysts by relating analysts' first and last forecasts.

The results are presented in Table OA.4. We find positive significant coefficients on the error in the analyst's first forecast, indicating that unaffiliated analysts who are the most optimistic at the start of the quarter tend to be the most optimistic at the end of the quarter. However, the coefficient on the interaction between the affiliation indicator and the forecast error for the analyst's first forecast is small, positive, and insignificant. That is, neither affiliated nor unaffiliated analysts display walk-down behavior in QEFs. The same holds for analysts subject to (or not subject to) investment-banking pressure. In fact, none of the proxies reveals a walk-down pattern for any subset of analysts.

Appendix-Table OA.5 relates quarterly earnings-forecast optimism to recommendation optimism. The table shows results for all earnings forecasts made by analysts who are currently affiliated and unaffiliated for stocks with recent equity issuances, for the set of quarterly earnings forecasts with a simultaneous recommendation. There is no relation between quarterly earnings forecast optimism and recommendation optimism in any of the specifications, nor is there a differential relation for affiliated analysts. Appendix-Table OA.6 relates long-term growth forecast optimism to recommendation optimism. There is a positive relation between long-term growth optimism and recommendation optimism when the long-term growth forecast and recommendation are made simultaneously, and this relation does not differ for affiliated analysts, or for any of the other incentive measures. In fact, affiliated analysts issue more *negative* long-term growth forecasts in general, controlling for their recommendation optimism, as evidenced by the significantly negative coefficients on affiliation. Hence, while the analysis does not help to re-estimate two-tongues behavior, given the lack of differential small/large investor reaction, it does help addressing concerns about timing differences explaining our results. More positive recommendations and more negative forecasts are not explained by (nonstrategic) differences in more positive long-term and more negative short-term views. Rather, the evidence on LGTFs confirms that the long-term views of affiliated analysts are more negative.

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Figure 1. Two-tongues metric

The graphs illustrate the construction of our measure of strategic distortion, Recommendation Optimism minus scaled Forecast Optimism. The top figure displays the distribution of Recommendation Optimism, defined as recommendation minus consensus recommendation as of that day. The middle figure displays Forecast Optimism, defined as earnings-per-share forecast minus consensus, normalized by prior-day share price and multiplied by 100. The bottom figure displays the difference between Recommendation Optimism and scaled Forecast Optimism.

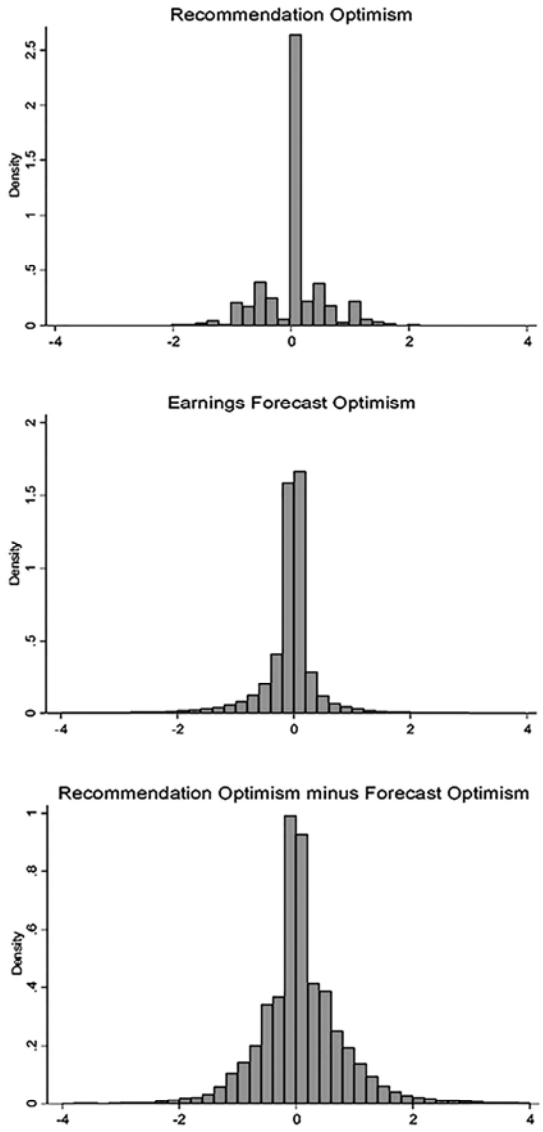

Table 1 Summary statistics

Panel A. Recommendations and earnings forecasts

	Recommendation Optimism						Forecast Optimism					
	Sample size	Mean	St. dev.	Percentile 25th	50th	75th	Sample size	Mean	St. dev.	Percentile 25th	50th	75th
Full Sample												
All	459,283	-0.002	0.548	0.000	0.000	0.000	1,623,715	-0.168	11.201	-0.175	-0.005	0.092
Unaffiliated	417,117	-0.004	0.556	-0.100	0.000	0.000	1,491,831	-0.165	8.286	-0.172	-0.006	0.091
Affiliated	42,166	0.010	0.463	0.000	0.000	0.000	131,884	-0.196	27.713	-0.212	-0.002	0.110
Regression Sample												
All	34,214	-0.003	0.488	0.000	0.000	0.000	34,214	-0.343	10.124	-0.198	-0.011	0.065
Unaffiliated	21,989	-0.013	0.500	0.000	0.000	0.000	21,989	-0.280	7.065	-0.180	-0.010	0.059
Affiliated	12,225	0.014	0.466	0.000	0.000	0.000	12,225	-0.457	14.038	-0.236	-0.013	0.076
Inv.-Banking Pressure = 0	21,926	-0.014	0.499	0.000	0.000	0.000	21,926	-0.249	6.604	-0.181	-0.010	0.059
Inv.-Banking Pressure > 0	12,288	0.015	0.469	0.000	0.000	0.000	12,288	-0.511	14.406	-0.231	-0.013	0.075
Bank Rep. Capital = 0	10,594	-0.007	0.501	0.000	0.000	0.000	10,594	-0.383	11.303	-0.191	-0.009	0.069
Bank Rep. Capital > 0	23,620	-0.002	0.483	0.000	0.000	0.000	23,620	-0.326	9.548	-0.203	-0.012	0.063
Bank Loyalty Index = 0	10,117	0.001	0.474	0.000	0.000	0.000	10,117	-0.258	6.649	-0.193	-0.011	0.057
Bank Loyalty Index > 0	24,097	-0.005	0.494	0.000	0.000	0.000	24,097	-0.379	11.268	-0.201	-0.011	0.068
Instit. Ownership = 0	587	0.028	0.604	-0.375	0.000	0.400	587	-0.116	2.967	-0.161	0.000	0.163
Instit. Ownership > 0	33,627	-0.004	0.486	0.000	0.000	0.000	33,627	-0.347	10.205	-0.199	-0.011	0.064
All-Star Analyst = 0	31,305	0.000	0.490	0.000	0.000	0.000	31,305	-0.353	10.512	-0.196	-0.011	0.066
All-Star Analyst = 1	2,909	-0.035	0.471	-0.200	0.000	0.000	2,909	-0.245	4.044	-0.228	-0.014	0.057

Recommendation Optimism is measured as recommendation minus existing consensus, where recommendations are translated into numerical values following the scheme 1=strong sell, 2=sell, 3=hold, 4=buy, 5=strong buy. Forecast Optimism is measured as the annual earnings forecast minus the existing consensus, where annual earnings forecasts are reported in earnings-per-share dollars, normalized by prior-day stock price. The Full Sample includes all recommendations and forecasts as long as the underlying share price is at least $5 and at least three analysts covering the firm. An analyst is Unaffiliated if his or her brokerage firm does not belong to a bank that has been lead or co-underwriter in the stock's IPO over the past five years or SEO over the past two years; otherwise the analyst is Affiliated. The Regression Sample reduces heterogeneity between Unaffiliated and Affiliated analysts and the stocks they cover by requiring (i) that the analyst is simultaneously affiliated (for some stocks) and unaffiliated (for some other stocks); (ii) that affiliation is possible for the stock receiving the recommendation or forecast (i.e., the firm had at least one IPO in the past five years or SEO in the past two years); (iii) that the recommendation and the forecast are issued on the same day. Investment-Banking Pressure for an analyst's bank j covering firm k in year t is the sum of file amounts from all deals that bank j (and its predecessors in the case of mergers) managed for company k in the preceding five years, divided by the total file amount of k's deals during the same period. Bank Reputation Capital is the underwriting market share of the analyst's bank, defined as the amount of equity the bank raised as the lead underwriter for its clients in the prior calendar year divided by the total amount of equity raised by all issuers in that year. The Bank Loyalty Index applicable to an analyst of bank j in year t is the ratio of the number of companies that used bank j in both their last and their penultimate deals to the number of companies that used bank j in their penultimate deals, based on all deals in the last five years. Institutional Ownership is calculated from quarterly 13(f) SEC filings. All-Star Analysts are the top, "second team," and "third team" analysts in the most recent October issue of *Institutional Investor* magazine. 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. The sample period is 2/01/1994 to 12/31/2008.

Table 1 Continued

Panel B. Measures of trade reaction

	All dates			Recommendation dates			Forecast dates		
	Mean	Med.	St.dev.	Mean	Med.	St.dev.	Mean	Med.	St.dev.
Number of small buy-initiated trades	48.27	15	92.12	117.01	47	160.34	102.83	42	144.85
Number of large buy-initiated trades	23.52	3	67.74	71.90	21	130.32	69.71	21	128.18
Number of small sell-initiated trades	42.07	15	79.23	99.96	43	138.86	86.23	38	123.51
Number of large sell-initiated trades	19.44	3	55.77	59.16	18	108.37	56.89	18	105.09
Total number of small buy/sell-initiated trades	90.34	30	168.61	216.97	91	294.30	189.07	81	263.82
Total number of large buy/sell-initiated trades	42.97	6	122.63	131.06	39	236.88	126.60	39	231.55
Δ(buy-sell) initiated small trades	6.20	1	33.13	17.05	4	58.04	16.60	4	53.61
Δ(buy-sell) initiated large trades	4.08	0	18.98	12.74	2	36.70	12.83	2	36.52
N	3,730,866			174,570			514,535		

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. The sample is limited to stocks for which past affiliation is possible (i.e., stocks with an IPO in the past five years or SEO in the past two years). The sample period is 2/01/1994 to 12/31/2002.

Table 2 Timing of recommendations and forecasts

Panel A. Sample statistics

	Mean (median) number of days until new recommendation or forecast					
		Conditional on level of recommendation				
Recommendations	Overall	Strong sell	Sell	Hold	Buy	Strong buy
Unaffiliated	314.8	228.7	254.4	319.8	306.4	333.6
	(195)	(120)	(144)	(196)	(189)	(212)
Affiliated	341.0	205.1	240.0	331.4	339.4	373.2
	(213)	(117)	(139)	(203)	(213)	(244)

		Relative to consensus		
Earnings forecasts	Overall	Below	Equal to	Above
Unaffiliated	63.4	61.7	81.3	64.8
	(54)	(52)	(71)	(56)
Affiliated	63.3	61.7	77.8	64.5
	(55)	(53)	(69)	(57)

Panel B. Regression analysis

	Days until update	Diff. to consensus		Days until update
	(1)	(2)		(3)
Strong sell, Sell	245.52***	-0.6790***	Above consensus	64.77***
	(7.24)	(0.01)		(0.38)
Hold	319.81***	-.2333***	Equal to consensus	81.32***
	(3.64)	(0.00)		(1.92)
Buy, Strong buy	318.44***	0.1860***	Below consensus	61.66***
	(2.78)	(0.00)		(0.39)
(Strong sell, Sell) *(Affiliation)	-13.78	0.1482***	(Above consensus) *(Affiliation)	-0.26
	(9.75)	(0.02)		(0.38)
(Hold) *(Affiliation)	11.54**	0.0474***	(Equal to consensus) *(Affiliation)	-3.53
	(4.52)	(0.00)		(2.55)
(Buy, Strong buy) *(Affiliation)	36.11***	-0.0268***	(Below consensus) *(Affiliation)	0.00
	(3.50)	(0.00)		(0.37)
Number of observations	94,821	99,020	Number of observations	241,890
R^2	0.44	0.25	R^2	0.53

Panel A presents summary statistics for the number of days until the next recommendation or forecast by the same analysts for the same stock. Panel B presents results from ordinary least squares (OLS) regressions of the number of days until the next recommendation or forecasts by the same analyst for the same stock (Columns 1 and 3) and of recommendation level minus consensus (average over the past month, Column 2) on recommendation or forecast controls and their interactions with affiliation dummies. Standard errors (in parentheses) are robust to arbitrary heteroskedasticity and within-date correlation. ***, **, and * mark significance at the 1%, 5%, and 10% levels respectively. For both panels, the sample is limited to analysts with possible affiliation (i.e., to analysts who have at least one affiliated and at least one unaffiliated recommendation or forecast outstanding) and to firms with possible affiliation (i.e., to firms with an IPO in the past five years or an SEO in the past two years, and with at least three analysts covering the stock), and excludes reiterations. The sample period is 2/01/1994 to 12/31/2008.

Table 3 Trade reaction to recommendations, forecasts, and earnings surprises

Panel A. Reaction to analyst updates

		Recommendations			Annual earnings forecasts		
		Small traders	Large traders	Difference (S-L)	Small traders	Large traders	Difference (S-L)
		(1)	(2)	(3)	(4)	(5)	(6)
Unaffiliated	Update	0.0917***	0.0875***	0.0042	-0.2808**	0.4527***	-0.7335***
		(0.0126)	(0.0106)	(0.0165)	(0.1372)	(0.1279)	(0.1876)
	Constant	0.1590***	-0.0166	0.1756***	0.1509***	-0.0007	0.1516***
		(0.0188)	(0.0152)	(0.0242)	(0.0124)	(0.0110)	(0.0166)
Number of observations			10,970		51,832	51,832	
R^2		0.0055	0.0068		0.0001	0.0003	
Affiliated	Update	0.1224***	0.0722***	0.0502*	-0.1430	0.4252***	-0.5682***
		(0.0209)	(0.0183)	(0.0278)	(0.1307)	(0.1513)	(0.1999)
	Constant	0.1805***	-0.0292	0.2097***	0.1764***	0.0066	0.1698***
		(0.0279)	(0.0233)	(0.0363)	(0.0157)	(0.0130)	(0.0204)
Number of observations		4,033	4,033		20,295	20,295	
R^2		0.0088	0.0042		0.0000	0.0003	

Panel B. Reaction to earnings surprises

	Small traders	Large traders	Difference (S-L)	Small traders	Large traders	Difference (S-L)
	(1)	(2)	(3)	(4)	(5)	(6)
Analyst-based surprise	-1.2078	0.8556	-2.0634***	-1.4103*	0.8700	-2.2803***
	(0.7980)	(0.6126)	(1.0060)	(0.7522)	(0.6238)	(0.9772)
Analyst-based "meet or beat" Dummy				0.0090	-0.0039	0.0129
				(0.0336)	(0.0328)	(0.0470)
Seasonal Random Walk (SRW)-based surprise	0.0796	0.0076	0.0720	-0.3343	0.0017	-0.3360
	(0.2467)	(0.2215)	(0.3315)	(0.2405)	(0.2309)	(0.3334)
SRW-based "meet or beat" Dummy				0.1837***	0.0037	0.1800***
				(0.0410)	(0.0362)	(0.0547)
Constant	0.1425***	0.0515***	0.091***	0.0204	0.0515	-0.0311
	(0.0232)	(0.0196)	(0.0304)	(0.0395)	(0.0328)	(0.0513)
Number of observations	7,484	7,483		7,484	7,483	
R^2	0.0003	0.0002		0.0036	0.0002	

Panel A shows results from OLS regressions of trade reactions on recommendation and forecast update values. Panel B shows results from OLS regressions of trade reaction on earnings surprise values. Trade reaction is measured by abnormal trade imbalance, measured as the sum of days 0 and 1 of the update or earnings announcement. Large traders represent trades of at least $50,000; small traders represent trades of less than $20,000. For consistency with the other analyses, the sample is further limited to stocks for which past affiliation is possible (i.e., stocks with an IPO in the past five years or SEO in the past two years). In Panel A, 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 prior-day share price (and multiplied by 100). The sample is further limited to stocks for which both small and large trade is defined (i.e., stock price of at most $200), and with at least three analysts covering the firm. For Panel B, Analyst-Based Surprise is calculated as the announced value of earnings (from IBES) minus the most recent consensus forecast, normalized by share price twenty trading days before the earnings announcement. Seasonal Random Walk (SRW)-Based Surprise is calculated as the fourth-quarter earnings minus the earnings for the same quarter in the prior year, using earnings data from Compustat, normalized by the share price twenty trading days before the earnings announcement. We require that the earnings announcement date from Compustat be within two days of the IBES earnings announcement date. In both panels, standard errors (in parentheses) are robust to arbitrary heteroskedasticity and within-day correlation. ***, **, and * mark significance at the 1%, 5%, and 10% levels respectively. The sample period is 2/01/94 to 12/31/02.

Table 4 Analyst forecast walk-down

	All	All	Aff. + Unaff.	Aff. + Unaff.
Affiliated	0.0079**		0.0070*	
	(0.0035)		(0.0036)	
Error in analyst's first forecast	0.3845***	0.4090***	0.1044	0.1637
	(0.0666)	(0.0663)	(0.2556)	(0.2764)
Affiliated*(Error in analyst's first forecast)	-0.3218***		-0.1313	
	(0.1235)		(0.1880)	
Bank Reputation Capital	-1.4270	-1.3169	-0.1975	-0.2540
	(0.9319)	(0.9373)	(0.9169)	(0.9714)
Bank Loyalty Index	-0.0023	-0.0029	-0.0061	-0.0067
	(0.0044)	(0.0045)	(0.0074)	(0.0075)
Institutional Ownership	0.0000	0.0000	-0.0001	0.0000
	(0.0000)	(0.0000)	(0.0001)	(0.0001)
All-Star Status	-0.0007	-0.0008	-0.0018	-0.0018
	(0.0010)	(0.0010)	(0.0014)	(0.0013)
(Bank Reputation Capital)*(Error first forecast)	74.9520	56.8367	-17.6631	-19.6856
	(47.9041)	(45.2110)	(44.3529)	(44.1896)
(Bank Loyalty Index)*(Error first forecast)	0.0338	0.0876	0.2210	0.2487
	(0.2027)	(0.2032)	(0.3652)	(0.3647)
(Institutional Ownership)*(Error first forecast)	0.0047***	0.0032***	0.0078***	0.0062**
	(0.0012)	(0.0011)	(0.0022)	(0.0030)
(All-Star Status)*(Error first forecast)	0.0186	-0.0093	0.1784	0.1396
	(0.0715)	(0.0470)	(0.1142)	(0.1079)
Investment-Banking Pressure		0.0091**		0.0085*
		(0.0043)		(0.0045)
(Inv.-Banking Pr.)*(Error first forecast)		-0.3902***		-0.2096
		(0.1437)		(0.2321)
Time to annual earnings announcement	0.0308***	0.0314***	0.0284***	0.0288***
	(0.0051)	(0.0050)	(0.0078)	(0.0074)
Constant	-0.0050	-0.0050	-0.0030	-0.0032
	(0.0042)	(0.0041)	(0.0071)	(0.0069)
Number of observations	145,052	145,052	90,964	90,964
R^2	0.2345	0.2416	0.1139	0.1171

The table presents results from OLS regression of analysts' errors in their last forecast, defined as the earnings forecast minus the earnings realization, normalized by the share price before the analyst's first forecast for the firm-year. Affiliated is a dummy equal to 1 if the analyst is affiliated in the stock at that point in time. Bank Reputation Capital is the underwriting market share of the analyst's bank, defined as the amount of equity the bank raised as the lead underwriter for its clients in the prior calendar year divided by the total amount of equity raised by all issuers in that year. The Bank Loyalty Index applicable to an analyst of bank *j* in year *t* is the ratio of the number of firms that used bank *j* both in their last and their penultimate deals to the number of firms that used bank *j* in their penultimate deals, based on all deals in the last five years. Institutional Ownership is calculated from quarterly 13(f) SEC filings. All-Star Analysts are the top, "second team," and "third team" analysts in the most recent October issue of *Institutional Investor* magazine. Investment-Banking Pressure for an analyst's bank *j* covering firm *k* in year *t* is the sum of file amounts from all deals that bank *j* (and its predecessors in the case of mergers) managed for company *k* in the preceding five years, divided by the total file amount of *k*'s deals during the same period. Time to annual earnings announcements is the number of days between forecast and announcement, divided by 1000. The sample is limited to stocks for which past affiliation is possible (i.e., stocks with an IPO in the past five years or SEO in the past two years, and with at least three analysts covering the firm). The "All" columns include forecasts by all analysts, while the "Affiliated + Unaffiliated" columns include only analysts with at least one affiliated and one unaffiliated recommendation or forecast outstanding. Standard errors (in parentheses) are robust to arbitrary heteroskedasticity and within-analyst correlation. ***, **, and * mark significance at the 1%, 5%, and 10% levels respectively, using a one-tailed test for "Affiliation*(Forecast error for analyst's first forecast)" and two-tailed tests for all other coefficients. The sample period is 2/01/1994 to 12/31/2008.

Table 5 Relationship between Forecast Optimism and Recommendation Optimism

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Recommendation Optimism	0.1733	0.1764	0.1732	0.1728	0.1782	0.1799	0.3765	0.4273
	(0.1103)	(0.1104)	(0.1108)	(0.1104)	(0.1100)	(0.1108)	(0.4046)	(0.3872)
Affiliation	-0.5204	-0.5449	-0.5278	-0.5126	-0.5329	-0.5488	-0.5490	
	(0.4775)	(0.5370)	(0.4813)	(0.4565)	(0.4887)	(0.5212)	(0.5230)	
Affiliation*(Recommendation Optimism)	-0.6270**	-0.6282**	-0.6322**	-0.6252**	-0.6269**	-0.6312**	-0.5994**	
	(0.3519)	(0.3537)	(0.3540)	(0.3483)	(0.3519)	(0.3520)	(0.3548)	
Bank Reputation Capital		51.1550				33.5913	32.7149	52.2259
		(133.5067)				(118.7794)	(121.0151)	(134.6670)
Bank Loyalty Index			-1.0289*			-1.0455*	-1.0654*	-1.0382*
			(0.6139)			(0.6323)	(0.6346)	(0.6123)
Institutional Ownership				0.0013		0.0014	0.0013	0.0010
				(0.0045)		(0.0044)	(0.0043)	(0.0041)
All-Star Status					0.2910	0.3043	0.2818	0.2979
					(0.2915)	(0.2433)	(0.2447)	(0.2563)
(Bank Rep. Cap.)*(Recommendation Optimism)							47.5091	84.0885
							(153.9944)	(173.2109)
(Bank Loyalty Ind.)*(Recommendation Optimism)							-1.2991**	-1.2519**
							(0.6061)	(0.5837)
(Institutional Ownership)*(Recommendation Optimism)							0.0034	0.0026
							(0.0064)	(0.0062)
(All-Star Status)*(Recommendation Optimism)							-0.4175	-0.3887
							(0.3352)	(0.3454)
Investment-Banking Pressure								-0.7301
								(0.6798)
(Investment-Banking Pressure)*(Recommendation Optimism								-0.8639**
								(0.4921)
Fixed effects for year, month, and day-of-week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	6,269	6,269	6,269	6,269	6,269	6,269	6,269	6,269
R^2	0.0028	0.0028	0.0032	0.0028	0.0028	0.0033	0.0034	0.0036

The table presents results from OLS regressions with Forecast Optimism as the dependent variable. Forecast Optimism is defined as the difference between an annual earnings forecast and the consensus, divided by the prior-day stock price (and multiplied by 100). Recommendation Optimism is the difference between a recommendation and the consensus (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. Bank Reputation Capital is the underwriting market share of the analyst's bank, defined as the amount of equity the bank raised as the lead underwriter for its clients in the prior calendar year, divided by the total amount of equity raised by all issuers in that year. The Bank Loyalty Index applicable to an analyst of bank *j* in year *t* is the ratio of the number of companies which used bank *j* both in their last and in their penultimate deals to the number of companies which used bank *j* in their penultimate deals, based on all deals in the last five years. Institutional Ownership is calculated from quarterly 13(f) SEC filings. Analysts with All-Star Status are the top, "second team," and "third team" analysts in the most recent October issue of *Institutional Investor* magazine. Investment-Banking Pressure for an analyst's bank *j* covering firm *k* in year *t* is the sum of file amounts from all deals that bank *j* (and its predecessors in the case of mergers) managed for company *k* in the preceding five years, divided by the total file amount of *k*'s deals during the same period. The sample is limited to earnings forecasts within eighty days before the earnings announcement and to stocks with prices of at least $5 and for which past affiliation is possible (i.e., stocks with an IPO in the past five years or SEO in the past two years), and to cases where the analyst issues a recommendation and forecast simultaneously and analysts with at least one affiliated and one unaffiliated recommendation or forecast outstanding. Standard errors (in parentheses) are robust to heteroskedasticity and arbitrary within-analyst correlation. ***, **, and * mark significance at the 1%, 5%, and 10% levels respectively, using a one-tailed test for "Affiliated*(Recommendation Optimism)" and "(Investment-banking pressure)*(Recommendation Optimism)," and two-tailed tests for all other coefficients. The sample period is 2/01/1994 to 12/31/2008.

Table 6 Two-tongues metric

Panel A. Summary statistics

	Obs.	Mean	Median	St. dev.	25th %ile	50th %ile	75th %ile	% neg.	% pos.
Same-day recommendations (Regression Sample)									
All analysts	33,840	0.34	0.02	10.16	-0.25	0.02	0.47	42.90	55.71
Unaffiliated analysts	21,800	0.26	0.01	7.07	-0.26	0.01	0.45	43.65	54.99
Affiliated analysts	12,040	0.47	0.03	14.13	-0.22	0.03	0.50	41.53	57.01
p -value for difference in means, affiliated vs. unaffiliated:				0.0618					
Same-day and outstanding recommendations									
All analysts	166,106	0.38	0.07	7.49	-0.45	0.07	0.93	43.77	55.57
Unaffiliated analysts	101,001	0.34	0.05	7.18	-0.49	0.05	0.89	45.11	54.27
Affiliated analysts	65,105	0.43	0.11	7.95	-0.36	0.11	0.97	41.69	57.59
p -value for difference in means, affiliated vs. unaffiliated:				0.0116					

Panel B. Transition matrices

To	**From**					
	Whole sample		Affiliated analysts		Unaffiliated	
	Strategically distorted (measure 1 > 0)?					
	Yes	No	Yes	No	Yes	No
Same-day recommendations						
Same analyst, next forecast/rec if same stock	0.62	0.49				
Same analyst, next forecast/rec if different stock	0.55	0.51				
Same analyst, next forecast/rec if same stock			0.63	0.50	0.61	0.50
Same analyst, next forecast/rec if same stock - affiliated			0.63	0.50	0.50	0.63
Same analyst, next forecast/rec if same stock - unaffiliated			0.62	0.50	0.61	0.50
Same analyst, next forecast/rec if different stock			0.55	0.53	0.56	0.50
Same analyst, next forecast/rec if different stock - affiliated			0.56	0.54	0.57	0.53
Same analyst, next forecast/rec if different stock - unaffiliated			0.54	0.52	0.55	0.49
Same-day and outstanding recommendations						
Same analyst, next forecast/rec if same stock	0.75	0.34				
Same analyst, next forecast/rec if different stock	0.59	0.51				
Same analyst, next forecast/rec if same stock			0.75	0.35	0.75	0.34
Same analyst, next forecast/rec if same stock - affiliated			0.75	0.35	0.78	0.43
Same analyst, next forecast/rec if same stock - unaffiliated			0.58	0.41	0.75	0.34
Same analyst, next forecast/rec if different stock			0.60	0.52	0.58	0.50
Same analyst, next forecast/rec if different stock - affiliated			0.61	0.53	0.60	0.54
Same analyst, next forecast/rec if different stock - unaffiliated			0.58	0.50	0.57	0.49

The table presents statistics for the two-tongues measure of strategic distortion, defined as Recommendation Optimism minus scaled Forecast Optimism. The sample consists of all recent equity issuers (stocks with an IPO in the past five years or SEO in the past two years) with at least three analysts covering the firm, for analysts who have at least one affiliated and at least one unaffiliated forecast or recommendation outstanding. The "same-day recommendations" sample matches forecasts to recommendation by the same analyst for the same stock issued on the same day. The "same-day and outstanding recommendations" sample also allows for forecasts to be matched to outstanding recommendations by the same analyst and for the same stock, if none was made on the same day. Recommendation Optimism is defined as the analysts' recommendation minus the consensus recommendation as of the forecast date. Scaled forecast optimism is Earnings Forecast Optimism, defined as earnings per share forecast minus consensus, normalized by share price, multiplied by 100. The top portion of the table presents summary statistics; the bottom portion presents the rates of strategic distortion for subgroups of previous strategic (non-)distorters. "Same analyst, next forecast/rec if X" indicates the probability of strategic distortion of the next forecast/recommendation pair made by the same analyst as the "from" forecast/recommendation, if the next forecast/recommendation pair is for a stock that meets condition X.

Table 7 Analyst pressures and strategic distortion

	I(Two-tongues metric > 0)					
	(1)	(2)	(3)	(4)	(5)	(6)
Affiliation	0.1285**	0.1023***	0.0802***			
	(0.0535)	(0.0252)	(0.0207)			
Investment-Banking Pressure				0.1851***	0.1284***	0.0996***
				(0.0589)	(0.0278)	(0.0209)
Bank Reputation Capital	10.2901	-46.2436***	-23.6082***	5.5839	-47.8695***	-25.1606***
	(29.1014)	(14.0517)	(8.1221)	(29.0208)	(14.0449)	(8.1188)
Bank Loyalty Index	-0.1113	0.0327	0.0714***	-0.1181	0.0281	0.0706***
	(0.0984)	(0.0448)	(0.0238)	(0.0985)	(0.0448)	(0.0238)
Institutional Ownership	-0.0004	-0.0006	-0.0002	-0.0004	-0.0006	-0.0002
	(0.0009)	(0.0004)	(0.0002)	(0.0009)	(0.0004)	(0.0002)
All-Star Analyst	-0.0903	0.0086	-0.0296	-0.0944	0.0065	-0.0303
	(0.0925)	(0.0389)	(0.0261)	(0.0924)	(0.0389)	(0.0261)
Constant	0.1078*	0.1602***	0.1313***	0.0987	0.1572***	0.1300***
	(0.0654)	(0.0316)	(0.0168)	(0.0658)	(0.0316)	(0.0167)
Number of observations	6,256	33,840	156,739	6,256	33,840	156,739
χ^2	8.83	30.85	43.49	12.40	35.43	51.29
Pseudo R^2	0.0010	0.0007	0.0002	0.0014	0.0008	0.0010

The table presents results from estimation of a logit model for an indicator equal to 1 if the analyst is distorted (Two-tongues metric > 0), using the measure of strategic distortion defined in Table 6. The sample includes all firms with at least three analysts covering the firm and, in Columns 1 and 4, the same sample as in Table 5 (recent issuers, affiliated and unaffiliated analysts, forecasts within eighty days prior to the announcement); in Columns 2 and 5 we consider all firms, all analysts, and all forecasts. Standard errors (in parentheses) are robust to arbitrary heteroskedasticity and within-analyst and within-forecast-date correlation. ***, **, and * mark significance at the 1%, 5%, and 10% levels respectively, using two-tailed tests.

TABLE OA1. Summary Statistics

Panel A. Quarterly Earnings Forecasts and Long-Term Growth Forecasts

	Quarterly Earnings Forecast Optimism						Long Term Growth Forecast Optimism					
	Sample size	Mean	St. Dev.	Percentile 25th	50th	75th	Sample size	Mean	St. Dev.	Percentile 25th	50th	75th
Full Sample												
All	1,120,420	-0.044	1.992	-0.049	-0.001	0.031	217,645	0.76	80.58	-1.81	0.10	2.09
Unaffiliated	1,043,029	-0.043	2.011	-0.048	-0.001	0.031	200,775	0.82	83.70	-1.75	0.11	2.08
Affiliated	77,391	-0.059	1.722	-0.063	-0.002	0.034	16,870	-0.01	19.86	-2.50	0.00	2.19
Regression Sample												
All	18,970	-0.119	4.542	-0.054	-0.002	0.024	8,166	0.54	26.87	-2.50	0.00	2.35
Unaffiliated	12,426	-0.124	5.426	-0.048	-0.001	0.023	5,519	1.21	30.49	-2.50	0.00	2.67
Affiliated	6,544	-0.109	1.976	-0.068	-0.004	0.026	2,647	-0.87	16.93	-2.70	-0.07	1.95
Inv.-banking pressure = 0	12,364	-0.091	3.803	-0.049	-0.001	0.023	5,437	1.23	30.74	-2.50	0.00	2.67
Inv.-banking pressure > 0	6,606	-0.170	5.671	-0.066	-0.003	0.027	2,729	-0.83	16.61	-2.73	-0.10	2.00
Bank rep. capital = 0	5,765	-0.184	4.459	-0.052	-0.001	0.025	2,503	1.03	25.38	-2.52	0.00	2.60
Bank rep. capital > 0	13,205	-0.090	4.577	-0.055	-0.002	0.024	5,663	0.32	27.50	-2.50	0.00	2.27
Bank loyalty index = 0	5,215	-0.053	1.011	-0.056	-0.001	0.022	2,457	-0.03	20.18	-2.03	0.00	2.00
Bank loyalty index > 0	13,755	-0.144	5.297	-0.053	-0.002	0.025	5,709	0.78	29.28	-2.73	0.00	2.50
Instit. ownership = 0	291	0.023	0.485	-0.062	0.000	0.051	130	0.56	9.12	-1.33	-0.04	1.00
Instit. ownership > 0	18,679	-0.121	4.577	-0.054	-0.002	0.024	8,036	0.54	27.06	-2.54	0.00	2.38
All-star analyst = 0	17,529	-0.125	4.714	-0.054	-0.002	0.024	7,407	0.53	27.87	-2.62	0.00	2.50
All-star analyst = 1	1,441	-0.037	1.122	-0.054	-0.003	0.025	759	0.60	13.67	-1.83	-0.09	1.67

Quarterly Earnings Forecast Optimism is measured as the value of the quarterly earnings forecast minus the existing consensus, normalized by prior-day share price, where quarterly earnings forecasts are reported in earnings-per-share dollars. Long-Term Growth Forecast Optimism is measured as the forecast value minus the existing consensus, where long-term growth forecasts are reported in percent of expected growth over the next three to five years. The Full Sample includes all recommendations and forecasts as long as the underlying share price is at least $5 and at least three analysts are covering the firm. An analyst is Unaffiliated if his or her brokerage firm does not belong to a bank that has been lead or co-underwriter in the stock's IPO over the past 5 years or SEO over the past 2 years; otherwise the analyst is Affiliated. The Regression Sample reduces heterogeneity between Unaffiliated and Affiliated analysts and the stocks they cover by requiring (i) that the analyst is simultaneously affiliated (for some stocks) and unaffiliated (for some other stocks); (ii) that affiliation is possible for the stock receiving the recommendation or forecast (i.e., the firm had at least one IPO in the past 5 years or SEO in the past 2 years); (iii) that recommendation and forecast are issued on the same day. Investment-banking pressure for an analyst's bank j covering firm k in year t is the sum of file amounts from all deals that bank j (and its predecessors in the case of mergers) managed for company k in the preceding five years, divided by the total file amount of k's deals during the same period. Bank reputation capital is the underwriting market share of the analyst's bank, defined as the amount of equity the bank raised as the lead underwriter for its clients in the prior calendar year divided by the total amount of equity raised by all issuers in that year. The Bank loyalty index applicable to an analyst of bank j in year t is the ratio of the number of companies which used bank j both in their last and in their penultimate deals to the number of companies which used bank j in their penultimate deals, based on all deals in the last five years. Institutional ownership is calculated from quarterly 13(f) SEC filings. All-star analysts are the top, "second team" and "third team" analysts in the most recent October issue of the *Institutional Investor Magazine*. The quarterly earnings forecast sample is limited to forecasts pertaining to the closest following quarterly earnings announcement, and to earnings announcements that occur during the SEC mandated window of 0-45 days after the end of the relevant fiscal quarter. The sample period is 2/01/1994 to 12/31/2008.

TABLE OA1. (*continued*)

Panel B. Measures of Trade Reaction

	All dates			Quarterly earnings forecast dates			Long-term growth forecast dates		
	Mean	Med.	St.Dev.	Mean	Med.	St.Dev.	Mean	Med.	St.Dev.
Number of small buy-initiated trades	48.27	15	92.12	106.48	44	147.69	98.13	39	140.37
Number of large buy-initiated trades	23.52	3	67.74	70.22	21	128.64	69.15	20	127.18
Number of small sell-initiated trades	42.07	15	79.23	89.31	39	126.11	84.33	36	121.68
Number of large sell-initiated trades	19.44	3	55.77	57.17	18	105.12	57.27	17	106.28
Total number of small buy/sell-initiated trades	90.34	30	168.61	195.80	84	269.23	182.46	77	257.70
Total number of large buy/sell-initiated trades	42.97	6	122.63	127.38	40	232.03	126.42	37	231.75
Δ(buy-sell) initiated small trades	6.20	1	33.13	17.17	4	54.27	13.80	3	51.07
Δ(buy-sell) initiated large trades	4.08	0	18.98	13.05	2	36.87	11.88	2	35.09
N	*3,730,866*			*412,993*			*126,521*		

Trade reaction is measured as the abnormal trade imbalance. Large traders represent trades of at least $50,000; small traders represent trades of less than $20,000. The sample is limited to stocks for which past affiliation is possible, i.e., stocks with an IPO in the past 5 years or SEO in the past 2 years. The sample period is 2/01/1994-12/31/2002.

TABLE OA2. Timing

Panel A. Sample Statistics

	Mean (median) number of days until new forecast (same stock + analyst)			
Quarterly Earnings Forecasts		Relative to Consensus		
	Overall	Below	Equal to	Above
Unaffiliated	39.6	38.9	45.6	39.7
	(37)	(36)	(44)	(38)
Affiliated	39.5	38.8	44.8	39.6
	(37)	(36)	(46)	(38)
Long-Term Growth Forecasts		Relative to Consensus		
	Overall	Below	Equal to	Above
Unaffiliated	285.7	289.3	336.6	279.6
	(175)	(179)	(231)	(168)
Affiliated	293.2	297.1	355.0	285.6
	(174)	(179)	(240)	(164)

Panel B. Regression Analysis

	Quarterly Earnings Forecast	Long-Term Growth Forecast
Above consensus	39.74***	279.65***
	(0.33)	(3.56)
Equal to consensus	45.56***	336.56***
	(0.91)	(13.27)
Below consensus	38.95***	289.31***
	(0.34)	(3.55)
(Above consensus) *(Affiliation)	-0.15	5.97
	(0.36)	(5.15)
(Equal to consensus) *(Affiliation)	-0.75	18.44
	(1.13)	(21.74)
(Below consensus) *(Affiliation)	-0.11	7.75
	(0.35)	(5.02)
Number of Observations	52,378	41,562
R^2	0.70	0.44

Panel A presents summary statistics for the number of days until the next quarterly earnings forecast or long-term growth forecast by the same analysts for the same stock. Panel B presents results from OLS regressions of the number of days until the next quarterly earnings forecast or long-term growth forecast by the same analyst for the same stock on forecast controls and their interactions with affiliation dummies. Standard errors (in parentheses) are robust to arbitrary heteroskedasticity and within-date correlation. ***, **, and * mark significance at the 1%, 5% and 10% levels respectively. For both panels, the sample is limited to analysts with possible affiliation, i.e., to analysts who have at least one affiliated and at least one unaffiliated recommendation or forecast outstanding, and to firms with possible affiliation, i.e., to firms with an IPO in the past 5 years or an SEO in the past 2 years, and with at least 3 analysts covering the stock, and excludes reiterations. The sample period is 2/01/1994 to 12/31/2008.

TABLE OA3. Trade Reaction to Quarterly Earnings Forecasts, Long-Term Growth Forecasts and Quarterly Earnings Surprises

Panel A. Reaction to Analyst Updates

		Quarterly Earnings Forecasts			Long-Term Growth Forecasts		
		Small Traders	Large Traders	Difference (S-L)	Small Traders	Large Traders	Difference (S-L)
Unaffiliated	Update	-1.2098	4.0183**	-5.2281**	0.0034	0.0046**	-0.0012
		(1.5670)	(1.6345)	(2.2643)	(0.0023)	(0.0018)	(0.0030)
	Constant	0.1338***	-0.0202	0.1539***	0.1083***	-0.0130	0.1212***
		(0.0190)	(0.0177)	(0.0260)	(0.0237)	(0.0203)	(0.0312)
Number of Observations		12,014	12,014		6,311	6,311	
	R^2	0.0001	0.0010		0.0004	0.0009	
Affiliated	Update	-2.5921**	2.0335	-4.6256*	-0.0018	0.0040	-0.0058
		(1.1900)	(1.5344)	(1.9417)	(0.0038)	(0.0044)	(0.0058)
	Constant	0.1738***	-0.0366	0.2104***	0.1379***	0.0573*	0.0806*
		(0.0253)	(0.0222)	(0.0337)	(0.0358)	(0.0324)	(0.0483)
Number of Observations		5,314	5,314		2,099	2,099	
	R^2	0.0007	0.0005		0.0001	0.0005	

Panel B. Reaction to Quarterly Earnings Surprises

	Small Traders	Large Traders	Difference (S-L)	Small Traders	Large Traders	Difference (S-L)
Analyst-Based Surprise	3.5291**	6.7238***	-3.1947	0.7476	3.9861**	-3.2385
	(1.5412)	(1.9459)	(2.4823)	(1.6143)	(1.5780)	(2.2574)
Analyst-Based "Meet or Beat" Dummy				0.0785***	0.1180***	-0.0395
				(0.0219)	(0.0197)	(0.0295)
Seasonal-Random-Walk (SRW)-Based Surprise	0.0654	-0.0800	0.1455	-0.1371	-0.0775	-0.0596
	(0.0932)	(0.0957)	(0.1336)	(0.1278)	(0.0955)	(0.1595)
SRW-Based "Meet or Beat" Dummy				0.1137***	-0.0101	0.1238***
				(0.0222)	(0.0194)	(0.0295)
Constant	0.1815***	0.0589***	0.1226***	0.0561**	-0.0131	0.0692**
	(0.0142)	(0.0117)	(0.0184)	(0.0228)	(0.0192)	(0.0299)
Number of Observations	25,131	25,133		25,131	25,133	
R^2	0.0002	0.0008		0.0024	0.0024	

Panel A shows results from OLS regressions of trade reaction on quarterly earnings forecast and long-term growth forecast update values. Panel B shows results from OLS regressions of trade reaction on quarterly earnings surprise values. 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. For consistency with the other analyses, the sample is further limited to stocks for which past affiliation is possible, i.e., stocks with an IPO in the past 5 years or SEO in the past 2 years. In Panel A, Quarterly forecast update is the difference between a forecast and the prior forecast by the same analyst for the same firm, normalized by share price (and multiplied by 100). Long-term growth forecast update is the difference between the percentage growth forecast and the prior forecast by the same analyst for the same firm. The sample is further limited to stocks for which both small and large trade is defined (i.e. stock price of at most $200), and with at least 3 analysts covering the firm. For Panel B, Analyst-Based Surprise is calculated as the announced value of quarterly earnings (from IBES) minus the most recent consensus forecast, normalized by share price twenty trading days before the earnings announcement. (We require that the earnings announcement date from Compustat be within two days of the IBES earnings announcement date.) In both panels, standard errors (in parentheses) are robust to arbitrary heteroskedasticity and within-day correlation. ***, **, and * mark significance at the 1%, 5% and 10% levels respectively. The sample period is 2/01/94-12/31/02.

TABLE OA4. Analyst Forecast Walk-Down for Quarterly Earnings Forecasts

	All	All	Aff. + Unaff.	Aff. + Unaff.
Affiliated	-0.0002		-0.0001	
	(0.0003)		(0.0003)	
Error in analyst's first forecast	0.6155***	0.5995***	0.4736**	0.4314**
	(0.1648)	(0.1682)	(0.2143)	(0.2157)
Affiliation*(Error for analyst's first forecast)	0.0467		0.1607	
	(0.2209)		(0.2245)	
All-star Analyst	0.0001	0.0001	0.0003*	0.0003*
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Bank Reputation	0.0523	0.0659	0.0704	0.0840
	(0.0789)	(0.0802)	(0.0810)	(0.0811)
Loyalty Index	0.0003	0.0003	0.0000	0.0001
	(0.0005)	(0.0005)	(0.0006)	(0.0006)
Institutional Ownership	0.0000***	0.0000***	0.0000***	0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
All-star Analyst*(Error first forecast)	0.2777***	0.3130***	0.4389***	0.4843***
	(0.1076)	(0.1142)	(0.1545)	(0.1508)
Bank Reputation*(Error first forecast)	-72.2014	-78.0550	-51.5735	-55.4529
	(98.7728)	(101.2482)	(116.0147)	(119.9789)
Loyalty Index*(Forecast error first forecast)	-0.0081	0.0231	0.2246	0.2931
	(0.3496)	(0.3467)	(0.4035)	(0.3900)
Institutional Ownership*(Error first forecast)	0.0010	0.0004	0.0000	-0.0008
	(0.0026)	(0.0029)	(0.0038)	(0.0042)
Investment Banking Pressure		-0.0003		-0.0003
		(0.0003)		(0.0003)
(Inv. Banking Pr.)*(Error first forecast)		0.1660		0.3159
		(0.2031)		(0.1995)
Time to annual earnings announcement	0.0316***	0.0312***	0.0322***	0.0315***
	(0.0033)	(0.0034)	(0.0034)	(0.0035)
Constant	-0.0039***	-0.0039***	-0.0042***	-0.0042***
	(0.0004)	(0.0004)	(0.0005)	(0.0005)
Number of Observations	207,739	207,739	138,475	138,475
R^2	0.5975	0.6026	0.5922	0.6098

Ordinary least squares regression of analysts' errors in their last forecast for a given firm's earnings in a given fiscal quarter. Forecast error is defined as the earnings forecast minus the earnings realization, normalized by share price before the analyst's first forecast for the firm-quarter. Affiliation is a dummy equal to 1 if the analyst is affiliated in the given stock at the given point in time. Time to quarterly earnings announcements is the number of days between the forecast and the announcement, divided by 1000. All-star analysts are the top, "second team" and "third team" analysts in the most recent October issue of Institutional Investor magazine. Bank reputation capital is the underwriting market share of the analyst's bank, defined as the amount of equity the bank raised as the lead underwriter for its clients in the prior calendar year divided by the total amount of equity raised by all issuers in that year. The Bank loyalty index applicable to an analyst of bank j in year t is the ratio of the number of companies which used bank j both in their last and in their penultimate deals to the number of companies which used bank j in their penultimate deals, based on all deals in the last five years. Institutional ownership is calculated from quarterly 13(f) SEC filings. Investment-banking pressure for an analyst's bank j covering firm k in year t is the sum of file amounts from all deals that bank j (and its predecessors in the case of mergers) managed for company k in the preceding five years, divided by the total file amount of k's deals during the same period. The sample is limited to stocks for which past affiliation is possible, i.e., stocks with an IPO in the past 5 years or SEO in the past 2 years, with at least 3 analysts covering the firm. The "All Analysts" column includes forecasts made by any analyst, while the "Currently Affiliated and Unaffiliated Analysts" column includes only analysts with at least one unaffiliated recommendation or forecast outstanding and one affiliated recommendation or forecast outstanding. Standard errors (in parentheses) are robust to arbitrary heteroskedasticity and within-analyst correlation. ***, **, and * mark significance at the 1%, 5% and 10% levels respectively, using a 1-tailed test for "Affiliation*(Forecast error for analyst's first forecast)" and 2-tailed tests for all other coefficients. The sample period is 2/01/94-12/31/08.

TABLE OA5. Relationship between Quarterly Earnings Forecast Optimism and Recommendation Optimism

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Recommendation Optimism	0.1339	0.1345	0.1367	0.1339	0.1329	0.1353	-0.0868	0.2198
	(0.2312)	(0.2312)	(0.2314)	(0.2312)	(0.2316)	(0.2320)	(0.4240)	(0.4705)
Affiliation	0.0358	0.0320	0.0188	0.0335	0.0544	0.0382	0.0059	
	(0.0854)	(0.0853)	(0.0846)	(0.0840)	(0.0947)	(0.0946)	(0.0644)	
Affiliation*(Recommendation Optimism)	-0.0691	-0.0700	-0.0696	-0.0684	-0.0670	-0.0674	0.1160	
	(0.2396)	(0.2396)	(0.2396)	(0.2397)	(0.2403)	(0.2405)	(0.2072)	
All-star Analyst		0.0879**				0.0573	0.0551	0.0602
		(0.0443)				(0.0455)	(0.0422)	(0.0464)
Bank Reputation			34.2549**			22.3764	11.3729	23.4610*
			(14.8647)			(14.5638)	(12.9286)	(13.6899)
Loyalty Index				-0.1032		-0.0922	-0.1496	-0.0962
				(0.1178)		(0.1153)	(0.1060)	(0.1167)
Institutional Ownership					0.0034*	0.0033*	0.0032**	0.0034*
					(0.0020)	(0.0020)	(0.0016)	(0.0020)
All-star Analyst*(Recommendation Optimism)							-0.0092	-0.0594
							(0.1234)	(0.1371)
Bank Reputation*(Recommendation Optimism)							-39.5235	-84.4319
							(46.8336)	(51.7837)
Loyalty Index*(Recommendation Optimism)							0.1066	0.9038
							(0.5646)	(0.6513)
Institutional Ownership*(Recommendation Optimism)							0.0007	-0.0048
							(0.0062)	(0.0067)
Investment Banking Pressure								0.0024
								(0.0852)
(Investment Banking Pressure)*(Recommendation Optimism)								-0.1622
								(0.2529)
Fixed Effects for year, month and day-of-week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	14,989	14,989	14,989	14,989	14,989	14,989	25,301	14,989
R^2	0.0019	0.0020	0.0020	0.0020	0.0023	0.0023	0.0017	0.0031

The table presents results from OLS regressions. Quarterly earnings forecast optimism is defined as the difference between a quarterly earnings forecast and the consensus, divided by the stock price on the day prior to the forecast date (and multiplied by 100). 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. All-star analysts are the top, "second team" and "third team" analysts in the most recent October issue of Institutional Investor magazine. Bank reputation capital is the underwriting market share of the analyst's bank, defined as the amount of equity the bank raised as the lead underwriter for its clients in the prior calendar year divided by the total amount of equity raised by all issuers in that year. The Bank loyalty index applicable to an analyst of bank j in year t is the ratio of the number of companies which used bank j both in their last and in their penultimate deals to the number of companies which used bank j in their penultimate deals, based on all deals in the last five years. Institutional ownership is calculated from quarterly 13(f) SEC filings. Investment-banking pressure for an analyst's bank j covering firm k in year t is the sum of file amounts from all deals that bank j (and its predecessors in the case of mergers) managed for company k in the preceding five years, divided by the total file amount of k's deals during the same period. The sample is limited to earnings forecasts within 80 days before the earnings announcement and to stocks with prices of at least $5 and for which past affiliation is possible, i.e., stocks with an IPO in the past 5 years or SEO in the past 2 years, and to cases where the analyst issues a recommendation and forecast simultaneously. Standard errors (in parentheses) are robust to heteroskedasticity and arbitrary within-analyst correlation. ***, **, and * mark significance at the 1%, 5% and 10% levels respectively, using a 1-tailed test for "Affiliated*(Recommendation Optimism)" and "(Investment Banking Pressure)*(Recommendation Optimism)" and 2-tailed tests for all other coefficients. The sample period is 2/01/94 to 12/31/08.

TABLE OA6. Relationship between Long-term Growth Forecast Optimism and Recommendation Optimism

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Recommendation Optimism	1.5990**	1.6013**	1.6006**	1.5933**	1.5969**	1.5941**	1.5068	1.6623
	(0.6532)	(0.6528)	(0.6537)	(0.6525)	(0.6535)	(0.6528)	(1.6232)	(1.5987)
Affiliation	-2.0787***	-2.0896***	-2.1942***	-2.0522***	-2.0538***	-2.1506***	-2.1572***	
	(0.5867)	(0.5836)	(0.6234)	(0.5837)	(0.6291)	(0.6635)	(0.6644)	
Affiliation*(Recommendation Optimism)	-0.1505	-0.1482	-0.1636	-0.1619	-0.1572	-0.1816	0.0385	
	(0.8355)	(0.8359)	(0.8362)	(0.8363)	(0.8366)	(0.8389)	(0.8739)	
All-star Analyst		0.2979				0.1924	0.1784	0.1916
		(0.5974)				(0.6122)	(0.6004)	(0.6008)
Bank Reputation			197.6167			203.6461	220.0580	233.3426
			(246.7340)			(254.6704)	(255.4664)	(258.5232)
Loyalty Index				1.1882		1.2546	1.2501	1.2961
				(1.0227)		(1.0119)	(1.0129)	(1.0152)
Institutional Ownership					0.0042	0.0045	0.0047	0.0043
					(0.0137)	(0.0135)	(0.0136)	(0.0136)
All-star Analyst*(Recommendation Optimism)							-2.1488	-2.1594
							(1.8188)	(1.8208)
Bank Reputation*(Recommendation Optimism)							-349.5584	-308.8471
							(410.9465)	(410.5216)
Loyalty Index*(Recommendation Optimism)							1.3526	1.3798
							(1.5100)	(1.5120)
Institutional Ownership*(Recommendation Optimism)							-0.0007	-0.0018
							(0.0180)	(0.0179)
Investment Banking Pressure								-2.5160***
								(0.7653)
(Investment Banking Pressure)*(Recommendation Optimism)								-0.3505
								(0.9996)
Fixed Effects for year, month and day-of-week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	8,166	8,166	8,166	8,166	8,166	8,166	8,166	8,166
R^2	0.0145	0.0145	0.0145	0.0146	0.0145	0.0147	0.0149	0.0150

This table presents results from OLS regressions. Long-term growth forecast optimism is defined as the difference between a long-term growth forecast and the consensus. 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. All-star analysts are the top, “second team” and “third team” analysts in the most recent October issue of Institutional Investor magazine. Bank reputation capital is the underwriting market share of the analyst’s bank, defined as the amount of equity the bank raised as the lead underwriter for its clients in the prior calendar year divided by the total amount of equity raised by all issuers in that year. The Bank loyalty index applicable to an analyst of bank j in year t is the ratio of the number of companies which used bank j both in their last and in their penultimate deals to the number of companies which used bank j in their penultimate deals, based on all deals in the last five years. Institutional ownership is calculated from quarterly 13(f) SEC filings. Investment-banking pressure for an analyst’s bank j covering firm k in year t is the sum of file amounts from all deals that bank j (and its predecessors in the case of mergers) managed for company k in the preceding five years, divided by the total file amount of k’s deals during the same period. The sample is limited to earnings forecasts within 80 days before the earnings announcement and to stocks with prices of at least $5 and for which past affiliation is possible, i.e., stocks with an IPO in the past 5 years or SEO in the past 2 years ("Analysts with affiliation in some stocks, firms with possible affiliation"), where those analysts issue a recommendation and forecast simultaneously. Standard errors (in parentheses) are robust to heteroskedasticity and arbitrary within-analyst correlation. ***, **, and * mark significance at the 1%, 5% and 10% levels respectively, using a 1-tailed test for "Affiliated*(Recommendation Optimism)" and "(Investment Banking Pressure)*(Recommendation Optimism)", and 2-tailed tests for all other coefficients. The sample period is 2/01/94-12/31/08.