Do Conference Calls Affect Analysts' Forecasts?

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ABSTRACT: In 1998, the SEC expressed concern that conference calls encourage selective disclosure by revealing new information to financial analysts privy to the call. This study investigates whether the regular use of earnings-related conference calls increases the amount of information available to financial analysts by examining the effect of conference calls on analysts' forecast error and dispersion. Results indicate that conference calls increase analysts' ability to forecast earnings accurately, suggesting that these calls increase the total information available about a firm. We also find some evidence that conference calls decrease dispersion among analysts. Given conference calls were generally restricted during our sample period, our evidence suggests that conference calls may have contributed to an information gap between analysts privy to the call and the remainder of the investment community.

We also investigate whether conference calls differentially affect analysts' forecast errors depending on analysts' prior forecasting ability or brokerage-house affiliation. We find evidence suggesting that analysts with relatively weak prior forecasting performance benefit more from conference calls, suggesting that conference calls help "level the playing field" across analysts.

Key words: Conference calls, Security analysts, Forecast error, Forecast dispersion, Disclosure, Information environment, Reg FD

Data availability: Data are commercially available from the sources identified in the text.

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I. INTRODUCTION

Conference calls are a common method senior management uses to communicate with financial analysts. A 1998 study by the National Investor Relations Institute (NIRI) reports that, of the member firms surveyed, 82 percent use conference calls – up from 61 percent reported in a similar survey conducted in 1995 (NIRI 1998a). Despite the increasing popularity of conference calls, there is little empirical evidence on the effects of these calls on their primary audience – financial analysts. This study examines the effects of conference calls on analysts' earnings forecasts before the SEC issued Regulation Fair Disclosure (S7-31-19) in August 2000 (hereafter Reg FD).[1]

During the 1998 "SEC Speaks" Conference, SEC Chairman Arthur Levitt expressed concern that analyst calls (including conference calls) represent *increased disclosure* and therefore put the general public at a competitive disadvantage in the search for information. Whether conference calls represent *increased disclosure* or simply a *new method* of disclosure is an empirical question. *Increased disclosure* means that the firm releases new, material information (or that call participants infer new information from the interaction with management during the call). Alternatively, conference calls may represent merely a *new method* of disclosure in that the same information

[1] Although conference calls were originally directed at financial analysts and large investors, the increasing popularity of equity investing in the mid to late 1990's likely increased the demand among individual investors to listen to these calls. For example, in March 1999, Bestcalls.com launched a website publicizing the dates and times of conference calls open to individual investors. However, firms still maintained control over call participants and many elected not to allow individuals access to their calls. Around the same time, some firms began live broadcasts of their conference calls via the Internet (webcasts). These calls are obviously open to all listeners, including the financial press. Given the sample period used in this study, individuals were unlikely to be allowed access to the conference calls examined in this study. Bushee, Matsumoto, and Miller (2001) examine a sample of conference calls open to individual investors and investigate the determinants and effects of allowing unlimited access to conference calls either via telephone or webcast.

released in a conference call is available through other sources (e.g., individual discussions, press releases), although perhaps with different timing.[2]

Increased disclosure leads to *selective disclosure* when the new information is available to some, but not all, capital market participants. To the extent that analysts were the primary audience for conference calls, new information released during these calls would represent selective disclosure.[3] Thus, we investigate whether conference calls reveal new information, one necessary condition for selective disclosure to occur.

Concern about selective disclosure influenced the SEC to pass Reg FD, which requires that (1) when an issuer intentionally discloses material information, it do so through public disclosure, not through selective disclosure; and (2) whenever an issuer learns that it has made a non-intentional material selective disclosure, the issuer make prompt public disclosure of that information (www.sec.gov/rules/proposed/34-42259.htm). Our investigation of conference calls as one potential source of selective disclosure contributes to the ongoing controversy surrounding the passage of Reg FD.

We evaluate whether conference calls represent increased disclosure by examining their effect on two properties of analysts' forecasts – forecast error and forecast dispersion. If regular use of earning-related conference calls increases disclosure (i.e., management discloses additional information during conference calls that is not otherwise disclosed to analysts), conference calls should lead to lower forecast error and forecast dispersion in the period around the call. For our cross-sectional tests, we compute the change in forecast error and the change in forecast dispersion during a quarter, and compare the change in error and the change in dispersion between firms

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[2] For example, Lou Thompson, president of NIRI, argued that conference calls simply provide perspective and explanation of the fundamental news previously released in an earnings announcement (NIRI Symposium on Corporate Disclosure, 1998).

[3] A NIRI study dated February 2000 reports that, of firms hosting conference calls, 82% allow individual investors real-time access versus 27% in 1998, and 74% allow the financial press access versus only 14% in 1998.

hosting conference calls that quarter and firms not hosting conference calls. For our within-firm tests, we compare the change in forecast error and the change in dispersion before and after each firm begins to regularly host conference calls.

Cross-sectional tests reveal that the average error in analysts' forecasts declines more in conference call quarters than in non-conference call quarters. Further, the relatively greater decrease in error for conference call quarters persists through the next earnings announcement date, suggesting a sustained information advantage. These results are robust to a number of controls and sensitivity checks. Our within-firm tests provide similar, though somewhat weaker, results. For a sub-sample of firms that regularly host conference calls, forecast error declines more in quarters after the firm begins hosting conference calls than in earlier quarters before the firm used conference calls.

Similar to our findings for forecast error, our cross-sectional tests on forecast dispersion indicate that dispersion in analysts' forecasts tends to decrease during the quarter for all firms, but that the decrease in dispersion is *relatively* greater in conference call quarters than in non-conference call quarters. Also, this relatively greater decrease in dispersion persists through the next earnings announcement date – again consistent with a sustained effect on the information environment. However, the results of our within-firm tests are not statistically significant.

We next investigate whether conference calls "level the playing field" across analysts by testing whether the decrease in forecast error associated with conference calls differs across analyst types. Analysts with superior forecasting ability or affiliated with more prestigious brokerage firms may receive differential benefits from conference calls than analysts with relatively less ability or less prestigious affiliation. We compare the change in error for these different types of analysts and examine the effect of conference calls across types. We find that both types of analysts benefit from

conference calls, but analysts with relatively weaker prior forecasting ability appear to benefit more from conference calls.

Given the controversy surrounding Reg FD, evidence on the effect of conference calls on capital market participants is important from a policy perspective. Our evidence suggests that conference calls increase the information available to analysts. Given that firms generally restricted public access to conference calls during our sample period, our results suggest that conference calls likely contributed to an information gap between analysts privy to the call and the remainder of the investment community, consistent with the SEC's concerns.

From an academic perspective, our study provides new evidence on the effects of disclosure on analysts' forecasts. Lang and Lundholm (1996) find that higher Financial Analyst Federation ratings of firms' disclosure policies are associated with more accuracy and less dispersion in analysts' forecasts. In contrast, Healy, Hutton, and Palepu (1999) do not find a significant relation between forecast dispersion and sustained increases in firms' disclosure policies (measured by analysts' ratings of firms' disclosures from the Association of Investment Management and Research). Our study differs from Lang and Lundholm (1996) and Healy et al. (1999) in that we are able to better isolate the (potential) disclosure event and more precisely measure the effect of the conference call event on analysts' forecasts. Two other studies focus more precisely on the effects of specific disclosure events on analysts' forecasts. Barron, Kile, and O'Keefe (1999) find that high quality disclosures in the management discussion and analysis (MD&A) section of the 10-K are associated with more accurate forecasts and lower dispersion; however, Francis, Hanna, and Philbrick (1997) find that managers' presentations to security analysts have no effect on analysts' forecast error or dispersion. These seemingly conflicting results suggest that not all disclosure events or measures have similar effects on analysts' forecasts. Our results suggest that conference calls are an important disclosure event, at least before the passage of Reg FD.

In the next section, we develop empirical predictions. Section three discusses sample selection criteria and the research design. Section four presents empirical results on the effect of conference calls on forecast error and dispersion. Section five presents similar results for different types of analysts. The last section offers concluding remarks.

II. DEVELOPMENT OF EMPIRICAL PREDICTIONS

The fact that analysts participate in conference calls suggests that calls provide material information that is potentially useful for forecasting future earnings and making stock recommendations. However, it is possible that conference calls simply expand on previously released news or partially replace other mechanisms for disclosure (e.g., one-on-one conversations with analysts).[4] Thus, empirical evidence is necessary to assess whether conference calls provide new information.

Prior evidence suggests that managers disclose at least some information during conference calls. Frankel et al. (1999) find unusually high levels of return volatility and trading volume during conference call periods. Their findings provide indirect evidence suggesting that conference calls introduce new, material information to the analyst community.[5] Further, SEC concerns about selective disclosure during our sample period, and the subsequent adoption of Reg FD, suggest that managers may have released information during conference calls. Thus, given prior academic evidence and regulatory concerns, we predict that conference calls result in the release of material new information.

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[4] Anecdotal reports suggest a significant amount of one-on-one phone interaction exists between analysts and managers (McCafferty 1997). In a survey conducted prior to 1981, analysts ranked "interviews with company executives" as the most important source of information about specific companies, and 65 percent of the companies surveyed provided some assistance to security analysts (Lees 1981). Thus, it is possible that firms not using conference calls provide the same information to analysts via other means such as press releases and one-on-one phone conversations.

[5] Frankel et al. recognize that their tests establish primarily a timing advantage associated with conference calls, and do not necessarily demonstrate a sustained increase in information.

To generate specific empirical predictions regarding the effect of conference calls on analysts' forecasts, we use the framework developed by Barron, Kim, Lim, and Stevens (1998) (hereafter BKLS), which expresses two observable properties of analysts' forecasts – error in the mean consensus forecast and dispersion in individual forecasts – as functions of the amount or "precision" of analysts' public and private information.[6] In the BKLS framework, analysts receive information about earnings – both public information that is common across all analysts and private information that is idiosyncratic and uncorrelated across analysts. If firms provide additional information during conference calls, then conference calls increase the precision of public information.

Although it is intuitive that more precise public information should decrease error in the mean forecast, this prediction is not directly implied in the BKLS framework. To the extent that more precise public information reduces uncertainties about the firm's future prospects, increased precision in public information decreases forecast error. However, if the increased precision in public information also leads analysts to rely less on private information, forecast error could actually increase (because the errors in private signals are uncorrelated by definition, and therefore, tend to cancel out when averaged across many analysts). Thus, the extent to which increased precision in public information increases or decreases the error in the mean forecast depends on the precision of public relative to private information, and the number of individual analysts contributing to the mean consensus forecast. For reasons discussed in the Appendix, we argue that the effect of decreased uncertainty dominates and thus, if conference calls increase the precision of public information, we expect these calls to be associated with decreased error in analysts' earnings forecasts.[7] Our first empirical prediction (P1) is as follows:

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[6] Appendix A provides a detailed discussion of the BKLS framework and implications for our predictions.

[7] We expect the effect of increased precision of public information to outweigh the effect of reduced diversification because we argue that public information is on average more precise than private information. Disclosures provided by

P1: Forecast error will decrease more during conference call quarters than during non-conference call quarters.

The effect of increased precision on forecast dispersion is more straightforward in the BKLS framework – increased precision in public information decreases the dispersion in analysts' forecasts. Thus, if conference calls increase the precision of public information, these calls should also be associated with decreased dispersion, leading to our second empirical prediction (P2):

P2: Forecast dispersion will decrease more during conference call quarters than during non-conference call quarters.

III. RESEARCH DESIGN

Dependent Variables

The general form of each dependent variable is the scaled change in the forecast characteristic – error (ERROR) or dispersion (DISP) – before and after a conference call:

$$\frac{\text{post-conference call measure} - \text{pre-conference call measure}}{\text{stock price at pre-conference call date}}$$

We measure forecast error for each firm-quarter as the absolute value of the difference between the mean of analysts' estimates and actual earnings per share for a given quarter.[8] We measure dispersion for each firm-quarter as the standard deviation of analysts' individual forecast estimates. Post versus pre differences isolate the effects of the conference call and control for differences in the *levels* of forecast error and dispersion across firms. If forecast error decreases following conference calls, the post-call forecast error will be less than the pre-call forecast error and the scaled change in forecast error (ERROR) will be negative. Similarly, if forecast dispersion decreases following conference calls, the scaled change in forecast dispersion (DISP) will be

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the firm such as annual reports, quarterly filings, and earnings announcements, are examples of important public information. In addition, the BKLS framework would consider any *common* information disclosed privately to all analysts to be effectively public information.

[8] In the BKLS framework, error in the mean forecast is defined as the squared difference between the mean analyst forecast and actual earnings. We use the absolute difference rather than squaring the differences because squaring places greater weight on large forecast errors. However, our main results hold using squared differences.

negative. Figure 1 illustrates the timeline of events and describes the measurement of the dependent variables in detail.

The *pre-conference call* component of the dependent variables is the forecast error or forecast dispersion for quarter t measured at the end of quarter t-1 (i.e., beginning of quarter t). We consider quarter t a conference call quarter if the firm hosts a conference call relating to the announcement of quarter t-1's earnings. Prior research (and evidence in Table 1 discussed below) suggests that firms typically host conference calls following a quarterly earnings release (Tasker 1998 and Frankel et al. 1999). During this conference call, management discusses earnings for the prior quarter (quarter t-1) and provides analysts with information potentially useful in forecasting earnings for the upcoming quarter (quarter t). While the conference call content may also help analysts forecast future quarters' earnings (in t+1, t+2, etc.), the conference call information likely has the greatest influence on analysts' forecasts of quarter t's earnings.

We measure *post-conference call* forecast error or forecast dispersion at two alternative points in time, resulting in two dependent variables for each prediction. As Figure 1 depicts, we take the first post-call measures (ERROR1 and DISP1) 20 calendar days after the quarter t-1 earnings announcement. This measure forms a relatively narrow window around conference calls, and we intend it to isolate the effects of the calls by capturing differences in information dissemination between conference call and non-conference call firms. These effects may be temporary, however, if non-conference call firms "catch up" by providing equivalent information after the 20-day window but before the next earnings announcement. To evaluate whether conference calls cause a longer-term difference in error and/or dispersion, we need to allow time for non-conference call firms to disclose information relevant to quarter t earnings. Thus, our second post-call measures (ERROR2 and DISP2) start at the same time but end later, upon the announcement of quarter t earnings.

[Insert Figure 1 about here]

For each of the three measurement dates depicted in Figure 1 (i.e., the pre-conference call and the two post-conference call dates), we use the most current outstanding forecast from each individual analyst – as long as it is within 90 days before the measurement date.[9] The 90-day requirement reduces the effects of potentially stale forecasts, and includes only analysts who actively follow a firm. We then match each analyst's pre- and post-conference call forecasts and retain only those forecasts made by analysts with forecasts at all three horizons.

Conference call data and sample selection

First Call, an information provider to institutional investors, maintains a data set of daily conference call schedules, which we use to identify firms hosting conference calls. Table 1 breaks down the number of conference calls on the First Call database by year. The first three columns present all observations listed on the First Call database (excluding duplicate observations, missing data, and clearly erroneous conference call dates).[10] The data indicate that firms' use of conference calls has grown steadily from 1995 (the database ends in April 1998, resulting in fewer observations in 1998). Approximately 3,800 firms have at least one conference call on the database.

[Insert Table 1 about here]

The next three columns of Table 1 list the number of conference calls hosted within a nine-day window (-3 to +5) surrounding the earnings announcement date (as listed on Zack's Investment Research's surprise file). Approximately 75 percent of all conference calls occur within this nine-

[9] The 90-day horizon means that some forecasts included in the first post-conference call measures were actually made *before* the conference calls. We include these forecasts because an analyst's failure to revise a forecast after an earnings announcement/conference call is indicative of the (lack of) information released. Our analysis does, however, control for the average age of the forecasts in the cross-sectional tests.

[10] To evaluate the completeness and accuracy of the First Call data, Tasker (1998) obtained independent verification of conference call firms by contacting sell-side analysts and asking them to identify firms that held quarterly conference calls from a sample of firms in the industry the analyst followed. Tasker finds the First Call data include 95 percent of the firms that host conference calls regularly. In addition, Frankel et al. (1999) select a sample of 188 firms listed on Compustat that the First Call database did not list as hosting conference calls. The authors contacted these firms individually and 92 percent confirm that they did not hold conference calls during 1995 (the year of their study). To the extent the inaccuracies in the First Call database result in misclassifications of conference call and non-conference call quarters, the power of our tests is reduced.

day window, suggesting that most conference calls take place in conjunction with earnings announcements. The last three columns present similar data for firm-quarters with forecast data available on Zack's individual analyst estimate history.

Table 2 summarizes our sample selection process. The initial sample consists of firm-quarters with earnings announcement dates for both quarter t and t-1 available on Zack's earnings surprise history files for the period January 1995 through March 1998 (corresponding to the period covered by the First Call database). We merged the initial sample with the First Call data to identify firm-quarters where conference calls occur within a nine-day window (-3 to +5) surrounding the prior quarter's earnings announcement (13,253 firm-quarters).[11] We call these "conference call quarters." We classify firm-quarters in the initial sample that are not identified as conference call quarters as non-conference call quarters and use them as a control group (64,389 firm-quarters). From this combined sample (77,642 firm-quarters), we eliminate (1) firm-quarters where managers are "late" in announcing earnings (more than 45 [90] days past the end of the quarter for fiscal quarters 1-3 [4]); (2) firm-quarters that do not have at least two analysts with forecasts at both the pre- and post-conference call date; (3) firm-quarters without price data on Compustat; and (4) the top and bottom 1 percent of the dependent variable observations.[12]

[Insert Table 2 about here]

Finally, three additional data selection criteria reduce the effects of potentially confounding factors:

1) We eliminate quarters where firms host conference calls between the fifth day after the quarter t-1 earnings announcement and the date of the quarter t earnings announcement.

[11] Use of a narrower window (0 to +2) does not affect our results. Our tabulated results are based on the nine-day (-3 to +5) window because firms may differ in their timing of conference calls relative to the earnings release.

[12] The number of observations listed represents all firm-quarters with at least one dependent variable. Less than 2% of observations are eliminated since we determined the top and bottom 1 percent for each dependent variable separately. Eliminating the top and bottom 1 percent significantly affects the parametric tests reported in the next section (results are generally insignificant if we include these extreme observations). However, as might be expected, the non-parametric univariate tests are unaffected by the inclusion of these observations.

2) For firms hosting at least one conference call, but that host conference calls in less than 50 percent of their firm-quarters after their first appearance on the First Call database ("sporadic conference call users"), we eliminate *all* firm-quarters from their first conference call onward, i.e., we include observations for these firms *only* before they begin their sporadic use of conference calls as non-conference call firm-quarters.[13]

3) For firms hosting conference calls in more than 50 percent of their firm-quarters after their first appearance on the First Call database (we call these "regular conference call users"), we eliminate all "non-conference call" quarters after the first conference call.

The first criterion eliminates firm-quarters with "special" conference calls not directly related to earnings announcements. Conference calls that are unrelated to earnings announcements are more likely to result from some underlying news event (e.g., announcement of a merger), which could influence the change in forecast error or dispersion. Similarly, the second criterion eliminates all quarters once a firm starts hosting conference calls on a sporadic basis. In these quarters, firms are more likely to host conference calls that discuss unusual events than recurring earnings announcements. By focusing only on conference calls regularly held in conjunction with earnings announcements, we reduce the possibility that the choice to host a conference call is endogenously determined.[14] Finally, since conference calls likely provide information useful for forecasting earnings beyond the next quarter, the third criterion eliminates subsequent non-conference call quarters for regular conference call users to avoid contamination from potential residual effects of previously-held conference calls.

Control Variables

Our tests of the relation between conference calls and (1) changes in analyst forecast error and (2) changes in forecast dispersion, control for firm size, earnings surprise, and forecast age, which

[13] We define regular (versus sporadic) users as firms that host conference calls in at least 50 percent of firm-quarters. We computed the percentage of quarters a firm hosts a conference call after the company's first appearance on the First Call database. Sixty-four percent of the firms with at least one conference call have a conference call percentage of greater than 50 percent. We test the sensitivity of our results to this sample selection criterion in Section IV.

[14] Results subsequently presented in Table 4 indicate that the pre-announcement levels of forecast error and dispersion are not higher in conference call quarters than in non-conference call quarters, suggesting that the decision to host conference calls is not endogenously driven by a manager's attempt to "guide" analysts' forecasts that are relatively inaccurate.

prior research has found to affect the *levels* of forecast error and dispersion (Lang and Lundholm 1996, Barron et al. 1998, Brown 2001). We define these variables as follows:

SIZE = log of the market value of the firm's equity at the beginning of quarter t.

$SURP_t$ = $|EPS_t - EPS_{t-4}|/P_{t-4}$, where EPS_t is the primary earnings per share (including extraordinary items) for quarter t and P_{t-4} is the ending price per share at quarter t-4.

ΔAGE1 = average age of forecasts of quarter t earnings 20 days after quarter t-1 earnings announcement (POST1) less the average age of forecasts of quarter t earnings at the beginning of the quarter (PRE). Both averages are based on the forecasts used to compute the dependent variables, ERROR1 and DISP1.

ΔAGE2 = average age of forecasts of quarter t at the earnings announcement date (POST2) less the average age of forecasts of quarter t earnings at the beginning of the quarter (PRE). Both averages are based on the forecasts used to compute the dependent variables, ERROR2 and DISP2.

SIZE proxies for the richness of the firm's information environment. Although a firm's information environment affects the *levels* of forecast error and dispersion, we do not expect it to affect the *changes* in forecast error and dispersion; however, we control for size as a precaution. Second, we use the change in quarterly earnings relative to the prior year to proxy for the difficulty in forecasting earnings. Following Lang and Lundholm, we label this variable as surprise (SURP). We control for earning surprise in both the quarter being forecasted and the prior quarter since analysts' ability to forecast quarter t's earnings likely depends on both the earnings surprise in the prior quarter (i.e., quarter t-1) and any information discussed during the conference call that suggests an upcoming earnings surprise. Third, since stale forecasts increase the levels of forecast error and forecast dispersion, we control for differences in the average age of the consensus forecasts (ΔAGE). Brown (2001) finds forecast age is the most important determinant of forecast accuracy.

Finally, we add a new control variable – the pre-conference call levels of forecast error and dispersion. We use changes rather than levels of forecast error and dispersion to mitigate the effect of cross-sectional differences in information environments; however, the richness of a firm's information environment likely impacts the *initial* level of forecast error or dispersion, which could

limit the potential for reductions in these measures. For example, firms with richer information environments likely have lower initial forecast errors and dispersion and, as a result, have less room for conference calls to further decrease error and dispersion. Thus, we include pre-conference call levels of forecast error and dispersion to control for any potential relation between the use of conference calls and the richness of a firm's information environment.[15]

Cross-Sectional Tests

The following four regressions form the basis of our cross-sectional tests:

$$ERROR1_i = \beta_0 + \beta_1 CC_i + \beta_2 SIZE_i + \beta_3 SURP_{it} + \beta_4 SURP_{it-1} + \beta_5 \Delta AGE1_i + \beta_6 FE_{pre} + \varepsilon_i \quad (1)$$

$$ERROR2_i = \beta_0 + \beta_1 CC_i + \beta_2 SIZE_i + \beta_3 SURP_{it} + \beta_4 SURP_{it-1} + \beta_5 \Delta AGE2_i + \beta_6 FE_{pre} + \varepsilon_i \quad (2)$$

$$DISP1_i = \gamma_0 + \gamma_1 CC_i + \gamma_2 SIZE_i + \gamma_3 SURP_{it} + \gamma_4 SURP_{it-1} + \gamma_5 \Delta AGE1_i + \gamma_6 DISP_{pre} + \mu_i \quad (3)$$

$$DISP2_i = \gamma_0 + \gamma_1 CC_i + \gamma_2 SIZE_i + \gamma_3 SURP_{it} + \gamma_4 SURP_{it-1} + \gamma_5 \Delta AGE2_i + \gamma_6 DISP_{pre} + \mu_i \quad (4)$$

CC is a dummy variable equal to 1 if the quarter is a conference call quarter and zero otherwise. A significantly negative coefficient on β_1 in equations (1) and (2) is consistent with conference calls reducing the *error* in analysts' earnings forecasts (Prediction [1]). A significantly negative coefficient on γ_1 in equations (3) and (4) is consistent with conference calls reducing the *dispersion* of analysts' earnings forecasts (Prediction [2]).

Several features of our research design address potential alternative explanations. First, the use of the changes in forecast error and changes in forecast dispersion as the dependent variables reduces the potential effects of differences in firms' information environments, to the extent these differences affect the pre- and post-conference call measures equally. Second, as discussed above, the inclusion of control variables also reduces the possibility that differences in information environments affect our results. Third, the inclusion of non-conference call quarters controls for overall decreases in forecast error and dispersion as the earnings announcement date approaches. The use of this non-conference call control group also helps control for any general increase in the

[15] The authors thank the referee for this suggestion.

amount of information disclosed in earnings announcements in recent years (Johnson et al. 2000). We also conduct a battery of sensitivity tests, which we report in Section IV.

Within-Firm, Across-Time Tests

We also perform within-firm, across-time comparisons of the four dependent measures for firms that begin using conference calls during our sample period. We compare the measures of error and dispersion during initial conference call quarters to the same non-conference call quarters one year earlier. If analysts immediately learn to use the information provided in conference calls, we would expect the greatest decline in their forecast errors and in the dispersion of their forecasts to occur in the first conference call quarter. For completeness, we also examine the differences in the second and third conference call quarters. Note that it is possible that information released in earlier conference calls affects the pre-conference call measure (e.g., so that error decreased), which would reduce the potential for improvement for these subsequent conference call quarters.

For each firm with data available for both quarters, we compute the difference in the change in forecast error (and dispersion) between the first conference call quarter (or the 2nd or the 3rd conference call quarter) and the quarter one year earlier. We then test whether these differences are less than zero, i.e, whether error decreased more in conference call quarters. More specifically, we compute the differences in the four dependent variables as

$$DERROR1_i = ERROR1_{it}^{CC} - ERROR1_{i,t-4}^{NCC} \quad (5)$$

$$DERROR2_i = ERROR2_{it}^{CC} - ERROR2_{i,t-4}^{NCC} \quad (6)$$

$$DDISP1_i = DISP1_{it}^{CC} - DISP1_{i,t-4}^{NCC} \quad (7)$$

$$DDISP2_i = DISP2_{it}^{CC} - DISP2_{i,t-4}^{NCC} \quad (8)$$

where i = firm, t = quarter, CC = conference call quarter, and NCC = non-conference call quarter.

The within-firm, across-time analysis controls for firm-specific factors that are constant through time (rather than using non-conference call quarters as a control group). To the extent that

firms do not change their other disclosure policies during that year, we expect ERROR1 (ERROR2) and DISP1 (DISP2) will be smaller (more negative) during the first conference call quarter relative to the same quarter of the prior year. Thus, we expect DERROR and DDISP will be negative, reflecting a greater decrease in forecast error and dispersion, respectively.

IV. EMPIRICAL RESULTS

Descriptive Statistics

Figure 2 plots the frequency of forecast revisions around earnings announcement dates for conference call versus non-conference call quarters. Figure 2 shows a higher concentration of forecast revisions in the three-day window that corresponds to the day of and the two days after the earnings announcement in quarters when firms hold conference calls (17.5 percent) relative to those when firms do not hold conference calls (14.3 percent). The percentage of forecast revisions occurring in this three-day window (relative to those occurring during the rest of the quarter) is significantly higher for conference call quarters than non-conference call quarters ($\chi^2(1) = 472.94$, $p = 0.001$).[16] These data suggest that analysts revise their one-quarter ahead forecasts closer to the earnings announcement date in quarters when firms host conference calls in conjunction with the earnings announcement, consistent with Frankel et al. (1999).

[Insert Figure 2 about here]

Table 3 provides descriptive statistics for the combined sample of conference call and non-conference call quarters. While the decreases in forecast error and dispersion appear small as a percent of share price, all are significantly different from zero. Further, as a percent of the pre-announcement-level of forecast error, the reductions in forecast error are approximately 12 percent and 26 percent for the first and second post conference call windows, respectively, suggesting that

[16] We find similar results for one-day, two-day, and five-day windows. Most of the difference shown in Figure 2 occurs on day +1 (11.2 percent for conference call quarters versus 8.9 percent for non-conference call quarters).

forecast error decreases are also economically significant. The firms in the final sample are quite large with a mean (median) market value of equity of $2,532 ($632) million, falling in the 90th (70th) percentile of all firm-quarters reported on the quarterly Compustat files for the period 1995-98. Market values are also highly skewed, so our empirical tests use the log of market values. The negative value for ΔAGE1 indicates that the average forecast is older in the pre-conference call measure than in the first post-conference call measure, while the positive value for ΔAGE2 indicates that the average forecast is more recent in the pre-conference call measure than the second post-conference call measure. This finding is consistent with a concentration of forecast revisions following the earnings announcement.[17]

[Insert Table 3 about here]

Table 4 provides the results of univariate tests comparing conference call quarters with non-conference call quarters. As predicted, both parametric t-tests and non-parametric Wilcoxon rank-sum tests indicate that the decreases in error and dispersion of analysts' forecasts immediately after the earnings announcement (ERROR1 and DISP1) are significantly greater in quarters in which firms host conference calls in conjunction with the earnings announcement than in non-conference call quarters. The greater decrease in dispersion persists through the next earnings announcement (DISP2). Although the decrease in forecast error measured through the next earnings announcement (ERROR2) is not significant at conventional levels using a one-tailed parametric t-test (p=0.13), the lack of significance is likely due to outliers, because the difference is highly significant using the non-parametric Wilcoxon rank-sum test (p=0.0001).[18]

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[17] The average age of forecasts used to compute ERROR1(2) and DISP1(2) are 41 (43) days for the pre-conference call measure and 32 (44) days for the post-conference call measure. Thus, forecasts used to compute the first post-conference call measure (i.e., for ERROR1 and DISP1) tend to be more recent, reflecting the tendency for analysts to revise forecasts following the earnings announcement.

[18] Large firms are more likely to use conference calls, i.e., the correlation between SIZE and CC is 0.21. Large firms also tend to have smaller changes in forecast error, i.e., the correlation between SIZE and ERROR1 and ERROR2 is -0.13

[Insert Table 4 about here]

Consistent with Tasker (1998) and Frankel et al. (1999), larger firms are more likely to host conference calls. The current and lagged earnings surprise variables ($SURP_t$ and $SURP_{t-1}$) are not significantly different between conference call and non-conference call quarters using a parametric t-test; however, the Wilcoxon rank-sum test suggests that lagged surprise is higher in conference call quarters than non-conference call quarters, consistent with firms using conference calls to explain significant changes in earnings. The change in the average age of the forecasts (ΔAGE1 and ΔAGE2) is significantly greater in conference call quarters than non-conference call quarters, consistent with analysts revising more frequently in conference call quarters. Finally, the pre-conference call levels of forecast error and dispersion are smaller in conference call quarters than non-conference call quarters. To the extent that smaller pre-levels of error and dispersion result in smaller *changes* in error and dispersion, not controlling for the initial levels of error and dispersion weakens our ability to detect differences in each dependent variable for conference call versus non-conference call firm-quarters.

Results of Cross-Sectional Tests

We present the results of the regressions to test Prediction (1), i.e., equations [1] and [2] in Table 5, Panel A. We eliminate outliers using the procedures discussed in Belsley et al. (1980).[19] As predicted, the coefficient on the conference call variable (CC) is significantly negative (p-values < 0.01) for both the shorter window (ERROR1) and the longer window (ERROR2). Thus, the decrease in forecast error directly after the earnings announcement is significantly greater in quarters in which firms hold conference calls in conjunction with the earnings announcement than in non-conference call

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and -0.14, respectively. This suggests that large conference call firms have less room for the conference call to further reduce error.

[19] Specifically, we eliminate observations with studentized residuals with absolute value greater than 2; or with a hat matrix value greater than 2•p/n (where p = number of parameters and n = number of observations); or a DFFITS statistic

quarters. These results further suggest that firms not hosting conference calls do not provide sufficient additional information later in the quarter to "catch up" with firms that host conference calls. Using the shorter window (ERROR1), the decrease in error appears to be about 0.013 percent (of price) greater in conference call quarters than non-conference call quarters. While it is difficult to assess the informational advantage that this result represents, a comparison of the difference to the empirical distribution of ERROR1 provides a sense of the economic significance of the difference. The interquartile range for ERROR1 (in the sample used for the regression analysis) is 0.062 percent. Thus, the difference is about 21 percent of the interquartile range. A similar assessment for the longer window indicates that the decrease in error for conference call firms is approximately 0.022 percent (of price) or 17 percent of the interquartile range. Overall, our results suggest that firms disclose more information during conference call quarters than in non-conference call quarters and that this information difference persists through the next quarter's earnings announcement.

[Insert Table 5 about here]

Table 5, Panel B reports the results of the regressions to test Prediction (2) (equations [3] and [4]). As predicted, the coefficient on the conference call variable is significantly negative (p-values < 0.01) for both the shorter window (DISP1) and the longer window (DISP2). These results are consistent with our prediction that the decrease in forecast dispersion in the period after the prior quarter's earnings announcement is significantly greater in quarters in which firms host conference calls in conjunction with the earnings announcement than in non-conference call quarters. For DISP1, the difference of 0.004 percent (of price) is approximately 11 percent of the interquartile range; for DISP2, the magnitude of the effect is approximately 0.007 percent of price and 13 percent of the interquartile range. Overall, our results suggest that dispersion in analysts' forecasts

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greater than $2\sqrt{p / n}$. The main results are similar without this procedure, i.e., the coefficient on the CC variable is significant at less than the 2 percent level for all dependent variables.

decreases more during conference call quarters than in non-conference quarters, and that this decrease persists through the next quarter's earnings announcement. [20]

Sensitivity Analyses for Cross-Sectional Regressions

In addition to the previously discussed features of our research design that reduce the possibility that our results primarily reflect differences across firms' information environments (e.g., our use of changes in forecast accuracy versus levels, and the incorporation of firm size and pre-announcement levels of forecast error and dispersion), we perform one final procedure. We add to the regression models a dummy variable (CCFIRM) that equals 1 for all firm-quarters (both conference call and non-conference call) for firms that were identified as regular conference call users:

$$ERROR1_i = \beta_0 + \beta_1 CC_i + \beta_2 CCFIRM_i + \beta_3 SIZE_i + \beta_4 SURP_{it} + \beta_5 SURP_{it-1} + \beta_6 \Delta AGE1_i + \beta_7 FE_{pre} + \varepsilon_i$$

The coefficient on CCFIRM is the change in error or dispersion in the non-conference call quarters of firms that eventually host at least one conference call, relative to the change in error for non-conference call quarters of firms that never host conference calls. More importantly, the interpretation of the coefficient on CC changes – it now represents the incremental effect on analysts' forecasts of hosting a conference call in a particular quarter for firms that regularly host conference calls. In this specification, the coefficient on CC is significant for all dependent variables at the 1 percent level or better. The coefficient on CCFIRM is generally not significant (except in the DISP2 regression), suggesting that non-conference call quarters for firms that eventually host conference calls are not significantly different from non-conference call quarters for firms that never host conference calls. This analysis suggests that firm-specific differences in

[20] Control variables were discussed in section III. While we have no prediction for the sign of the coefficients, all except SIZE in the ERROR1 regression and ΔAGE2 in the DISP2 regression were significant. In particular, FE_{pre} and $DISP_{pre}$ were highly significant in all regressions, consistent with the notion that larger pre-levels of forecast error and dispersion allow for a greater reduction in forecast error and dispersion during the quarter.

information environments between firms that regularly host conference calls and those that do not are not driving our main results.

We also perform a number of other sensitivity checks on the cross-sectional regressions. t-statistics based on White's consistent covariance matrix yield results that are virtually identical to those reported in the tables. We also repeat the regressions after separately including (1) calendar quarter dummy variables to control for potential time-period specific effects, (2) dummy variables to control for potential fiscal-quarters effects, (3) 2-digit SIC code dummy variables to control for potential industry effects, and (4) a time-trend variable to control for potential increases in disclosures in recent years. In all cases, the coefficient on the CC variables remains significant at better than the 5 percent level.

Next, we test the sensitivity of our results to our selection of conference call quarters. The last three sample selection procedures (summarized in Table 2) were designed to increase the power of our tests. If we eliminate these last three selection criteria, the coefficient on the CC variable remains significant at the 5 percent level for all dependent variables. In addition, if we redefine regular users of conference calls as those firms that host conference calls in at least 75 percent of the quarters (after their first conference call quarter), the coefficient on the CC variable again remains significant at the 5 percent level for all dependent variables.[21]

Finally, although changes in forecast error and dispersion are less likely to be correlated across time for a given firm than levels of forecast error and dispersion, we conduct two tests to address potential dependence in our pooled data. In the first test, we re-estimate our regressions after averaging each dependent and independent variable by firm, so there is only one observation per firm in this analysis. In the second test, we randomly select one observation per firm and re-run

[21] As another sensitivity check, we also eliminated all non-conference call observations for any firm that ever hosts a conference call, per the First Call database (i.e., both sporadic *and* regular conference call users). We find similar results.

the regressions on this subset of observations. In both tests, inferences are not changed, suggesting that multiple observations for the same firm are not significantly biasing our results.

Results of Within-Firm Tests

Table 6 presents the results of the within-firm tests. The first set of four columns presents statistics on the (univariate) differences in the four dependent (and control) variables between the first conference call quarter and the same quarter one year prior. We report the mean, median, and percent of observations less than zero. The reported p-values are one-sample t-tests and non-parametric Wilcoxon signed-rank tests, respectively. As predicted, the decrease in forecast error (DERROR1 and DERROR2) is greater in the first conference call quarter than in the same quarter one year prior (all p-values < 0.02). Of the firms with a non-zero difference between the first-conference call quarter and the same quarter one year prior, between 53 percent and 55 percent show a greater decrease in error during the conference call quarter.

[Insert Table 6 about here]

The next two sets of four columns present similar results for the second and third conference call periods compared to those for the same quarters one year prior. The results for these quarters are somewhat weaker – as might be expected if the first conference call decreased the forecast error in the pre-conference call period for the second and third conference call quarters. The means and medians are all negative (indicating a larger decrease in error during the conference call quarter compared to that from one year prior); however, the differences tend to become less significant with each quarter. Overall, the results reported here support the previous cross-sectional results and suggest that conference calls increase the information available to analysts that assists them in accurately forecasting a firm's earnings for the next quarter.

However, inconsistent with the results of our cross-sectional tests, the results of the within-firm tests for forecast dispersion do not support Prediction (2). The decrease in forecast dispersion

around the prior quarter's earnings announcement is not significantly greater during the first conference call quarter compared to that for the same quarter one year earlier. We also find no significant differences for the second and third conference call quarters. The insignificant results of the within-firm forecast dispersion tests may call into question our cross-sectional test results on dispersion. However, the smaller sample sizes in the within-firm tests reduce our ability to detect differences between conference call and non-conference call quarters, should they exist.

Sensitivity Analyses on Within-Firm Tests

A potential problem for the within-firm analysis is that we cannot ascertain whether a firm's first appearance on the database is truly the firm's first conference call. Firms whose first appearance in our sample coincides with the start of the database may have held conference calls in earlier quarters. As a result, the comparison quarter from the prior year, which we deem a non-conference call quarter, might in fact have been an unobserved conference call quarter, thereby weakening our tests. Since the potential for this problem is greatest for firms whose first conference call quarter is at the start of the database, we perform our within-firm tests separately for this group of firms (deemed the "early-adopters") and on the subset of firms whose first conference call quarter occurs after the start of the database (deemed the "late-adopters"). Our results (not reported in the tables) are strong for the early-adopters and weak for the late-adopters. The fact that the results are not weaker (and in fact are stronger) for the early adopters suggests that any potential misclassification caused by considering the first conference call quarter on the database as the first conference call the firm held does not materially affect our inferences.

Another potential problem for the within-firm research design is that any increase in the tendency to disclose forward-looking information in recent years could explain the difference in the changes in error and dispersion between the first conference call quarter and the same quarter one year prior. To address this possibility, we perform similar within-firm tests on a sample of non-

conference call firms matched to our conference call adopters on quarter, 2-digit SIC code, and market value. The results of these tests (not reported in tables) indicate that non-conference call firms do not experience similar decreases in error over the same time period (all p-values > 10 percent). This fact in turn suggests that a general increase in the tendency to disclose forward-looking information in recent years does not drive the results for our conference call adopters.

Finally, our within-firm design does not control for potential differences across *quarters*. Of the control variables included in our cross-sectional tests, only the SURP variables attempt to control for quarter-specific factors that could affect our results. The remaining control variables address cross-sectional differences that should be controlled for by our within-firm design. Thus, we run regressions on our within-firm sample with DERROR and DDISP on the left-hand side and $DSURP_t$ and $DSURP_{t-1}$ on the right-hand side. The intercepts from these regressions represent the mean value of DERROR and DDISP after controlling for earnings surprises in the current and prior quarters. Similar to results from the univariate tests reported in Table 6, the intercept in the DERROR regression is significant, consistent with conference calls reducing the error in analysts' forecasts. Also consistent with the univariate results, the intercept in the DDISP regression was not significant.

V. DO CONFERENCE CALLS BENEFIT ALL ANALYSTS EQUALLY?

Both our cross-sectional tests and our within-firm tests support the conclusion that conference calls provide information useful to analysts in predicting future earnings. However, it is possible that the information managers provide during conference calls does not benefit all analysts equally. In other words, a subset of analysts may be driving the decrease in error. We investigate this issue by comparing the changes in individual analysts' forecasts error across different types of analysts.

First, we partition analysts into two groups based on forecasting ability. Stickel (1992) and Sinha et al. (1997) find a positive relation between past forecast accuracy and current forecast accuracy. Brown (2001) finds that a simple model including only past forecast accuracy explains current forecast accuracy as well as a relatively complex model incorporating economic determinants of forecast accuracy identified in prior literature. Thus, we use a relative ranking of analysts' prior forecast accuracy as a proxy for ability. We begin by computing mean-adjusted forecast errors by deducting the average forecast error for the firm quarter from each individual analyst's forecast error. We then compute the average mean-adjusted forecast error for each analyst over the prior two years, and rank the analysts based on this average. We compute percentage rank as the rank value divided by the number of analysts ranked.[22] We consider analysts with rankings greater than 0.5 to be "high-ability" analysts and analysts with rankings less than or equal to 0.5 to be "low-ability" analysts. For each firm-quarter, we compute the average ERROR1 and ERROR2 variable for the high ($ERROR1^{HI}$ and $ERROR2^{HI}$) and low ($ERROR1^{LO}$ and $ERROR2^{LO}$) ability groups. We also compute the difference between the two groups ($ERROR1^{HI\_LO}$ and $ERROR2^{HI\_LO}$) for firms with at least one analyst in each group. If conference calls level the playing field across analysts, the improvement in accuracy for the low-ability group will exceed the improvement for the high-ability group, and $ERROR1(2)^{HI\_LO}$ will be larger (less negative) in conference call quarters. On the other hand, if the high-ability group makes better use of the information provided in the conference call, $ERROR1(2)^{HI\_LO}$ will be smaller (more negative) in conference call quarters. Given the two opposing predictions, we conduct two-tailed tests.

[22] These rankings are based on all analysts contributing forecasts for a given firm on Zack's individual estimate history, whereas the analyst forecasts that comprise our computation of ERROR1(2) must meet other data requirements (e.g., must have forecasts in both the pre- and post-conference call periods). Thus, the partitioning variable will not necessarily result in an even split of the forecasts comprising ERROR1(2) and we will lose some firm-quarter observations if we can consider no analysts to be high or low within that firm-quarter.

Table 7, Panel A presents univariate comparisons of the decrease in forecast error between conference call quarters and non-conference call quarters. The results are analogous to those in Table 4 on ERROR1 and ERROR2 – only in this table we have decomposed the ERROR1 and ERROR2 variables into two groups based on analyst ability. Conference calls appear to have a short-term benefit for both high- and low-ability analysts, i.e., $ERROR1^{HI}$ and $ERROR1^{LO}$ are both smaller (more negative) in conference call quarters than non-conference call quarters (p-values < 0.05). However, the difference between the high- and low-ability groups ($ERROR1^{HI\_LO}$) is larger (less negative) in conference call quarters than non-conference call quarters (p-values < 0.05 for both t-test and non-parametric Wilcoxon rank-sum test), consistent with conference calls providing greater benefit to low-ability analysts. For the longer window, the difference between conference call quarters and non-conference call quarters is not significant for the high-ability group ($ERROR2^{HI}$) using a t-test (p=0.379), but is significant using the Wilcoxon test (z=4.30; p=0.0001). The effect of conference calls for the low ability group ($ERROR2^{LO}$), however, is stronger (t-stat=2.32, p=0.021; Wilcoxon z-score=5.40, p=0.0001). Once again, the difference between the high and low groups ($ERROR2^{HI\_LO}$) is larger in conference call quarters than non-conference call quarters (p-values < 0.05 for both t-test and Wilcoxon rank-sum test). In summary, while both high and low ability analysts benefit from conference calls, low ability analysts appear to benefit more.

[Insert Table 7 about here]

Table 8, Panel A presents the results of cross-sectional regressions of the difference variable, $ERROR1(2)^{HI\_LO}$, on a conference call dummy variable and on the control variables used in the previous regressions. If conference calls benefit the low-ability group more than the high-ability group, $ERROR1(2)^{HI\_LO}$ should be larger in conference call quarters and the coefficient on CC should be positive. For these regressions, we computed the $\Delta AGE1(2)$ variable and the FE_{PRE} variable at the individual-analyst level and aggregate them between the high- and low-ability groups.

Similar to the dependent variable, the regression includes the difference in these variables between the high and low ability groups. The coefficient on CC is significantly positive for both the shorter window ($ERROR1^{HI\_LO}$, p = 0.014, two-tailed) and the longer window ($ERROR2^{HI\_LO}$, p = 0.031, two-tailed). Similar to our univariate results, these findings suggest that low-ability analysts benefit more (in terms of improvement in forecast error) from conference calls than do high-ability analysts.

[Insert Table 8 about here]

We also perform similar analyses partitioning analysts based on their brokerage-firm affiliations. Using *Institutional Investor*'s ranking of research teams from various brokerage firms, we identify analysts associated with firms that are listed in the top 20 at least once during the period 1995-98.[23] We consider analysts from these firms to be of higher quality and/or to have greater access to managers. Table 7, Panel B presents the results of differences between high- and low-quality analysts. Similar to the results presented in Panel A, conference calls appear to benefit both high- and low-quality analysts – particularly in the shorter window. However, while the effect of conference calls appears to be stronger for the low-quality analysts, the difference between the high- and low-quality groups is not statistically different between conference call and non-conference call quarters using means (p-values > 0.10) and only marginally significant based on the Wilcoxon test (p=0.07 for $ERROR1^{HI\_LO}$ and p=0.10 for $ERROR2^{HI\_LO}$). Parallel to the analysis based on analyst ability, Panel B of Table 8 presents the results of cross-sectional regressions of the difference variable, $ERROR1(2)^{HI\_LO}$, on a conference call dummy variable and control variables. The coefficient on the CC variable is not significant at conventional levels for the shorter window and

[23] Firms listed in the top 20 at least once during the 1995-98 period include: Merrill Lynch; Morgan Stanley Dean Witter; Goldman Sachs; Donaldson, Lufkin, and Jenrette; Saloman Smith Barney; Paine Webber; CS First Boston; Bear Stearns; Prudential Securities; Sanford C. Bernstein; Lehman Brothers; Schroder & Co.; Cowen & Co.; JP Morgan; BT Alex Brown; Deutsche Bank Securities; CIBC Oppenheimer; Nations Bank Montgomery Securities; Warburg Dillon Reed; NatWest Securities; and Gerard Klauer Mattison.

approaches significance in the longer windows ($p = 0.104$).[24] Overall, the results on analyst type based on brokerage firm affiliation provide at best weak evidence that conference calls provide greater benefits to lower ranked analysts. [25]

VI. SUMMARY AND CONCLUSIONS

Substantial growth in the use of conference calls in recent years, combined with the SEC's concern about the potential for selective disclosure in conference calls, motivated us to examine the change in the error and dispersion of analysts' forecasts following earnings-related conference calls.

Our evidence suggests that the regular use of earnings-related conference calls increases the amount of public information available to analysts, improving their ability to accurately forecast earnings for the next quarter. In cross-sectional tests, we find that the decrease in analysts' forecast errors directly after the prior quarter's earnings announcement is greater when firms host conference calls than when they do not. This greater decrease in forecast error persists until the subsequent earnings announcement. We also conduct within-firm tests, comparing the change in forecast error for the same firm before and after the firm starts hosting conference calls, and again find a greater decrease in forecast error when the firm first hosts conference calls. Our results suggest that managers disclose more information during conference call quarters than during non-conference call quarters, and that this information difference persists through the next quarter's earnings announcement.

We also find some evidence that conference calls tend to reduce the dispersion in analysts' forecasts, although these results are less conclusive. In our cross-sectional tests, we find that the decrease in the dispersion of analysts' forecasts directly after the prior quarter's earnings

[24] We performed these tests using a within-firm design (similar to the tests presented in Table 6); however the sample sizes are small (less than 200 for the difference variable $ERROR1(2)^{HI\_LO}$). The results do not indicate that the high- and low-ability (quality) groups are significantly different before and after the initial conference call.

announcement is relatively greater in quarters when firms hold conference calls than in quarters when they do not. However, our within-firm comparisons do not provide similar support. The dispersion in analysts' forecasts does not decrease significantly after the firm begins to host conference calls (but our within-firm tests are necessarily based on much smaller samples, reducing the power of our tests to detect differences).

Overall, our results suggest that conference calls could present a selective disclosure problem if the public is not privy to these calls. During our sample period (prior to the passage of Reg FD), relatively few firms allowed individuals to participate in these calls – a 1998 survey by NIRI indicated only 29 percent of firms surveyed invited individuals to participate in their conference calls and that only 14 percent invited the media (NIRI 1998c). While the passage of Reg FD has likely increased the proportion of firms that allow open access to their calls, there is still considerable controversy over the effect of Reg FD on the information flow to the market (see for example, Opdyke and Schroeder 2001). Given the public had at best restricted access to conference calls during our sample period, our evidence is consistent with these calls increasing the information provided to financial analysts. Our evidence further suggests that an information gap existed between the analyst community and the remainder of the investment community, which is consistent with the SEC's concerns.

We also consider whether conference calls "level the playing field" across analysts by examining whether conference calls provide more benefits to analysts with relatively weaker forecasting ability and/or to those with less access to management. Using prior forecast accuracy as a proxy for analysts' forecasting ability, our results indicate that both low and high ability analysts benefit from conference calls. However, analysts with weaker prior forecasting ability benefit more from these calls, suggesting that conference calls do act to level the playing field between these two

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[25] Except for SIZE, all of the control variables in Table 8 were significant.

groups. Our results on the differential effects of conference calls on the forecasts of analysts with less access to management are inconclusive.

Our study is subject to several limitations. First, our sample only examines conference calls held regularly in conjunction with quarterly earnings announcements. Second, the sample consists of relatively large firms. Thus, the results may not generalize to other types of conference calls or to the broader population of firms. Third, we cannot determine which of our sample conference calls were restricted from public access, although given the time period covered in the sample, most calls were likely restricted. Finally, we cannot rule out the possibility that these firms disclose the same information introduced during the analyst conference call simultaneously to the entire investment community, although it seems unlikely that a press release could fully capture the richness of a conference call.

Appendix

Implications of BKLS Framework for Forecast Error and Dispersion

In BKLS (1998), analysts use both public and private information in forecasting firms' earnings. They denote the precision of public information as *h* and the precision of private information as *s*. Their framework focuses on two empirically observable properties of analysts' forecasts – forecast dispersion (*D*) and the squared error in the mean forecast (*SE)*. In the simple case where the precision of private information is the same across analysts ($s_i = s$ for all *i*), forecast dispersion and squared error are expressed in terms of *h* and *s* as follows:

$$D = \frac{s}{(h+s)^2} \qquad SE = \frac{h + s/N}{(h+s)^2}$$

Thus, one can express the effect of the precision of public information (*h*) on dispersion (*D*) and squared error (*SE*) of analysts' forecasts as follows:

$$\frac{\partial D}{\partial h} = \frac{-2s}{(h+s)^3} < 0 \qquad \frac{\partial SE}{\partial h} = \frac{s - (2s/N) - h}{(h+s)^3} < 0 \qquad if\ h > s\left(\frac{N-2}{N}\right)$$

The above analysis implies that the relation between forecast dispersion and the precision of public information is negative, i.e., that forecast dispersion decreases as *h* increases. The relation between squared error and the precision of public information is not as simple. The relation is negative (i.e., that forecast error decreases as *h* increases) if public information is at least as precise as private information (or if h is at least greater than $s \bullet [N-2]/N$). Intuitively, increased precision in public information increases the extent to which analysts rely on public information relative to private information. Because private information is (by definition) idiosyncratic, the error in private signals tends to cancel out when averaging across a number of analysts (i.e., there is a "diversification effect"). Thus, if public information is imprecise relative to private information, the benefit of increased precision in the public signal is offset by a loss in the benefits received from

diversification because analysts rely less on their private signals, and the net effect is an increase in forecast error. However, when the precision of public information is high relative to the precision of private information, the loss of benefit from diversification is small and the increased precision in the public information should reduce the error in analysts' forecasts.

We expect the effect of increased precision of public information to outweigh the effect of reduced diversification because we argue that public information is on average more precise than private information (i.e., that $h > s$). Public information provided by the firm such as annual reports, quarterly filings, and earnings announcements, are important sources of information. In addition, given that in the BKLS framework private information is uncorrelated across analysts, the BKLS framework would consider as public any common information managers provide to analysts in private conversations (and it is unlikely that the information managers provide would be completely "uncorrelated" across analysts). As such, much of the information conveyed in private conversations between managers and analysts is most likely "public" information in the BKLS framework.

Our analysis holds the precision of private information, s, constant. The effect of conference calls on private information is ambiguous. Conference calls may increase the precision of private information if analysts process the information management releases during a conference call into new private information (e.g. Kim and Verrechia, 1994). Alternatively, conference calls could reduce the precision of private information if they reduce analysts' incentives to gather private information (because public information mitigates the gains from private information). Thus, we hypothesize an effect only for public information, and base our predictions on the assumption that any changes in private information are immaterial second-order effects.

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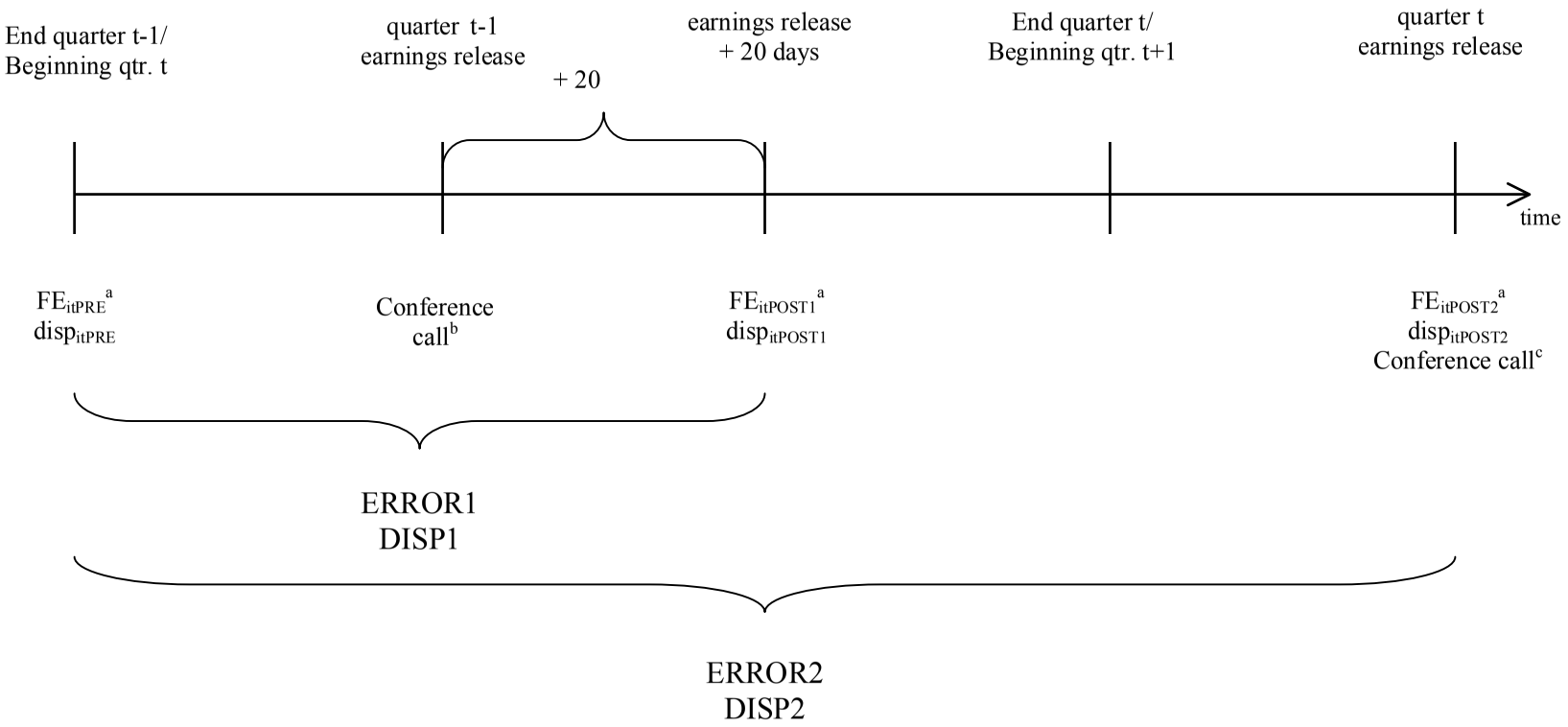
Figure 1: Timeline of Events and Measurement of the Dependent Variables



ERROR1	=	$(FE_{itPOST1} - FE_{itPRE})/P_{it-1}$	forecast error at 20 days after the quarter t-1 earnings announcement less forecast error at the beginning of quarter t, deflated by price at the beginning of quarter t
ERROR2	=	$(FE_{itPOST2} - FE_{itPRE})/P_{it-1}$	forecast error at the quarter t earnings announcement date less forecast error at the beginning of quarter t, deflated by price at the beginning of quarter t
DISP1	=	$(disp_{itPOST1} - disp_{itPRE})/P_{it-1}$	dispersion in forecast error 20-days after the quarter t-1 earnings announcement less dispersioin at the beginning of quarter t, deflated by price at the beginning of quarter t
DISP2	=	$(disp_{itPOST2} - disp_{itPRE})/P_{it-1}$	dispersion in forecast error at the quarter t earnings announcement date less dispersion at the beginning of quarter t, deflated by price at the beginning of quarter t

Figure 1: Timeline of Events and Measurement of the Dependent Variables (continued)

Where:

[a] $FE_{ith} = |F_{ith} - E_{it}|$, the absolute value of the consensus analyst forecast error for firm i for quarter t at horizon h (i.e., PRE, POST1, POST2). F_{ith} is the mean consensus analyst forecast for firm i for quarter t at horizon h as calculated using Zack's individual analyst estimate history. E_{it} is the actual earnings for quarter t as reported on Zack's earnings surprise file.

$disp_{ithPRE}$ = standard deviation of analysts' forecasts of firm i's earnings for quarter t at horizon h (i.e., PRE, POST1, POST2).

Thus,

FE_{itPRE} = consensus forecast error for firm i for quarter t earnings as of the beginning of the quarter.
$disp_{itPRE}$ = standard deviation of analysts' forecasts of firm i's earnings for quarter t as of the beginning of the quarter.

$FE_{itPOST1}$ = consensus forecast error for firm i as of 20 days after quarter t-1's earnings announcement.
$disp_{itPOST1}$ = standard deviation of analysts' forecasts of firm i's earnings as of 20 days after quarter t-1's earnings announcement.

$FE_{itPOST2}$ = consensus forecast error for firm i for quarter t earnings at the quarter t earnings announcement.
$disp_{itPOST2}$ = standard deviation of analysts' forecasts of firm i's earnings for quarter t as of quarter t's earnings announcement.

[b] Management discusses quarter t-1's earnings release and answers analysts' questions.

[c] Management discusses quarter t's earnings release and answers analysts' questions.

Figure 2: Forecast revisions -- conference call vs. non-conference call quarters

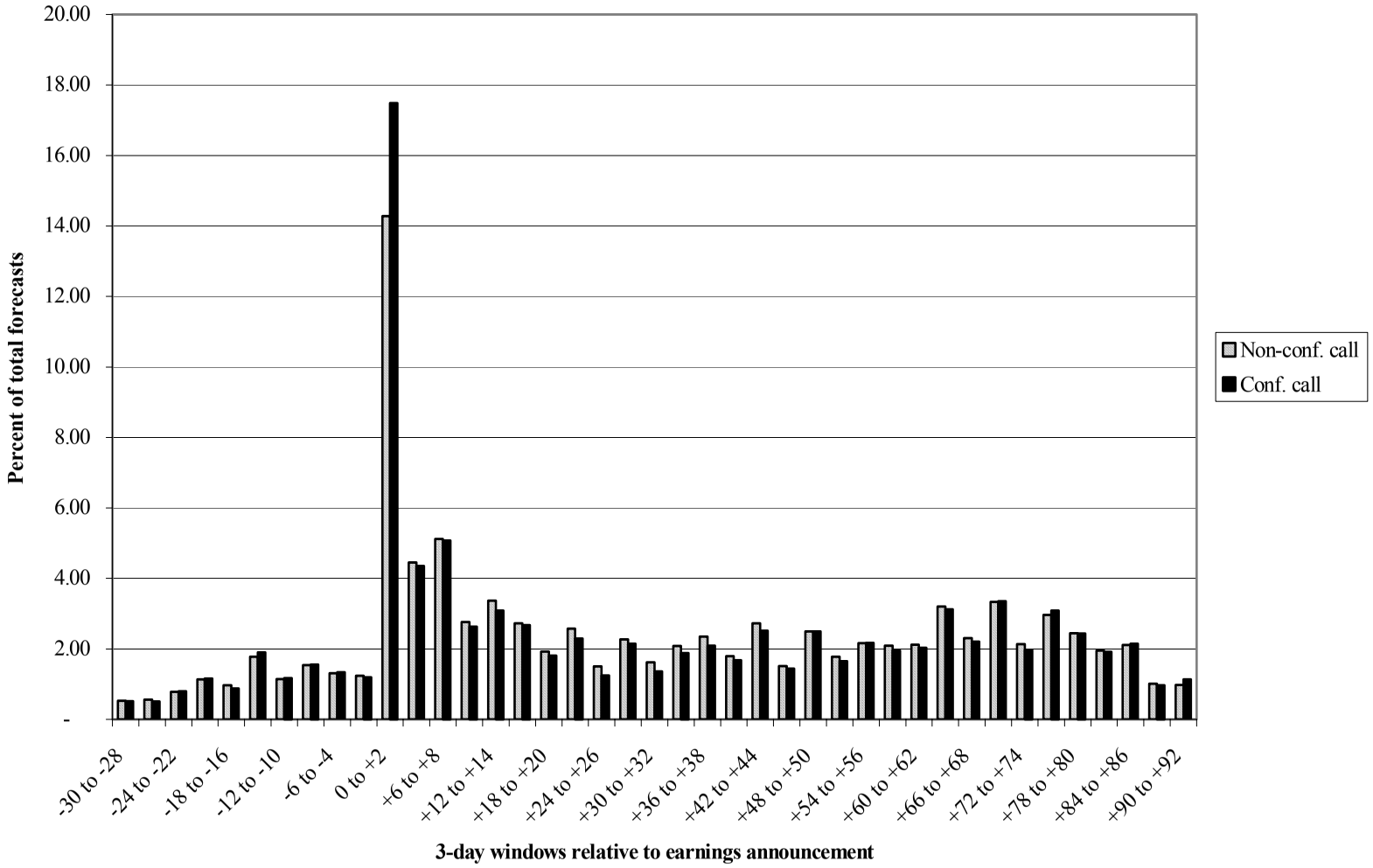


TABLE 1
Descriptive Data on Conference Calls

	Total conference calls on First Call database[1]			Conference calls near earnings announcement date[2]			Conference calls with forecast data available on Zack's individual tape[3]		
Year	**Calls**	**Firms**	**Calls/Firm**	**Calls**	**Firms**	**Calls/Firm**	**Calls**	**Firms**	**Calls/Firm**
1995	3,020	1,488	2.03	2,125	1,209	1.76	1,513	872	1.74
1996	6,011	2,482	2.42	4,456	2,149	2.07	3,120	1,535	2.03
1997	8,008	3,110	2.57	5,873	2,725	2.16	4,283	2,131	2.01
1998	2,507	1,742	1.44	1,861	1,493	1.25	819	803	1.02
Total	19,546	8,822	2.22	14,315	7,576	1.89	9,735	5,341	1.82
Total unique sample firms		3,836			3,366			2,607	

[1]The complete data set from First Call Corporation included 20,533 conference calls. 619 are duplicates (same firm and date of conference call); 20 observations listed dates for the conference call beyond 1998; and 348 observations had missing data (for either firm identification or date of conference call).

[2] We classify conference calls as near an earnings announcement if the date of the conference call falls between 3 days prior to and 5 days after the earnings announcement date listed on Zack's surprise file. We count multiple conference calls held within this nine-day window only once (eliminating 638 conference calls).

[3] Conference calls with at least one forecast made within the last 90 days from two dates corresponding to the pre-conference call and post-conference call date. See Table 2 for further sample selection criteria and Figure 1 for further description of pre- and post-conference call dates.

TABLE 2
Sample Selection Criteria

	Total	Conference Call Quarters[1]	Non-Conference Call Quarters
Quarters with earnings announcement dates for quarter t-1 available on Zack's surprise file (1995-1998)	90,173	14,315	75,858
No earnings announcement date for quarter t available on Zack's surprise file	(12,531)	(1,062)	(11,469)
Quarters with earnings announcement dates available on Zack's surprise file (1995-1998)	77,642	13,253	64,389
Earnings announcements not within 45 (90) days of quarter end for fiscal quarters 1-3 (4)	(14,790)	(1,216)	(13,574)
	62,852	12,037	50,815
No forecast revisions available on Zack's individual detail tape within 90 days of the PRE, POST1, and POST2 horizon dates (see Figure 1)	(30,231)	(2,302)	(27,929)
	32,621	9,735 [2]	22,886
Price data not available on quarterly Compustat	(690)	(88)	(602)
	31,931	9,647	22,284
Delete top and bottom 1% of dependent variable observations	(343)	(78)	(265)
	31,588	9,569	22,019
Delete firm-quarters with only 1 forecast	(11,493)	(2,213)	(9,280)
	20,095	7,356	12,739
Delete quarters with conference calls outside earnings announcement window	(1,763)	(941)	(822)
	18,332	6,415	11,917
Delete all quarters once conference calls begin for firms hosting at least one conference call but in 50% or less of firm quarters	(4,338)	(1,690)	(2,648)
	13,994	4,725	9,269
Delete non-conference call quarters once conference calls begin for firms with conference calls in greater than 50% of firm-quarters	(1,439)	---	(1,439)
Final sample	12,555	4,725	7,830

[1] Quarters are classified as conference call quarters if the firm hosts a conference call within a nine-day window (-3 to +5) surrounding the prior quarter's earnings announcement.
[2] Corresponds with the total conference calls with forecast data available from Zack's in Table 1.

TABLE 3
Descriptive Statistics for Dependent, Independent and Control Variables

	n	Mean	Standard Deviation	Median	Minimum	Quartile1	Quartile3	Maximum
Dependent variables								
ERROR1	12,032	-0.00083	0.00235	-0.00011	-0.02128	-0.00075	-0.00000	0.00419
ERROR2	10,286	-0.00181	0.00419	-0.00040	-0.03552	-0.00170	-0.00000	0.00500
DISP1	11,909	-0.00006	0.00121	-0.00000	-0.00690	-0.00030	0.00015	0.00681
DISP2	10,178	-0.00031	0.00144	-0.00006	-0.00897	-0.00060	0.00011	0.00615
Independent and control variables								
CC	12,555	0.3763	0.4845	0	1	1	0	0
SIZE	12,262	2,532.3	7,443.1	632.4	168,648.6	1,968.7	217.9	7.8
$SURP_t$	11,806	0.0132	0.0374	0.0047	2.2627	0.0114	0.0023	0.0000
$SURP_{t-1}$	11,551	0.0133	0.0486	0.0048	3.1936	0.0113	0.0023	0.0000
ΔAGE1	12,528	-9.1183	25.3660	-9.7	-80.0	-27.5	7.0	72.0
ΔAGE2	12,202	1.2204	25.2669	1.7	-82.0	-14.5	18.0	90.0
FE_{PRE}	12,032	0.00447	0.00901	0.00166	0.18286	0.00443	0.00068	0.00000
$DISP_{PRE}$	11,909	0.00137	0.00229	0.00069	0.05577	0.00154	0.00031	0.00000

Variable definitions:

ERROR1 = $(FE_{itPOST1} - FE_{itPRE})/p_{it-1}$
ERROR2 = $(FE_{itPOST2} - FE_{itPRE})/p_{it-1}$
DISP1 = $(DISP_{itPOST1} - DISP_{itPRE})/p_{it-1}$
DISP2 = $(DISP_{itPOST2} - DISP_{itPRE})/p_{it-1}$
} See Figure 1 for definitions of FE_{itPRE}, $FEit_{POST1}$, $FEit_{POST2}$, $DISP_{itPRE}$, $DISP_{itPOST1}$, and $DISP_{itPOST2}$

CC = 1 if the firm hosts a conference call at quarter t-1 earnings announcement, 0 otherwise

SIZE = log of market value of equity at the beginning of quarter t. For descriptive purposes, this table presents the actual market value (rather than the log values), but all subsequent tables use the log value.

$SURP_t$ = $|EPS_t - EPS_{t-4}|/p_{t-4}$, where EPS = earnings per share including extraordinary items, p_{t-4} = ending price at quarter t-4.

ΔAGE1 average age of forecasts of quarter t earnings 20 days after quarter t-1 earnings announcement (POST1) less the average age of forecasts of quarter t earnings at the beginning of the quarter (PRE). Both averages are based on the forecasts used to compute the dependent variables.

ΔAGE2 average age of forecasts of quarter t at earnings announcement date (POST2) less the average age of forecasts of quarter t earnings at the beginning of the quarter (PRE). Both averages are based on the forecasts used to compute the dependent variables, ERROR2 and DISP2.

TABLE 4
Univariate Tests Comparing Conference Call Quarters with Non-conference Call Quarters

	Conference Call Quarters			Non-conference Call Quarters			Prediction	Test of Mean Differences[1]		Non-parametric Wilcoxon rank-sum test[2]	
	n	Mean	Median	n	Mean	Median		t-value	p-value	z-score	p-value
Dependent Variables[3]											
ERROR1	4,583	-0.00094	-0.00016	7,449	-0.00077	-0.00006	CC<NCC	3.8445	0.0001	6.4608	0.0001
ERROR2	4,046	-0.00186	-0.00044	6,240	-0.00177	-0.00037	CC<NCC	1.1448	0.1262	3.9841	0.0001
DISP1	4,530	-0.00010	0.00000	7,379	-0.00003	0.00000	CC<NCC	3.1177	0.0009	4.5930	0.0001
DISP2	4,003	-0.00035	-0.00012	6,175	-0.00028	0.00000	CC<NCC	2.4383	0.0074	4.5842	0.0001
Control Variables[3]											
SIZE	4,698	6.9354	6.8672	7,564	6.2727	6.1868	?	23.4074	0.0001	22.8535	0.0001
$SURP_t$	4,564	0.0138	0.0048	7,242	0.0129	0.0046	?	1.1211	0.2623	1.1640	0.2444
$SURP_{t-1}$	4,478	0.0133	0.0050	7,073	0.0134	0.0047	?	0.1549	0.8769	2.1366	0.0326
ΔAGE1	4,716	-12.0282	-13.3167	7,812	-7.3616	-7.6667	?	10.2838	0.0001	10.1783	0.0001
ΔAGE2	4,632	0.4265	0.5000	7,570	1.7062	2.6667	?	2.7429	0.0031	3.7264	0.0001
FE_{PRE}	4,583	0.00399	0.00150	7,449	0.00477	0.00177	?	4.8979	0.0001	5.3864	0.0001
$DISP_{PRE}$	4,530	0.00130	0.00068	7,379	0.00141	0.00069	?	2.7809	0.0054	1.5071	0.1318

[1] Two-sample t-test (with adjustment for unequal variances where appropriate). p-values reported are one-tailed for dependent variables and two-tailed for control variables.
[2] p-values reported are one-tailed for dependent variables and two-tailed for control variables.
[3] See table 3 for variable definitions.

TABLE 5
Cross-sectional Regressions: Are Conference Calls associated with Changes in Forecast Error and Changes in Dispersion?

Panel A: Changes in forecast error

P1: The decrease in forecast error will be greater in conference call quarters than in non-conference call quarters ($\beta_1 < 0$).

Model: $$ERROR1(2)_i = \beta_0 + \beta_1 CC_i + \beta_2 SIZE_i + \beta_3 SURP_{it} + \beta_4 SURP_{it-1} + \beta_5 \Delta AGE1(2)_i + \beta_6 FE_{pre} + \varepsilon_i$$

	ERROR1		ERROR2	
Variable[1]	**Coefficient**	**p-value[2]**	**Coefficient**	**p-value[2]**
Intercept	0.0000770	0.0946	0.0006930	0.0001
CC	-0.0001330	0.0001	-0.0002270	0.0001
SIZE	0.0000078	0.2288	-0.0000426	0.0001
$SURP_t$	-0.0017750	0.0095	0.0024710	0.0103
$SURP_{t-1}$	-0.0029040	0.0001	0.0016270	0.0529
ΔAGE1(2)	0.0000058	0.0001	0.0000051	0.0001
FE_{PRE}	-0.1483930	0.0001	-0.5496530	0.0001
	Adjusted R^2 = 0.3126		Adjusted R^2 = 0.7070	
	N = 10,079 firm-quarters		N = 8,642 firm-quarters	

Panel B: Changes in forecast dispersion

P2: The decrease in forecast dispersion will be greater in conference call quarters than in non-conference call quarters ($\beta_1 < 0$)

Model: $$DISP1(2)_i = \gamma_0 + \gamma_1 CC_i + \gamma_2 SIZE_i + \gamma_3 SURP_{it} + \gamma_4 SURP_{it-1} + \gamma_5 \Delta AGE1(2)_i + \gamma_6 DISP_{pre} + \mu_i$$

	DISP1		DISP2	
Variable[1]	**Coefficient**	**p-value[2]**	**Coefficient**	**p-value[2]**
Intercept	0.0002420	0.0001	0.0004460	0.0001
CC	-0.0000394	0.0022	-0.0000782	0.0001
SIZE	-0.0000094	0.0241	-0.0000217	0.0001
$SURP_t$	0.0024040	0.0001	0.0031020	0.0001
$SURP_{t-1}$	0.0017990	0.0001	0.0016530	0.0002
ΔAGE1(2)	0.0000019	0.0001	0.0000002	0.5788
$DISP_{PRE}$	-0.2474290	0.0001	-0.5844560	0.0001
	Adjusted R^2 = 0.1825		Adjusted R^2 = 0.5218	
	N = 9,813 firm-quarters		N = 8,524 firm-quarters	

[1] See table 3 for variable definitions.
[2] The p-values reported are two-tailed except for the CC variable, which is one-tailed.

TABLE 6
Within-firm analyses: Are Conference Calls associated with Changes in Forecast Error and Changes in Dispersion?

	Difference between first conference call quarter and same quarter one-year prior				Difference between second conference call quarter and same quarter one-year prior				Difference between third conference call quarter and same quarter one-year prior			
	N	**Mean[1]**	**Median[2]**	**% < 0[3]**	**N**	**Mean[1]**	**Median[2]**	**% < 0[3]**	**N**	**Mean[1]**	**Median[2]**	**% < 0[3]**
Dependent variables[4]												
DERROR1	370	-0.00041	0.00000	53.43%	446	-0.00028	-0.00003	55.61%	286	-0.00025	0.00000	50.75%
		p=0.0008	p=0.0075			p=0.0138	p=0.0366			p=0.0673	p=0.1722	
DERROR2	326	-0.00054	-0.00008	54.72%	394	-0.00059	-0.00001	51.67%	255	-0.00069	-0.00003	51.60%
		p=0.0075	p=0.0139			p=0.0051	p=0.2815			p=0.0145	p=0.1191	
DDISP1	364	-0.00002	0.00000	48.55%	440	-0.00001	0.00000	52.07%	276	-0.00008	0.00000	51.72%
		p=0.4162	p=0.7148			p=0.4383	p=0.2714			p=0.2307	p=0.1815	
DDISP2	319	0.00007	0.00001	47.74%	388	-0.00002	-0.00002	53.05%	251	-0.00017	-0.00005	53.41%
		p=0.7462	0.8104			p=0.4224	p=0.2182			p=0.0782	p=0.0891	

[1] p-values reported are from one-sample t-tests of the means and are one-tailed for the dependent variables and two-tailed for the control variables.
[2] p-values reported are from a Wilcoxon sign-rank test and are one-tailed for the dependent variables and two-tailed for the control variables.
[3] Represents the proportion of negative values.
[4] The dependent variables are the difference between each variable (ERROR1, ERROR2, DISP1, DISP2) measured during the first, second or third conference call quarter and the same quarter one-year prior. See Table 3 for definitions of ERROR1, ERROR2, DISP1, and DISP2.

TABLE 7
Do Conference Calls Benefit All Analysts Equally?
Univariate Tests of Forecast Error by Analyst Type in Conference Call vs. Non-Conference Call Quarters

	Conference Call Quarters			Non-conference Call Quarters			Test of Mean Differences[1]		Non-parametric Wilcoxon rank-sum test[2]	
	n	Mean	Median	n	Mean	Median	t-value	p-value	z-score	p-value
Panel A: Partition based on analysts' prior forecast error:[3]										
ERROR1:										
$ERROR1^{HI}$	3,553	-0.00097	-0.00010	4,977	-0.00083	-0.00000	2.113	0.0347	6.367	0.0001
$ERROR1^{LO}$	3,535	-0.00093	-0.00000	4,949	-0.00064	-0.00000	4.998	0.0001	8.380	0.0001
$ERROR1^{HI\_LO}$	3,488	-0.00004	-0.00000	4,881	-0.00018	-0.00000	2.173	0.0298	2.160	0.0308
ERROR2:										
$ERROR2^{HI}$	3,151	-0.00186	-0.00042	4,220	-0.00182	-0.00030	0.390	0.6967	4.291	0.0001
$ERROR2^{LO}$	3,130	-0.00192	-0.00043	4,187	-0.00167	-0.00026	2.316	0.0206	5.400	0.0001
$ERROR2^{HI\_LO}$	3,007	0.00006	-0.00000	4,023	-0.00012	-0.00000	2.068	0.0387	2.322	0.0202
Panel B: Partition based on analysts' brokerage house affiliation:[4]										
ERROR1:										
$ERROR1^{HI}$	3,443	-0.00100	-0.00011	4,549	-0.00084	0.00000	2.309	0.0210	5.205	0.0001
$ERROR1^{LO}$	3,457	-0.00097	-0.00006	4,543	-0.00072	0.00000	3.725	0.0002	7.663	0.0001
$ERROR1^{HI\_LO}$	3,412	-0.00003	0.00000	4,488	-0.00013	0.00000	1.304	0.1921	1.807	0.0707
ERROR2:										
$ERROR2^{HI}$	3,038	-0.00187	-0.00042	3,869	-0.00183	-0.00033	0.316	0.7518	2.835	0.0046
$ERROR2^{LO}$	3,043	-0.00194	-0.00043	3,957	-0.00171	-0.00028	2.060	0.0395	4.532	0.0001
$ERROR2^{HI\_LO}$	2,907	0.00007	0.00000	3,753	-0.00007	0.00000	1.463	0.1436	1.664	0.0961

[1] Two-sample t-test (with adjustment for unequal variances where appropriate). p-values reported are one-tailed for $ERROR1(2)^{HI}$ and $ERROR1(2)^{LO}$ and two-tailed for the difference variable, $ERROR1(2)^{HI\_LO}$.
[2] p-values reported are one-tailed for $ERROR1(2)^{HI}$ and $ERROR1(2)^{LO}$ and two-tailed for the difference variable, $ERROR1(2)^{HI\_LO}$.
[3] $ERROR1(2)^{HI}$ and $ERROR1(2)^{LO}$ represents the average of ERROR1(2) for the high-ability and low-ability analysts as classified based on prior forecast error. $ERROR1(2)^{HI\_LO}$ represents the difference between $ERROR1(2)^{HI}$ and $ERROR1(2)^{LO}$. The partition between high-ability and low-ability analysts is based on a relative ranking of prior average (mean-adjusted) forecast errors (computed over the prior two years) for all analysts with forecasts for a given firm on Zack's individual analyst estimate history. High-ability analysts have relative rankings greater than 50 percent (with at least two quarters of prior forecasts); Low-ability analysts have relative ranking equal to or less than 50 percent.
[4] Same as footnote 3 above except the partition is based on whether the analyst is associated with a brokerage house listed as one of the top 20 research teams between 1995 and 1998, by *Institutional Investor* magazine. Footnote 23 in the text lists these top brokerage houses.

TABLE 8
Do Conference Calls Benefit All Analysts Equally?
Cross-sectional Regression of Difference in Forecast Error
between High-ability and Low-ability Analysts

Model: $$ERROR1(2)_i^{HI\_LO} = \beta_0 + \beta_1 CC_i + \beta_2 SIZE_i + \beta_3 SURP_{it} + \beta_4 SURP_{it-1} + \beta_5 \Delta AGE1(2)_i^{HI\_LO} + \beta_6 FE_{PRE_i}^{HI\_LO} + \varepsilon_i$$

Panel A: Partition based on prior forecast error[1]

	ERROR1^{HI_LO}		ERROR2^{HI_LO}	
Variable[2]	**Coefficient**	**p-value[3]**	**Coefficient**	**p-value[3]**
Intercept	-0.000068	0.2777	-0.000035	0.5879
CC	0.000065	0.0142	0.000058	0.0310
SIZE	0.000004	0.6267	-0.000006	0.5185
$SURP_t$	-0.002338	0.0070	-0.001864	0.0461
$SURP_{t-1}$	-0.004068	0.0001	-0.003560	0.0001
$\Delta AGE1(2)^{HI\_LO}$	0.004570	0.0001	0.000002	0.0001
$FE_{PRE}^{HI\_LO}$	-0.415812	0.0001	-0.860780	0.0001
	Adjusted R^2 = 0.2987		Adjusted R^2 = 0.6504	
	N = 7,483 firm-quarters		N = 6,314	

Panel B: Partition based on brokerage house association[1]

	ERROR1^{HI_LO}		ERROR2^{HI_LO}	
Variable	**Coefficient**	**p-value[3]**	**Coefficient**	**p-value[3]**
Intercept	-0.000099	0.1758	-0.000088	0.2151
CC	0.000026	0.3696	0.000045	0.1045
SIZE	0.000010	0.2970	0.000002	0.8299
$SURP_t$	-0.004912	0.0001	-0.000991	0.3918
$SURP_{t-1}$	-0.002132	0.0281	-0.002066	0.0260
$\Delta AGE1(2)^{HI\_LO}$	0.000004	0.0001	0.000003	0.0001
$FE_{PRE}^{HI\_LO}$	-0.445257	0.0001	-0.880104	0.0001
	Adjusted R^2 = 0.3081		Adjusted R^2 = 0.6654	
	N = 6,735 firm-quarters		N = 5,727 firm-quarters	

[1] Footnotes 3 and 4 in Table 7 describe the partition.
[2] $\Delta AGE1(2)^{HI\_LO}$ is the difference between the average $\Delta AGE1(2)$ for the high-ability analysts and the low-ability analysts. See Table 3 for definition of $\Delta AGE1(2)$. Footnotes to Figure 1, Table 3 and Table 7 contain definitions of other variables.
[3] The p-values reported are two-tailed.