THE ACCOUNTING REVIEW
Vol. 80, No. 1
2005
pp. 189–219

The Effect of Conference Calls on Analyst and Market Underreaction to Earnings Announcements

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ABSTRACT: I extend prior research on the information content of conference calls by examining whether they accelerate analysts' and investors' responses to the future implications of currently announced earnings. I find that the initiation of conference calls is associated with a significant reduction in the serial correlation in analyst forecast errors, a measure of initial analyst underreaction. I also find that the initiation of conference calls is associated with significant reductions in two measures of initial investor underreaction: (1) post-earnings announcement drift and (2) the *proportion* of the total market reaction to firms' earnings announcements that is "delayed" (i.e., that is attributable to post-earnings announcement drift). The reduction in post-earnings announcement drift surrounding conference call initiation is concentrated in the set of sample firms where drift is most severe (i.e., the smallest, least heavily traded sample firms) while the largest, most heavily traded sample firms do not exhibit significant drift either before or after conference call initiation. Robustness tests, including analyses of matched samples of nonconference call firms, indicate that the results are not driven by general increases in analyst and investor sophistication over time or by contemporaneous increases in the information and trading environments of conference call initiators.

Keywords: *conference call; post-earnings announcement drift; voluntary disclosure.*

Data Availability: *The data used in this study are available from the sources listed in the text.*

I thank members of my dissertation committee: Steve Baginski—Chair, Bob Jennings, Jerry Salamon, and Jim Wahlen for their guidance. I appreciate the helpful comments of two anonymous reviewers. I also thank Andrea Astill, Dave Barrett, Daniel Beneish, Walt Blacconiere, and workshop participants at Boston College, Emory University, The George Washington University, Harvard Business School, Indiana University, University of Michigan, University of Pennsylvania, and Washington University for helpful discussions and comments. I appreciate the programming assistance of Arnie Cowan. I am grateful for the financial support of the KPMG Peat Marwick Foundation. I thank Stan Levine and FirstCall/Thomson Financial for the conference call data used in this study. I also gratefully acknowledge the contribution of I/B/E/S International Inc. for providing earnings per share forecast data. These data have been provided as part of a broad academic program to encourage earnings expectations research.

Editor's note: This paper was accepted by Lawrence Brown, Editor.

Submitted November 2002
Accepted March 2004

I. INTRODUCTION

I extend prior research on the information content of conference calls by examining whether they accelerate analysts' and investors' reaction to the future implications of currently announced earnings. The effect of conference calls on analyst and market earnings expectations is an important question because companies have increasingly used conference calls in recent years to enhance investors' understanding of earnings announcements. Prior studies establish that conference calls are informative to market participants in that they trigger heightened trading and stock price responses (Frankel et al. 1999; Bushee et al. 2003; Kohlbeck and Magilke 2004) and help analysts form more accurate earnings expectations (Bowen et al. 2002). Despite this evidence, it is unclear whether conference calls improve the efficiency of analyst and investor reactions to the future implications of currently announced earnings.

I find that the initiation of conference calls is associated with a significant reduction in the serial correlation in analyst forecast errors, a measure of initial analyst underreaction. I also find that the initiation of conference calls is associated with significant reductions in two measures of initial investor underreaction: (1) post-earnings announcement drift and (2) the *proportion* of the total market reaction to firms' earnings announcements that is "delayed" (i.e., attributable to post-earnings announcement drift). I show that the reduction in post-earnings announcement drift surrounding conference call initiation is concentrated in the set of sample firms where drift is most severe (i.e., the smallest, least heavily traded ones) while the largest, most heavily traded sample firms do not exhibit significant drift either before or after conference call initiation. Robustness tests, including analyses of matched samples of nonconference call firms, indicate that the results are not driven by general increases in analyst and investor sophistication over time or by contemporaneous increases in the information and trading environments of conference call initiators. Overall, my findings are consistent with conference calls resulting in more timely analyst and investor responses to the future implications of current earnings surprises.

Supplemental tests provide mixed evidence on whether, in addition to accelerating analyst and investor reactions to the future implications of current earnings surprises, conference calls increase the total amount of information about the persistence of currently announced earnings that market participants use in the period leading up to the subsequent earnings announcement. I find that the conference-call-related decline in the serial correlation in analyst forecast errors persists when the post-earnings announcement forecast is measured just prior to the subsequent earnings announcement. Since the prevailing forecast just prior to the subsequent earnings announcement incorporates all other information that analysts use during the quarter, conference calls apparently add to the total amount of information released during the quarter about the persistence of previously announced earnings. My evidence is consistent with Bowen et al.'s (2002) contention that conference calls add to the total amount of information that analysts use about forthcoming earnings. By contrast, I find no evidence that conference calls are associated with a decline in post-earnings announcement drift when the return interval is limited to the three-day period ending with the subsequent earnings announcement. Because returns over this shorter return interval are accumulated after investors react to the arrival of all other information during the quarter, my failure to find a reduction in drift for this shorter interval indicates that conference calls do not increase the total amount of information about the persistence of previously announced earnings that investors assimilate during the quarter.

The remainder of my study proceeds as follows. Section II discusses related literature on conference calls and develops hypotheses. Section III describes the sample. Section IV discusses research design and empirical results. Section V provides concluding remarks.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Conference Calls as a Disclosure Medium

Conference calls are an increasingly important voluntary disclosure mechanism for U.S. companies, providing corporate managers with the opportunity to comment on the most recent quarterly results and to highlight their implications for future financial performance. Earnings-related conference calls are held generally within a few hours to a day following the issuance of the earnings announcement press release. A typical conference call includes opening remarks by management (which generally reiterate the important items in the press release) followed by a question-and-answer session with invited analysts, during which time details not contained in the press release are often disclosed.

Several studies have investigated the information content of conference calls. Bowen et al. (2002) address the question of whether conference calls are incrementally informative about future earnings by examining the effect of conference calls on analyst forecasts. They find that the improvement in analyst forecast accuracy surrounding earnings announcements is greater when earnings announcements are accompanied by conference calls. They also find that the accuracy improvement is sustained until the next quarterly earnings announcement, suggesting that conference calls are not merely substitutes for other unobservable disclosures.[1]

Consistent with conference calls providing material information to investors, Frankel et al. (1999) and Bushee et al. (2003) document heightened levels of trading activity and return volatility during conference calls while Kohlbeck and Magilke (2004) document greater abnormal returns (in absolute value) during earnings announcement periods accompanied by conference calls. It is possible, however, that conference calls induce heightened levels of trading and return volatility without improving capital market reactions to earnings announcements (i.e., they may induce excessive volatility as a result of suboptimal investor reaction to the information conveyed).[2] Examining the effect of conference calls on drift provides more direct insight on whether conference calls improve the efficiency of the capital market reaction to earnings announcements.

The Potential Effect of Conference Calls on Analyst and Market Underreaction to Current Earnings Surprises

Earnings for the upcoming quarter can be decomposed into two components: the persistent portion of past earnings and innovations having their first financial statement impact on the next quarter's earnings. Prior findings of both a significant positive correlation between currently announced earnings surprises and subsequent stock returns (e.g., Ball and Brown 1968; Foster et al. 1984; Bernard and Thomas 1990; Bartov et al. 2000) and a positive serial correlation in analyst forecast errors (e.g., Mendenhall 1991; Abarbanell and Bernard 1992; Shane and Brous 2001; Mikhail et al. 2003) suggest that investors and analysts ignore some of the persistent portion of previously announced earnings when forming expectations of future earnings.

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[1] As discussed in the next section, however, it is possible for conference calls to improve expectations of future earnings but that underreaction to current earning surprises still occurs.

[2] Lee (1992) documents that small investors' buying behavior during earnings announcement periods is not related to the nature of the earnings news, suggesting that individual investor trading behavior is not always information-based. Hence, evidence of abnormal trading activity may not reflect the true information content of a conference call. In a similar vein, Bushee et al. (2003) raise the possibility that heightened trading activity and stock return volatility during conference calls may be caused partly by individual investors overreacting to the information conveyed during these calls.

To the extent that drift is due to the market's inefficient processing of earnings information, Soffer and Lys (1999) argue that the release of information that makes the future implications of current earnings surprises more transparent should mitigate investor underreaction, thereby reducing post-earnings announcement drift. This reasoning can be extended to analysts, suggesting that the serial correlation in analyst forecast errors should decline with the arrival of additional information about the persistence of previously announced earnings. Because managers hold conference calls in close proximity to earnings announcements and use them to expound on the current earnings release, conference calls are ideally suited to mitigate underreaction to the current earnings surprise.

It is possible, however, that conference calls improve expectations of future earnings (as demonstrated by Bowen et al. [2002] in the context of analyst forecasts), but that underreaction to current earnings surprises still occurs. This would be the case if conference calls primarily provide information about future earnings that is uncorrelated with the current earnings surprise. For example, a company may disclose plans for a new product rollout during quarter $t+1$ that will have its first financial statement impact on quarter $t+1$'s earnings. Such information should improve analyst expectations of quarter $t+1$'s earnings (as demonstrated by Bowen et al. 2002) and heighten capital market responses (as demonstrated by Frankel et al. 1999; Bushee et al. 2003; Kohlbeck and Magilke 2004), but it would not reduce analyst or investor underreaction because it does not provide information on the portion of quarter t's earnings surprise expected to recur in quarter $t+1$. Therefore, I focus not on whether conference calls improve future earnings expectations (the question that Bowen et al. [2002] addresses), but on whether they improve the efficiency (i.e., the timeliness) with which market participants use current earnings information in forming future earnings expectations.

In order to test whether conference calls accelerate the arrival of information about the persistent portion of the current earnings surprise, I examine if conference calls mitigate initial analyst and investor underreaction by relating conference call use to the serial correlation in analyst forecast errors and to post-earnings announcement drift. I propose two hypotheses, stated in alternative form.

H1: The serial correlation in analyst forecast errors declines for firms that begin regularly using conference calls in connection with their quarterly earnings announcements.

H2: The magnitude of post-earnings announcement drift declines for firms that begin regularly using conference calls in connection with their quarterly earnings announcements.

III. SAMPLE

Treatment Firms

The starting point for my sample used to test the effect of conference calls on the serial correlation in analyst forecast errors is the set of all firm-quarter combinations on I/B/E/S for the period spanning from the first quarter of 1994 through the second quarter of 2000 with at least one analyst meeting two criteria: (1) the analyst's most recent forecast of quarter t's earnings as of ten days prior to quarter t's earnings announcement was less than 90 days old, and (2) the analyst revised his or her forecast of quarter $t+1$'s earnings

in the 30 days subsequent to quarter t's earnings announcement.[3] If a conference call was held in conjunction with quarter t's earnings announcement, the analyst's earnings forecast revision had to have been made subsequent to both the earnings announcement and the conference call so that it reflects the analyst's exposure to both the earnings announcement and the related conference call. I further require observations to have the earnings per share and price data on I/B/E/S needed to calculate price-scaled forecast errors for both quarter t and quarter $t+1$ earnings.

The starting point for the sample used in testing the effect of conference calls on drift consists of all firm-quarters from the Compustat merged tapes for the period, first quarter of 1994 through the second quarter of 2000.[4] After identifying those observations with the necessary data on Compustat and CRSP to calculate standardized unexpected earnings and cumulative abnormal returns, I exclude observations with extreme returns (defined as those in the top or bottom 0.50 percent on any of the return metrics).

For both samples, I impose two restrictions to isolate firms that began conducting conference calls during the sample period and to reduce the influence of confounding factors:

1) Each firm must have been first listed on the FirstCall conference call database during or after the first quarter of 1996.
2) Nonconference call quarters after the first conference call are eliminated from the sample.

FirstCall began tracking conference calls in the second quarter of 1995. Therefore, firms listed on the database from its inception may have first engaged in conference calls prior to 1995. The first requirement is designed to include only firms whose first appearance on the FirstCall database is likely to be the firm's first conference call. Because conference calls may convey information that improves earnings expectations beyond the next quarter, I exclude nonconference call quarters after firms initiate conference calls to increase power for distinguishing between conference call and nonconference call quarters (consistent with the sample selection criteria in Bowen et al. [2002]).

For the sample used to test the serial correlation in analyst forecast errors, I require each firm to have at least seven quarters of complete data prior to the first conference call followed by at least seven quarters in which a conference call was held. This criterion ensures that each firm has a sufficient time-series both before and after the initiation of conference calls in order to detect any differences in analyst underreaction in firm-specific tests. For portfolio tests of drift, I focus on the narrow window consisting of the four quarters prior to the initial conference call quarter and the four quarters commencing with the first conference call quarter. I require each firm to have at least three quarters of complete data in the four quarters immediately prior to the first conference call and three quarters of complete data in the four quarters commencing with the first conference call. This research design choice is made based on an initial examination of the data, which

[3] Mendenhall (1991) and Abarbanell and Bernard (1992) warn that use of consensus forecasts in tests of the serial correlation of analyst forecast errors may overstate the true serial correlation due to the presence of stale forecasts (i.e., forecasts that were not appropriately updated in response to the earnings announcement). I seek to avoid the problem of stale forecasts by only including analysts who revise their quarter $t+1$ forecasts in the 30 days subsequent to quarter t's earnings announcement.

[4] Because 1999 and 2000 were characterized by an unusual run-up in stock prices (particularly on NASDAQ), I perform sensitivity analyses excluding firm-quarters after the fourth quarter of 1998. My results are similar using this reduced sample.

reveals that firms initiating conference calls experience simultaneous increases over time in a number of variables that have been shown to be negatively related to drift including market capitalization, trading volume, price, and institutional ownership (Foster et al. 1984; Bhushan 1994; Bartov et al. 2000). The contemporaneous increases in these variables present a challenge in attributing any observed reductions in drift to the initiation of conference calls. Narrowing the event window in an event study allows the researcher to more plausibly attribute any observed reactions to the event of interest rather than to other contaminating events. Accordingly, I focus on the year before and the year of conference call initiation in order to increase the likelihood that any declines in drift surrounding the initiation of conference calls is attributable to the conference call initiation decision rather than to changes in other factors associated with drift.

These procedures result in a sample of 141 firms and 2,851 firm-quarters for testing the serial correlation in analyst forecast errors and 518 firms and 3,678 firm-quarters for testing post-earnings announcement drift. Panels A and C of Table 1 summarize the sample selection procedures and Panels B and D provide the related descriptive statistics for these samples.

Control Firms

Mikhail et al. (2003) find that the serial correlation in analyst forecast errors declines as analysts gain experience. Hence, any reductions in the serial correlation in analyst forecasts surrounding the initiation of conference calls that I document for my sample of firms may be attributable to increases in experience due to the passage of time. Thus, before concluding that any reductions in the serial correlation in analyst forecast errors that accompanies the initiation of conference calls is due to the incremental information these calls provide about the persistence of current earnings surprises, it is important to distinguish any conference call-related reductions that I document for my sample of firms from a general decline over time.

Similarly, Johnson and Schwartz (2001) show that the profitability of the post-earnings announcement drift trading strategy has declined as the market has become more astute about this anomaly. Hence, any reductions in post-earnings-announcement drift surrounding the initiation of conference calls may be attributable to a general decline in drift over time. Another explanation for any observed decline in drift is that a firm's decision to engage in conference calls either coincides with or results in enhancements in its information environment and/or declines in trading costs that collectively result in a greater volume of informed trading and, hence, lower drift.[5] Specifically, it is possible that a firm experiences increased analyst and institutional investor interest independent of the conference call decision. If so, this increased capital market attention may be what contributes to a decline in drift and any negative relation between conference call initiation and drift may be simply a result of the fact that a firm's initiation decision coincides with this increased analyst and investor interest.[6] Thus, before concluding that any reductions in drift that accompany the

[5] Prior research by Bhushan (1994) finds that post-earnings announcement drift can occur even if some investors correctly perceive the earnings process, but transactions costs inhibit their active trading. Diamond (1985) argues that a credible commitment to forthcoming disclosure can reduce trading costs. Healy et al. (1999) provide empirical evidence that enhanced disclosure (as measured by analyst disclosure ratings) is associated with increased analyst and institutional investor interest and stock liquidity. Hence, it is possible for conference calls to be associated with lower drift over time without providing additional information about the persistence of currently announced earnings if conference calls provide other information that contributes positively to the information environment and lowers transactions costs.

[6] Conference calls limit the need for time-consuming one-on-one interactions so firms are more likely to see justifiable benefits to conference calls as analyst and investor interest increases.

TABLE 1
Sample Selection Procedures and Descriptive Statistics

Panel A: Sample Selection Procedures—Sample for Testing the Serial Correlation in Analyst Forecast Errors

	Firms	Firm-Quarters
Firm-quarters available on I/B/E/S from the first quarter of 1994 through the second quarter of 2000 where there is at least one analyst whose most recent forecast of quarter t's earnings as of ten days prior to quarter t's earnings announcement was less than 90 days old and whose prevailing forecast of quarter $t+1$'s earnings as of 30 days subsequent to quarter t's earnings announcement was revised sometime after quarter t's earnings announcement and, if applicable, the conference call associated with quarter t's earnings announcement.	5,770	50,940
Missing actuals data on I/B/E/S or price data on Compustat	(72)	(776)
Firms with no conference calls during the sample period	(2,276)	(12,611)
Firms whose first appearance on the FirstCall database is before 1996	(849)	(15,400)
Nonconference call quarters after the first conference call	(79)	(4,527)
Firms with less than seven conference call quarters and/or less than seven nonconference call quarters	(2,353)	(14,775)
Sample for tests of H1	141	2,851

Panel B: Descriptive Statistics—Sample for Testing the Serial Correlation in Analyst Forecast Errors

Continuous Variables	Observations	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile
Treatment Firms						
$FERR2_{i,t+1}$	2,851	−0.0004	0.007	−0.0010	0.0017	0.0012
$FERR1_{i,t}$	2,851	0.0003	0.006	−0.0003	0.0003	0.0013
Control Firms						
$FERR2_{i,t+1}$	2,048	−0.0007	0.011	−0.0013	0.0001	0.0013
$FERR1_{i,t}$	2,048	−0.0001	0.012	−0.0005	0.0003	0.0014

Classification Variable	Treatment Firms		Control Firms	
Conference call periods (CC = 1) [%]	1,384	[48.5]	1,043	[50.9]
Nonconference call periods (CC = 0) [%]	1,467	[51.5]	1,005	[49.1]
Total [%]	2,851	[100.0]	2,048	[100.0]

Panel C: Sample Selection Procedures—Sample for Testing Post-Earnings Announcement Drift

	Firms	Firm-Quarters
Firm-quarters available on Compustat from the first quarter of 1994 through the second quarter of 2000	17,243	345,375
Missing Compustat data required to calculate standardized unexpected earnings for quarter t	(4,125)	(138,414)
Missing announcement dates on Compustat or CRSP data required to calculate abnormal returns during the announcement period (i.e., *CARANN*) as well as over the two post-announcement periods (i.e., *BHAR* and *CAR12*)	(3,690)	(88,435)

(*continued on next page*)

TABLE 1 (continued)

Panel C: Sample Selection Procedures—Sample for Testing Post-Earnings Announcement Drift (continued)

	Firms	Firm-Quarters
Trimming of extreme returns (i.e., the extreme .50% of *CARANN*, *BHAR*, and *CAR12*)	(47)	(3,414)
Firms with no conference calls during the sample period	(4,681)	(44,243)
Firms whose first appearance on the FirstCall database is before 1996	(1,063)	(22,192)
Nonconference call quarters after the first conference call	(145)	(34,496)
Firms with less than three quarters of complete data in the four quarters immediately prior to the first conference call and/or less than three quarters of complete data in the four quarters commencing with the first conference call	(2,950)	(10,348)
Firms with insufficient data to calculate *DRIFTFACTORS*	(24)	(155)
Sample for test of H2	518	3,678

Panel D: Descriptive Statistics—Sample for Testing Post-Earnings Announcement Drift

Continuous Variables	Observations	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile
Treatment Firms						
$BHAR_{i,t}$ (%)	3,678	0.924	23.990	−11.929	−0.414	11.132
$CAR12_{i,t}$ (%)	3,678	2.126	13.557	−4.948	1.320	8.527
$CARANN_{i,t}$ (%)	3,678	0.766	7.375	−2.845	0.369	4.027
$SUE_{i,t}$	3,678	0.001	0.062	−0.002	0.002	0.007
Control Firms						
$BHAR_{i,t}$ (%)	3,612	−2.006	22.355	−13.412	−2.114	8.095
$CAR12_{i,t}$ (%)	3,612	0.925	12.967	−5.699	0.306	7.300
$CARANN_{i,t}$ (%)	3,612	0.173	6.640	−2.834	−0.067	3.143
$SUE_{i,t}$	3,612	−0.002	0.047	−0.004	0.002	0.005

Classification Variable	Treatment Firms		Control Firms	
Conference call periods ($CC = 1$) [%]	1,737	[47.2]	1,842	[51.0]
Nonconference call periods ($CC = 0$) [%]	1,941	[52.8]	1,770	[49.0]
Total	3,678	[100.0]	3,612	[100.0]

Variable Definitions:

$$FERR2_{i,t+1} = \frac{(ACT_{i,t+1} - EST_{i,t+1})}{PRICE_{i,t}};$$

$$FERR1_{i,t} = \frac{(ACT_{i,t} - EST_{i,t})}{PRICE_{i,t}};$$

$PRICE_{i,t}$ = firm i's stock price at the end of quarter t;

$ACT_{i,t}(ACT_{i,t+1})$ = actual earnings per share of firm i for quarter t (quarter $t+1$) per I/B/E/S;

$EST_{i,t}$ = the average of the most recent forecast of firm i's earnings for quarter t made by all analysts whose most recent forecast of quarter t's earnings as of 10 days prior to quarter t's earnings announcement was less than 90 days old and who subsequently revised their forecast of firm i's earnings for quarter $t+1$ sometime during the 30 days subsequent to quarter t's earnings announcement. If firm i is a treatment firm that held a conference call related to quarter t's earnings announcement (i.e., $CC_{i,t} = 1$), the revised forecast must have been made after both the earnings announcement and the related conference call;

(*continued on next page*)

TABLE 1 (continued)

$EST_{i,t+1}$ = the average of the prevailing forecast of firm i's earnings for quarter $t+1$ as of 30 days subsequent to quarter t's earnings announcement made by all analysts whose most recent forecast of quarter t's earnings as of ten days prior to quarter t's earnings announcement was less than 90 days old and who subsequently revised their forecast of firm i's earnings for quarter $t+1$ sometime during the 30 days subsequent to quarter t's earnings announcement. If firm i is a treatment firm that held a conference call related to quarter t's earnings announcement (i.e., $CC_{i,t} = 1$), the revised forecast must have been made after both the earnings announcement and the related conference call;

$CC_{i,t}$ = 1 if firm i is a treatment firm that conducted a conference call during the three-day period spanning one day before to one day after the announcement of quarter t's earnings according to FirstCall's conference call database, and 0 otherwise. If firm i is a control firm then $CC_{i,t} = 1$ if quarter t is on or after the corresponding treatment firm's initial conference call quarter;

$PRICE_t$ = firm i's stock price at the end of quarter t;

$BHAR_{i,t+1}$ = the compounded abnormal return for firm i for the period beginning on the second day after quarter t's earnings announcement and ending on the earnings announcement date for quarter $t+1$. It is calculated as the compounded raw return over the return accumulation period less the compounded equally weighted average return over the same return accumulation period for all firms in the same CRSP size decile on the same CRSP exchange index (i.e., NYSE/AMEX or NASDAQ) to which firm i belongs;

$CAR12_{i,t+1}$ = $CAR3_{i,t+1} + CAR3_{i,t+2} + CAR3_{i,t+3} + CAR3_{i,t+4}$ where $CAR3_{i,t}$ is the cumulative abnormal return for the three days ending on quarter t's earnings announcement. It is calculated as the compounded raw return over the return accumulation period less the compounded equally weighted average return over the same return accumulation period for all firms in the same CRSP size decile on the same CRSP exchange index (i.e., NYSE/AMEX or NASDAQ) to which firm i belongs;

$CARANN_{i,t}$ = the compounded abnormal return for firm i for the three days spanning from the day before to the day after the announcement of quarter t's earnings. It is calculated as the compounded raw return over the return accumulation period less the compounded equally weighted average return over the same return accumulation period for all firms in the same CRSP size decile on the same CRSP exchange index (i.e., NYSE/AMEX or NASDAQ) to which firm i belongs; and

$SUE_{i,t}$ = $[(EARN_{i,t} - EARN_{i,t-4})]/CAP_{i,t}$, where $EARN_{i,t}$ = earnings (before extraordinary items and discontinued operations) for firm i in quarter t, and $CAP_{i,t}$ = the market capitalization for firm i at the end of quarter t.

initiation of conference calls is due to the incremental information these calls provide about the persistence of current earnings surprises, it is important to distinguish any conference call-related drift reductions from a general decline in drift over time and from contemporaneous changes in the information environment and trading costs that may reduce drift.

Accordingly, I examine changes in both the serial correlation in analyst forecast errors and post-earnings announcement drift during the sample period for matched samples of firms that never engaged in conference calls. For each treatment firm, I first identify a set of potential matches as the set of firms with the same two-digit SIC code that never engaged in conference calls. For the sample designated for firm-specific tests of the serial correlation in analyst forecast errors, I require the potential matching firms to have at least seven quarters of complete data both prior to and subsequent to the treatment firm's first conference call to ensure an adequate time-series. For the sample designated for use in portfolio tests of drift I require the potential matching firms to have at least three quarters of complete data in the four quarters prior to the treatment firm's first conference call and three quarters of complete data in the four quarters commencing with the treatment firm's first conference call. Thus, the pre- and post-conference call quarters for each treatment firm and the potential match firms are aligned in calendar time.

For each treatment firm, the ideal control firm is one with exactly the same information environment as the treatment firm in both pre- and post-conference call quarters so that

differential changes in analyst and investor reactions to earnings announcements could be most directly attributed to the conference call initiation decision as opposed to other contemporaneous changes in the information environment. Matching only on initial market capitalization (as a measure of the beginning information environment) is imperfect because it leaves open the possibility that the information environments of the treatment and control firms take different paths in post-conference call periods, thus impeding the ability to attribute differential changes in analyst and market reactions solely to the use of conference calls. Matching only on the dollar or percentage change in market capitalization (as a measure of the change in the information environment) is also imperfect because this procedure ignores the fact that the significance of the same dollar or percentage change in market value likely varies depending on the beginning level of market capitalization. In order to identify the set of control firms that are, *on balance*, most similar to the corresponding treatment firms in both pre- and post-conference call periods, I calculate a Euclidean distance measure between each treatment firm and its potential control firms based on two matching criteria: (1) average market capitalization in pre-conference call quarters and (2) average market capitalization in post-conference call quarters. The distance measure is calculated as:

$$\sqrt{(AVEMKTCAPPRE_{treat} - AVEMKTCAPPRE_{control})^2 + (AVEMKTCAPPOST_{treat} - AVEMKTCAPPOST_{control})^2}$$

where:

AVEMKTCAPPRE = average market capitalization in quarters prior to the first conference call, and
AVEMKTCAPPOST = average market capitalization in quarters commencing with the first conference call.

For each treatment firm, I select from the set of potential matches the firm with the smallest distance measure to be the corresponding control firm. This matching algorithm identifies the control firm where the aggregate difference in information environments between the control firm and treatment firm in both pre- and post-conference call periods is minimized. The matching procedures resulted in the identification of matches for 104 firms (a total of 2,048 firm-quarter observations) used to test the serial correlation in analyst forecast errors and 509 firms (a total of 3,612 firm-quarter observations) used to test post-earnings announcement drift. Descriptive statistics on these control samples are presented in Panel B and Panel D, respectively, of Table 1.

Panel B of Table 1 reveals that the interquartile ranges of the forecast error metrics are very similar for the treatment and control firms used to test analyst underreaction. However, the standard deviations of the forecast error metrics are nearly twice as large for the control firms, suggesting the potential presence of extreme observations. To address this concern, the subsequently reported regression results exclude observations identified as extreme (i.e., those with a Cook's D greater than 1 or a studentized residual with an absolute value greater than 2).[7] Panel D of Table 1 reveals that the return metrics of the treatment and

[7] In untabulated analyses, I find that the interquartile ranges remain essentially unchanged for both the treatment and control firms and that the standard deviations of the forecast error metrics for the control firms decline to levels very similar to the treatment firms after removing such observations. Hence, the procedures used to remove extreme observations appear to be successful. As indicated in footnote 11, the regression results are insensitive to inclusion of these observations.

control firms used to test post-earnings announcement drift are substantially different. Specifically, although the standard deviation of returns is similar between the treatment and control firms, the mean and median returns at all intervals are substantially smaller for the control firms. In the drift tests that follow, I control for differences between the treatment and control firms in the magnitude of returns by incorporating separate intercept and slope shifts for treatment and control firms in regressions that pool treatment and control firm observations.

To determine whether the initiation of conference calls coincides with changes in other variables that are associated with the magnitude of drift, I examine the behavior of various transactions cost and information environment-related variables surrounding the treatment firms' conference call initiation decision for both the treatment and control firms used in tests of post-earnings announcement drift. First, I examine changes in market capitalization based on Foster et al.'s (1984) finding of an inverse relation between firm size and the magnitude of drift. Second, I examine changes in institutional ownership based on Bartov et al.'s (2000) finding that drift is negatively associated with institutional ownership. Third, I examine changes in analyst following to provide further insight on changes in the information environment that might accompany the initiation of conference calls. Finally, I examine changes in stock price and dollar trading volume, both of which Bhushan (1994) uses as proxies for transactions costs.

Panel A of Table 2 summarizes pair-wise differences between the treatment and control match firms in both the pre- and post-conference call periods. Despite the matching procedures, the treatment and control firms do differ on a number of dimensions that have been noted in the prior literature (Tasker 1998a; Frankel et al. 1999). In both pre- and post-conference call periods, the treatment firms appear to have more robust information and trading environments than their corresponding matches as evidenced by their substantially higher market values, institutional ownership, analyst following and trading volume (all p-values less than 0.01, two-tailed).[8]

Panel B of Table 2 examines differences in the changes that treatment and control firms undergo surrounding the treatment firms' initiation of conference calls. The treatment firms experienced a $211 million greater increase in market capitalization, a 3.7 percent greater increase in institutional ownership, and a $297 million greater increase in trading volume than the corresponding match firm. These results are consistent with Healy et al.'s (1999) finding that sustained increases in disclosure are associated with increased institutional investor and analyst interest as well as higher liquidity. In subsequent tests of the effect of conference calls on post-earnings announcement drift, I include explicit controls for the levels of and changes in factors associated with drift that are not completely controlled through the matching procedures.

IV. RESEARCH DESIGN AND EMPIRICAL RESULTS

Intertemporal Test of the Association between Conference Call Use and the Serial Correlation in Analyst Forecast Errors

I examine the effect of conference calls on the serial correlation in analyst forecast errors by estimating the following regression separately for each of the 141 firms in the sample designated for testing analyst underreaction.

[8] In untabulated analyses, I find no significant differences between pre- or post-conference call quarters in either the proportion of profit quarters or in the proportion of quarters with positive seasonally differenced earnings. Thus, it does not appear that the conference call initiation decision is associated with changes in the patterns of the signs of earnings levels or earnings changes.

TABLE 2
Comparisons of Treatment and Control Firms

Panel A: Comparison of Treatment and Control Firms Used in Tests of Post-Earnings Announcement Drift Prior to and Subsequent to Treatment Firm's Initiation of Conference Calls

Average in the Four Quarters Prior to Treatment Firm's Initiation of Conference Calls

Variables	n	Treatment Firm Mean [Median]	n	Control Firm Mean [Median]	n	Mean [Median] Pair-wise Difference[a]
$IH_{i,t}$	393	0.398 [0.386]	347	0.349 [0.325]	262	0.070### [0.079]###
$MV_{i,t}$[b]	509	1,687,310 [325,922]	509	816,130 [211,141]	509	871,180### [16,566]###
$PRC_{i,t}$	509	22.94 [19.63]	509	22.81 [17.78]	509	0.13 [1.18]###
$VOL_{i,t}$[c]	509	1,169 [236]	509	575 [131]	509	594### [66]###
$NUMAN_{i,t}$	296	4.36 [3.00]	244	3.41 [2.50]	143	1.40### [1.00]###

Average in the Four Quarters Commencing with the Treatment Firm's Initiation of Conference Calls

$IH_{i,t}$	414	0.439 [0.431]	361	0.355 [0.322]	293	0.095### [0.091]###
$MV_{i,t}$[b]	509	2,022,426 [425,380]	509	940,203 [248,920]	509	1,082,223### [50,576]###
$PRC_{i,t}$[b]	509	24.79 [21.31]	509	23.23 [18.59]	509	1.52 [2.14]###
$VOL_{i,t}$[c]	509	1,654 [375]	509	763 [162]	509	891### [138]###
$NUMAN_{i,t}$	324	4.94 [3.75]	253	3.67 [2.67]	155	1.68### [1.00]###

Panel B: Pair-wise Comparisons of Changes in Information Environment and Trading Cost Variables

Variables	n	Mean [Median] Change in Pre- and Post-Conference Call Means for Treatment Firms	n	Mean [Median] Change in Pre- and Post-Conference Call Means for Control Firms	n	Mean [Median] Pair-wise Difference in Changes[a]
$IH_{i,t}$	393	0.056 [0.030]	347	0.017 [0.007]	262	0.037### [0.0161]###
$MV_{i,t}$[b]	509	335,116 [49,275]	509	124,073 [14,601]	509	211,043### [13,624]###
$PRC_{i,t}$	509	1.84 [1.20]	509	0.46 [0.50]	509	1.38### [0.59]###
$VOL_{i,t}$[c]	509	485 [74]	509	188 [7]	509	297### [43]###
$NUMAN_{i,t}$	289	0.79 [0.58]	227	0.33 [0.00]	131	0.49### [0.42]###

(*continued on next page*)

TABLE 2 (continued)

###, ## Significant at a p-value of less than 0.01 and 0.05, respectively, using a two-tailed test.
[a] The significance of mean pair-wise differences are based on one sample t-tests while the significance of median pair-wise differences are based on the Wilcoxon sign-rank test. All p-values are two-tailed.
[b] Dollars in thousands.
[c] Dollars in millions.

$IH_{i,t}$ = the proportion of firm i's shares held by institutional investors as of the end of quarter t;
$MV_{i,t}$ = firm i's market capitalization as of beginning of the fiscal year to which quarter t belongs;
$PRC_{i,t}$ = firm i's stock price as of the beginning of the fiscal year to which quarter t belongs;
$VOL_{i,t}$ = annual trading volume of firm i's during the fiscal year immediately preceding the fiscal year to which quarter t belongs; and
$NUMAN_{i,t}$ = the number of forecasting analysts for firm i on I/B/E/S at the end of the month preceding quarter t's earnings announcement.

$$FERR2_{i,t+1} = PRE_{i,t} \times [a_0 + a_1 FERR1_{i,t}] + POST_{i,t} \times [a_0' + a_1' FERR1_{i,t}] + \varepsilon_{i,t+1} \quad (1)$$

where:

$$FERR2_{i,t+1} = \frac{(ACT_{i,t+1} - EST_{i,t+1})}{PRICE_{i,t}};$$

$$FERR1_{i,t} = \frac{(ACT_{i,t} - EST_{i,t})}{PRICE_{i,t}};$$

$ACT_{i,t}(ACT_{i,t+1})$ = actual earnings per share for quarter t (quarter $t+1$) per I/B/E/S;
$EST_{i,t}$ = the average of the most recent forecast of firm i's earnings for quarter t made by all analysts whose most recent forecast of quarter t's earnings as of 10 days prior to quarter t's earnings announcement was less than 90 days old and who subsequently revised their forecast of firm i's earnings for quarter $t+1$ sometime during the 30 days subsequent to quarter t's earnings announcement. If firm i is a treatment firm that held a conference call related to quarter t's earnings announcement (i.e., $CC_{i,t} = 1$), the revised forecast must have been made after both the earnings announcement and the related conference call;
$EST_{i,t+1}$ = the average of the prevailing forecast of firm i's earnings for quarter $t+1$ as of 30 days subsequent to quarter t's earnings announcement made by all analysts whose most recent forecast of quarter t's earnings as of 10 days prior to quarter t's earnings announcement was less than 90 days old and who subsequently revised their forecast of firm i's earnings for quarter $t+1$ sometime during the 30 days subsequent to quarter t's earnings announcement. If firm i is a treatment firm that held a conference call related to quarter t's earnings announcement (i.e., $CC_{i,t} = 1$), the revised forecast must have been made after both the earnings announcement and the related conference call;
$PRICE_{i,t}$ = firm i's stock price at the end of quarter t;

$CC_{i,t}$ = 1 if firm i is a treatment firm that conducted a conference call during the three-day period spanning one day before to one day after the announcement of quarter t's earnings according to FirstCall's conference call database, and 0 otherwise. If firm i is a control firm, then $CC_{i,t}$ = 1 if quarter t is on or after the corresponding treatment firm's initial conference call quarter;
$PRE_{i,t}$ = 1 when $CC_{i,t}$ = 0, and 0 otherwise; and
$POST_{i,t}$ = 1 when $CC_{i,t}$ = 1, and 0 otherwise.

Use of a cutoff of 10 days prior to quarter t's earnings announcement to measure *FERR1* is designed to avoid contamination of *FERR1* with analyst exposure to possible earnings preannouncements. Use of a cutoff of 30 days subsequent to quarter t's earnings announcement to measure *FERR2* is designed to avoid the confounding effect of the arrival of other information. The requirement for treatment firms that all forecasts included in *FERR2* during conference call quarters be revised after both the earnings announcement and the related conference call is designed to ensure that the forecasts reflect exposure to both the earnings announcement and the related conference call.[9]

Consistent with Mikhail et al. (2003), I evaluate the significance of the coefficients as well as the significance of differences between various coefficients using two alternative Z-statistics (described in Table 3) calculated using the distribution of t-statistics from the individual firm-level regressions.[10] A positive coefficient on $FERR1_{i,t}$ indicates positive serial correlation in analyst forecast errors, suggesting that analysts do not completely revise their forecasts of $t+1$ earnings to reflect the predictable implications of the unexpected earnings for quarter t. The difference in the coefficients on $FERR1_{i,t}$ in pre- versus post-conference call periods provides a test of H1. If conference calls held at the time quarter t's earnings are announced help analysts react more completely to quarter t's unexpected earnings then $a_1 > a'_1$.

Panel A of Table 3 presents the results of estimating Equation (1).[11] The mean coefficient on $FERR1_{i,t}$ declines from 0.32 in pre-conference call quarters ($p < 0.01$; one-tailed) to 0.15 in post-conference call quarters ($p < 0.01$; one-tailed). The decline of 0.17 is significant ($p < 0.01$; one-tailed), consistent with H1.[12] To ensure that this finding is not a

[9] For example, if firm i held its conference call related to quarter t's earnings announcement one day after the earnings announcement, only analysts who revised their quarter $t+1$ forecasts sometime between the second and 30th day after quarter t's earnings announcement are included in the calculation of *FERR2*. If firm i held its conference call on the same day as quarter t's earnings announcement, analysts who revised their quarter $t+1$ forecasts anytime between the first and 30th day after quarter t's earnings announcement are included in the calculation of *FERR2*.

[10] I obtain similar inferences if I calculate univariate t-statistics based on the distribution of the individual firm-level parameter estimates and if, instead of estimating and summarizing individual firm-level regressions, I perform a single pooled regression on treatment and control firm observations.

[11] The tabulated results for all estimations of Equation (1) presented in Panels A and B of Table 3 exclude observations with a Cook's D greater than 1 or a studentized residual with an absolute value greater than 2. The results are insensitive to including these observations.

[12] Because the procedures for identifying control firms do not yield perfect matches, results for the treatment firms may be driven by contemporaneous increases in these firms' information environments. In order to provide further assurance (beyond the use of control firms) that my results are not simply due to overall increases in these firms' information environments, I classify treatment firms with a percentage change in average market value from pre- to post-conference call periods (a proxy for the overall change in the information environment) above (below) the sample-wide median as having high (low) changes in information environment. Untabulated results reveal that the significant reduction in the serial correlation in analyst forecast errors is of similar strength for both groups, indicating that the overall results are not driven by the subset of treatment firms with the most significant increases in overall information environment. I obtain similar results if I use the raw dollar change in market value as the partitioning variable.

TABLE 3
Intertemporal Test of the Firm-Specific Relation between the Serial Correlation in Analyst Forecast Errors and the Initiation of Conference Calls

Panel A: Summary of Firm-Specific Regressions for all Treatment Firms (Number of Regressions = 141)

$$FERR2_{i,t+1} = PRE_{i,t} \times [a_0 + a_1 FERR1_{i,t}] + POST_{i,t} \times [a_0' + a_1' FERR1_{i,t}] + \varepsilon_{i,t+1} \quad (1)$$

		Pre-Conference Call Quarters		Post-Conference Call Quarters		Pre- versus Post-Conference Call Quarters
Variable	Expected Sign	Mean Estimate (Z-Statistic) [Z′-Statistic]	Number (Percent) of Regressions with $t > 0$	Mean Estimate (Z-Statistic) [Z′-Statistic]	Number (Percent) of Regressions with $t > 0$	Difference in Parameter Estimates (Z-Statistic) [Z′-Statistic]
Intercept	?	−0.0001 (1.14) [1.66]#	72 (51.1)	−0.0001 (−0.92) [−1.39]	74 (52.5)	0.0000 (−1.75)# [−2.43]##
$FERR1_{i,t}$	+	0.3184 (5.94)*** [9.58]***	98 (69.5)	0.1526 (3.27)*** [4.47]***	87 (61.7)	−0.1658 (−2.34)*** [−2.96]***

Average Adjusted R^2 = 31.02%.

(*continued on next page*)

TABLE 3 (continued)

Panel B: Summary of Regressions on the Treatment and Control Firm Pairs (Number of Regressions = 104)

$$FERR2_{i,t+1} = PRE_{i,t} \times [b_0 CONTROL_{i,t} + b_1 TREAT_{i,t} + b_2 FERR1_{i,t} \times TREAT_{i,t} + b_3 FERR1_{i,t} \times CONTROL_{i,t}] + POST_{i,t} \times [b'_0 CONTROL_{i,t} + b'_1 TREAT_{i,t} + b'_2 FERR1_{i,t} \times TREAT_{i,t} + b'_3 FERR1_{i,t} \times CONTROL_{i,t}] + \varepsilon'_{i,t+1} \quad (1a)$$

			Pre-Conference Call Quarters		Post-Conference Call Quarters		Pre- versus Post-Conference Call Quarters
Row	Variable	Expected Sign	Mean Estimate (Z-Statistic) [Z′-Statistic]	Number (Percent) of Regressions with t > 0	Mean Estimate (Z-Statistic) [Z′-Statistic]	Number (Percent) of Regressions with t > 0	Difference in Parameter Estimates (Z-Statistic) [Z′-Statistic]
1	$CONTROL_{i,t}$	?	−0.0002 (1.00) [1.55]	58 (54.3)	−0.0006 (−1.97)## [−3.27]###	47 (45.2)	−0.0004 (−2.05)## [−3.32]###
2	$TREAT_{i,t}$	?	−0.0001 (−0.02) [0.00]	55 (52.9)	−0.0001 (−1.26) [−1.58]	55 (52.9)	0.0000 (−0.80) [−0.97]
3	$FERR1_{i,t} \times TREAT_{i,t}$	+	0.2924 (5.29)*** [7.98]***	73 (70.2)	0.0839 (2.42)*** [2.54]***	61 (58.7)	−0.2085 (−2.61)*** [−3.00]***
4	$FERR1_{i,t} \times CONTROL_{i,t}$	+	0.1214 (2.16)** [2.70]***	58 (57.1)	0.1524 (3.43)*** [6.22]***	63 (60.6)	0.0310 (1.29) [1.42]
5	Row 3 − Row 4		0.1710 (2.04)** [2.08]**	61 (58.7)	−0.0685 (−0.74) [−0.71]	50 (48.1)	−0.2395 (−2.22)** [−1.93]**

Average Adjusted R^2 = 35.10%

(continued on next page)

TABLE 3 (continued)

***, ** Significant at a p-value of less than 0.01 and 0.05, respectively, using a one-tailed test.
###, ##, # Significant at a p-value of less than 0.01, 0.05, and 0.10, respectively, using a two-tailed test.

Panel A of Table 3 provides the summary results from estimating Equation (1) on each of the 141 firms in the sample. Equation (1) stacks pre- and post-conference call observations in a single regression. $PRE_{i,t} = 1$ when $CC_{i,t} = 0$, and 0 otherwise. $POST_{i,t} = 1$ when $CC_{i,t} = 1$, and 0 otherwise. $CC_{i,t}$ is defined as in Table 1.

Each coefficient estimate is the mean of the estimates from the 141 separate regressions. The significance of the coefficient estimates and the significance of the difference in the coefficient estimates between pre- and post-conference call periods are assessed using the following two Z-statistics that are calculated based on the distribution of t-statistics from the 141 separate regressions. Z assumes independence and unit variance while Z′ does not assume unit variance.

$$Z = \sqrt{N - 1}\,\frac{\bar{t}}{\sigma(t)} \text{ and } Z' = \sqrt{N}\left(\frac{\sum_{i=1}^{N} t_i \sqrt{\frac{v_i - 2}{v_i}}}{N}\right)$$

where N = the number of t-statistics to be aggregated, $\bar{t}$ = the mean of the t-statistics across the 141 regressions, $\sigma(t)$ represents the standard deviation of the t-statistics, and v_i = degrees of freedom for t_i.

Panel B of Table 3 provides the summary results from estimating Equation (1a) on each of the 104 treatment/control firm pairs. As in Equation (1), Equation (1a) stacks pre- and post-conference call observations in a single regression. In addition, Equation (1a) reflects separate coefficient estimates for treatment and control firms. Thus, $TREAT_{i,t}$ ($CONTROL_{i,t}$) is an indicator equal to 1 for treatment firm (control) firm observations, and 0 otherwise. The significance of the coefficient estimates and the significance of the differences in the coefficient estimates for the treatment and control firm observations are assessed using the two Z-statistics defined above.

See Table 1 for remaining variable definitions.

result of general experience effects documented by Mikhail et al. (2003), I also estimate the following variant of Equation (1) on each of the 104 treatment-control pairs.

$$\begin{aligned} FERR2_{i,t+1} = {} & PRE_{i,t} \times \begin{bmatrix} b_0 CONTROL_{i,t} + b_1 TREAT_{i,t} + b_2 FERR1_{i,t} \\ \times\ TREAT_{i,t} + b_3 FERR1_{i,t} \times CONTROL_{i,t} \end{bmatrix} \\ & + POST_{i,t} \times \begin{bmatrix} b'_0 CONTROL_{i,t} + b'_1 TREAT_{i,t} + b'_2 FERR1_{i,t} \\ \times\ TREAT_{i,t} + b'_3 FERR1_{i,t} \times CONTROL_{i,t} \end{bmatrix} \\ & + \varepsilon_{i,t+1} \end{aligned} \quad \text{(1a)}$$

where:

$TREAT_{i,t}$ = 1 for treatment firm observations, and 0 otherwise; and
$CONTROL_{i,t}$ = 1 for control firm observations, and 0 otherwise.

Equation (1a) allows the intercepts and coefficients on $FERR1_{i,t}$ in both pre- and post-conference call quarters to vary for treatment and control firms. I test whether the change in the coefficient on $FERR1_{i,t}$ exhibited by the treatment firms is significantly different from the corresponding change exhibited by the control firms. Panel B of Table 3 presents the results of estimating Equation (1a). In pre-conference call quarters, the mean coefficient on $FERR1_{i,t}$ for the treatment firms of 0.29 ($p < 0.01$; one-tailed) is significantly greater than the corresponding mean for the control firms of 0.12 ($p < 0.01$; one-tailed) at $p < 0.05$; one-tailed. Hence, treatment firms appear to suffer from more severe analyst underreaction in pre-conference call quarters, suggesting that inefficient analyst reactions to earnings announcements is a possible motivation for conference call initiation. In post-conference call quarters, the mean coefficient on $FERR1_{i,t}$ for the treatment firms of 0.08 ($p < 0.01$; one-tailed) is insignificantly different from the corresponding mean for the control firms of 0.15 ($p < 0.01$; one-tailed). Hence, analyst underreaction for the treatment firms declines in post-conference call quarters to a level that is indistinguishable from the control firms. The decline in the coefficient on $FERR1_{i,t}$ for the treatment firms of 0.21 is significant at $p < 0.01$; one-tailed while the increase in the coefficient on $FERR1_{i,t}$ for the control firms of 0.03 is insignificant. The change in the coefficient on $FERR1_{i,t}$ for the treatment firms is significantly different from the corresponding change for the control firms at $p < 0.05$; one-tailed. Taken collectively, the evidence in Panel B of Table 3 indicates that the reduction in the serial correlation in analyst forecast errors that treatment firms experience surrounding the initiation of conference calls does not extend to control firms that did not initiate conference calls over the same time period.[13] Therefore, it is unlikely

[13] Past research has shown the sign of earnings to be related to the sign of analyst forecast errors (see, for example, Brown 2001). Therefore, I perform untabulated supplemental analyses to ensure that the results are not driven by different profit patterns for treatment and control firms. I find that the treatment and control firms have fairly small but statistically significant differences in the proportion of profit quarters during both pre- and post-conference call quarters. However, I find insignificant differences between the treatment and control firms in the proportion of quarters with positive analyst forecast errors in both pre- and post-conference call quarters. Therefore, for my sample, differences in the profit pattern of treatment and control firms do not translate into systematic differences between treatment and control firms in the sign of analyst forecast errors. In addition, I find that treatment firms experience no statistically significant change in the incidence of profits surrounding the conference call initiation decision, indicating that a change in the profit pattern is not contributing to the documented decline in the serial correlation in analyst forecast errors for these firms. Moreover, although the control firms experience a fairly small but statistically significant decline in the incidence of profits surrounding the treatment firms' conference call initiation, they do not experience a statistically significant change in the serial correlation in analyst forecast errors surrounding the treatment firms' conference call initiation. This latter finding also suggests that the pattern of profits does not contribute to the documented findings.

that the reduction in analyst underreaction exhibited by treatment firms is attributable to the general experience effects documented by Mikhail et al. (2003).

Intertemporal Test of the Association between Conference Call Use and Drift

Change in Drift for Treatment Firms Surrounding Conference Call Initiation

I relate conference calls to investor underreaction by examining their association with post-earnings announcement drift. Specifically, I estimate the following regression on the 3,678 firm-quarter observations pertaining to my 518 treatment firms.

$$\begin{aligned} BHAR_{i,t+1} = {} & PRE_{i,t} \times [c_0 + c_2 DSUE_{i,t} + c_2 DSUE_{i,t} \times DRIFTFACTORS_i] \\ & + POST_{i,t} \times [c'_0 + c'_1 DSUE_{i,t} + c'_2 DSUE_{i,t} \times DRIFTFACTORS_i] \\ & + \varepsilon''_{i,t+1} \end{aligned} \tag{2}$$

where:

$BHAR_{i,t+1}$ = the compounded abnormal return for firm i for the period beginning on the second day after quarter t's earnings announcement and ending on the earnings announcement date for quarter $t+1$. It is calculated as the compounded raw return over the return accumulation period less the compounded equally weighted average return over the same return accumulation period for all firms in the same CRSP size decile on the same CRSP exchange index (i.e., NYSE/AMEX or NASDAQ) to which firm i belongs;

$DSUE_{i,t}$ = the decile ranking (among all firms meeting initial CRSP and Compustat data requirements) of firm i's standardized unexpected earnings for quarter t, scaled to be between 0 and 1;

$DRIFTFACTORS_i$ = $DRIFTFACTORSpre_i$ for all observations prior to firm i's first conference call and $DRIFTFACTORSpost_i$ for all observations commencing with firm i's first conference call; and

$DRIFTFACTORSpre_i$ = the average of firm i's scores on the following three dimensions: (1) the average decile ranking (among all firms meeting initial CRSP and Compustat data requirements) during pre-conference call quarters of firm i's market capitalization as of the beginning of the fiscal year to which the quarter belongs, scaled to be between 0 and 1, (2) the average during pre-conference call quarters of $BPRC_{i,t}$, which equals 1 if firm i's stock price as of the beginning of the fiscal year to which the quarter belongs is greater than \$10, and 0 otherwise, and (3) the average decile ranking (among all firms meeting initial CRSP and Compustat data requirements) during pre-conference call quarters of firm i's trading volume over the fiscal year preceding the fiscal year to which the quarter belongs, scaled to be between 0 and 1; and

$DRIFTFACTORSpost_i$ = the average of firm i's scores on the following three dimensions: (1) the average decile ranking (among all firms meeting initial CRSP and Compustat data requirements) during post-conference call quarters of firm i's market capitalization as of the beginning of the fiscal year to which the quarter belongs, scaled to be between 0 and 1, (2) the average during post-conference call quarters of $BPRC_{i,t}$, which equals 1 if firm i's stock price as of the beginning of the fiscal year to which the quarter belongs is greater than \$10, and 0 otherwise, and (3) the average decile ranking (among all firms meeting initial CRSP and Compustat data requirements) during post-conference call quarters of firm i's trading volume over the fiscal year preceding the fiscal year to which the quarter belongs, scaled to be between 0 and 1.

Bernard and Thomas (1990) demonstrate that, when standardized unexpected earnings ($SUE_{i,t}$) is scaled to be between 0 and 1, the coefficient on $DSUE_{i,t}$ can be interpreted as the returns to a zero-investment portfolio strategy based on the cross-sectional distribution of previously announced seasonally differenced earnings, where the optimal portfolio weights are determined using ordinary least squares. Prior research has documented a positive coefficient on $DSUE_{i,t}$, which is evidence of profitable trading opportunities based on market underreaction to current earnings surprises. The abnormal return measure used as the dependent variable in tests of drift captures the market's subsequent correction for previous underreaction that had not yet been resolved as of the start of the return accumulation period. In the current study, because the return accumulation period for *BHAR* starts on the second day after quarter t's earnings announcement, c_1 (c'_1) captures investors' subsequent correction of their *initial* underreaction to currently announced earnings during quarters prior to (commencing with) the initial conference call quarter.

I calculate unexpected earnings of firm i in quarter t ($UE_{i,t}$) based on a seasonal random walk model where earnings are earnings before extraordinary items and discontinued operations. I scale $UE_{i,t}$ by market capitalization at the end of quarter t to obtain standardized unexpected earnings for firm i in quarter t ($SUE_{i,t}$). For each calendar quarter, I form deciles on the basis of $SUE_{i,t}$ with 0 representing the smallest magnitudes of *SUE* and 9 representing the largest. $DSUE_{i,t}$, which is the measure of unexpected earnings used in empirical tests, represents the $SUE_{i,t}$ decile rank scaled to be between 0 and 1 (i.e., $DSUE_{i,t}$ = $SUE_{i,t}$ decile rank divided by 9).

$DRIFTFACTORS_i$ represents a composite measure of factors that prior studies have shown to be associated with drift.[14] I include market capitalization based on Foster et al.'s (1984) finding of an inverse relation between firm size and the magnitude of drift. Based on the work of Bhushan (1994), I include stock price and trading volume in order to control for transactions costs. The threshold for the binary classification of stock price is identical to that used in Bhushan (1994) and Bartov et al. (2000). Because of the way the variables that comprise $DRIFTFACTORS_i$ are scaled, $DRIFTFACTORS_i$ has a minimum value of 0 (for firms that were consistently in the bottom deciles of market capitalization and trading

[14] I choose to create a composite measure of factors that contribute to drift rather than allowing these factors to enter equation (3) as separate interactions for the sake of parsimony (since I am not primarily interested in the individual impact of each factor) and in order to minimize multicollinearity arising from the high degree of correlation among the individual factors, which is likely to be more problematic in my relatively small sample than in large-scale studies of drift.

volume and that had a stock price consistently less than \$10) and maximum value of 1 (for firms that were consistently in the top deciles of market capitalization and trading volume and that had a stock price consistently greater than \$10). Because I calculate $DRIFTFACTORS_i$ in pre- (post-) conference call periods based on firms' average measures in pre- (post-) conference call quarters, Equation (2) implicitly controls for contemporaneous changes in the information environment and trading costs that may also serve to reduce drift. Coefficient c_2 (c'_2) represents the marginal effect of increases in factors that have previously been shown to be negatively associated with drift on the profitability of the post-earnings announcement drift strategy in pre- (post-) conference call periods. Accordingly, I both expect c_2 and c'_2 to be less than 0 .[15]

Panel A of Table 4 presents the results of estimating Equation (2) on the treatment and control firms. In pre-conference call quarters, the coefficient on $DSUE_{i,t}$ for treatment firms equals 17.47 percent ($p < 0.01$; one-tailed), which indicates that treatment firms where

TABLE 4
Portfolio Test of the Intertemporal Relation between Conference Calls and Drift

Panel A: All Treatment Firm Observations (n = 3,678)

$$BHAR_{i,t+1} = PRE \times [c_0 + c_1 DSUE_{i,t} + c_2 DSUE_{i,t} \times DRIFTFACTORS_i] + POST \times [c'_0 + c'_1 DSUE_{i,t} + c'_2 DSUE_{i,t} \times DRIFTFACTORS_i] + \varepsilon''_{i,t+1} \quad (2)$$

Row	Variable	Expected Sign	Pre-Conference Call Quarters: Parameter Estimate (t-statistic)	Post-Conference Call Quarters: Parameter Estimate (t-statistic)	Difference between Pre- and Post-Conference Call Quarters: Parameter Estimate (t-statistic)
1	Intercept	?	−1.16 (−1.01)	−2.20 (−1.89)#	−1.04 (−0.64)
2	$DSUE_{i,t}$	+	17.47 (7.38)***	9.09 (3.11)***	−8.38 (−2.23)**
3	$DSUE_{i,t} \times DRIFTFACTORS_i$	−	−19.45 (−6.29)***	−7.00 (−1.92)**	12.45 (2.61)###
4	Row 2 + Row 3		−1.98 (−0.82)	2.09 (0.86)	3.97 (1.18)

Adjusted R^2 = 1.83%.

(*continued on next page*)

[15] In untabulated sensitivity analysis, I recompute $DRIFTFACTORS_i$ for those firms with institutional ownership and/or analyst coverage to include the following additional factors: the average decile ranking during pre- or post- conference call quarters (as applicable) of firm *i*'s percentage of institutional ownership and the average decile ranking during pre-conference call quarters of firm *i*'s analyst following, both scaled to be between 0 and 1. I run all subsequent analyses using this revised measure of $DRIFTFACTORS_i$ (while continuing to use $DRIFTFACTORS_i$ as computed according to the procedures set forth in the main text for the firms not covered by I/B/E/S or CDA/Spectrum). The subsequently reported results are insensitive to this alternative specification.

TABLE 4 (continued)

Panel B: Analysis of Treatment Firms with a Corresponding Control and the Corresponding Control Firms (n = 7,228)

$$BHAR_{i,t+1} = PRE_{i,t} \times \begin{bmatrix} d_0 CONTROL_{i,t} + d_1 TREAT_{i,t} + d_2 DSUE_{i,t} \times TREAT_{i,t} \\ + d_3 DSUE_{i,t} \times DRIFTFACTORS_i \times TREAT + d_4 DSUE_{i,t} \\ \times CONTROL_{i,t} + d_5 DSUE_{i,t} \times DRIFTFACTORS_i \times CONTROL_{i,t} \end{bmatrix}$$
$$+ POST_{i,t} \times \begin{bmatrix} d'_0 CONTROL_{i,t} + d'_1 TREAT_{i,t} + d'_2 DSUE_{i,t} \times TREAT_{i,t} \\ + d'_3 DSUE_{i,t} \times DRIFTFACTORS_i \times TREAT \\ + d'_4 DSUE_{i,t} \times CONTROL_{i,t} + d'_5 DSUE_{i,t} \\ \times DRIFTFACTORS_i \times CONTROL_{i,t} \end{bmatrix}$$
$$+ \varepsilon'''_{i,t+1} \quad (2a)$$

Row	Variable	Expected Sign	Pre-Conference Call Quarters: Parameter Estimate (t-statistic)	Post-Conference Call Quarters: Parameter Estimate (t-statistic)	Difference between Pre- and Post-Conference Call Quarters: Parameter Estimate (t-statistic)
1	$CONTROL_{i,t}$	?	−2.87 (−2.70)###	−5.70 (−5.56)###	−2.83 (−1.92)#
2	$TREAT_{i,t}$	?	−0.92 (−0.82)	−2.42 (−2.13)##	−1.50 (0.94)
3	$DSUE_{i,t} \times TREAT_{i,t}$	+	17.57 (7.62)***	8.81 (3.04)***	−8.76 (2.37)***
4	$DSUE_{i,t} \times DRIFTFACTORS_i \times TREAT_{i,t}$	−	−19.99 (−6.65)***	−6.24 (−1.74)**	13.75 (2.93)###
5	$DSUE_{i,t} \times CONTROL_{i,t}$	+	6.25 (2.49)***	7.12 (2.67)***	0.87 (0.24)
6	$DSUE_{i,t} \times DRIFTFACTORS_i \times CONTROL_{i,t}$	−	−4.35 (−1.29)*	−2.18 (−0.61)	2.17 (0.44)
7	Row 3 − Row 5	?	11.32 (3.32)###	1.69 (0.42)	−9.63 (−1.85)**
8	(Row 3 + Row 4) − (Row 5 + Row 6)	?	−4.32 (−1.26)	−2.37 (−0.69)	1.95 (0.40)

Adjusted R^2 = 1.66%.

(*continued on next page*)

$DRIFTFACTORS_i$ equals 0 suffer from severe underreaction.[16] The coefficient on $DSUE_{i,t} \times DRIFTFACTORS_i$ for the treatment firms in pre-conference call periods is −19.45 percent ($p < 0.01$; one-tailed), consistent with the expectation that drift declines as firms become

[16] Note that the 17.47 percent does not represent the profitability of the drift strategy for the entire sample, only for those firms ranking at the bottom on all the dimensions comprising *DRIFTFACTORS* (in other words, those firms with characteristics that predispose them to the most severe drift). The strategy for the treatment sample as a whole without conditioning on *DRIFTFACTORS* yields a return of 6.67 percent (based on a simple regression of $BHAR_{i,t+1}$ on $DSUE_{i,t}$).

TABLE 4 (continued)

***, **, * Significant at a p-value of less than 0.01, 0.05, and 0.10, respectively, using a one-tailed test.
####, ## Significant at a p-value of less than 0.01 and 0.05, respectively, using a two-tailed test.
[a] The test of differences in the intercept and coefficient estimates from pre- to post-conference call quarters is based on a pooled regression of pre- and post-conference call observations that incorporates intercept and slope shifts for post-conference call observations.

Equations (2) and (2a) stack pre- and post-conference call observations in a single regression. $PRE_{i,t}$ = 1 when $CC_{i,t}$ = 0, and 0 otherwise. $POST_{i,t}$ = 1 when $CC_{i,t}$ = 1, and 0 otherwise. $CC_{i,t}$ is defined as in Table 1. In addition, Equation (2a) reflects separate coefficient estimates for treatment and control firms. Thus, $TREAT_{i,t}$ ($CONTROL_{i,t}$) is an indicator equal to 1 for treatment firm (control) firm observations, and 0 otherwise.

Variable Definitions:

$DSUE_{i,t}$ = the decile ranking of firm i's standardized unexpected earnings for quarter t, scaled to be between 0 and 1;

$DRIFTFACTORS_i$ = $DRIFTFACTORSpre_i$ for all observations prior to firm i's first conference call and $DRIFTFACTORSpost_i$ for all observations commencing with firm i's first conference call;

$DRIFTFACTORSpre_i$ = the average of firm i's scores on the following three dimensions: (1) the average decile ranking (among all firms meeting initial CRSP and Compustat data requirements) during pre-conference call quarters of firm i's market capitalization as of the beginning of the fiscal year to which the quarter belongs, scaled to be between 0 and 1, (2) the average during pre-conference call quarters of $BPRC_{i,t}$, which equals 1 if firm i's stock price as of the beginning of the fiscal year to which the quarter belongs is greater than \$10, and 0 otherwise, and (3) the average decile ranking (among all firms meeting initial CRSP and Compustat data requirements) during pre-conference call quarters of firm i's trading volume over the fiscal year preceding the fiscal year to which the quarter belongs, scaled to be between 0 and 1; and

$DRIFTFACTORSpost_i$ = the average of firm i's scores on the following three dimensions: (1) the average decile ranking (among all firms meeting initial CRSP and Compustat data requirements) during post-conference call quarters of firm i's market capitalization as of the beginning of the fiscal year to which the quarter belongs, scaled to be between 0 and 1, (2) the average during post-conference call quarters of $BPRC_{i,t}$, which equals 1 if firm i's stock price as of the beginning of the fiscal year to which the quarter belongs is greater than \$10, and 0 otherwise, and (3) the average decile ranking (among all firms meeting initial CRSP and Compustat data requirements) during post-conference call quarters of firm i's trading volume over the fiscal year preceding the fiscal year to which the quarter belongs, scaled to be between 0 and 1.

All other variables are as defined previously. See Table 1 for remaining variable definitions.

larger and more actively traded. The sum of the coefficients on $DSUE_{i,t}$ and $DSUE_{i,t} \times DRIFTFACTORS_i$ in pre-conference call quarters equals −1.98 percent, which is insignificant, indicating that drift does not exist for treatment firms where $DRIFTFACTORS_i$ equals 1 (i.e., the largest and most heavily traded firms). In post-conference call quarters, the coefficient on $DSUE_{i,t}$ for treatment firms is 9.09 percent ($p < 0.01$; one-tailed), which represents a decline of 8.38 percent ($p < 0.05$; one-tailed) in the magnitude of underreaction for firms where *DRIFTFACTORS* equals 0 (i.e., the smallest, least heavily traded firms), consistent with H2. The sum of the coefficients on $DSUE_{i,t}$ and $DSUE_{i,t} \times DRIFTFACTORS_i$ in post-conference call quarters equals 2.09 percent, which is both insignificantly different from 0 and insignificantly different from the sum of the coefficients on these same variables

in pre-conference call quarters. Hence, the largest, most heavily traded sample firms do not exhibit significant drift either before or after conference call initiation. The nonexistence of drift for the largest firms is consistent with evidence in Brown and Han (2000), who find in their study of firms whose earnings follow a simple first-order autoregressive process that stock prices fully reflect the future implications of current earnings surprises for the largest firms in their sample.

Comparative Analysis of the Change in Drift for Treatment and Control Firms

To formally test whether the previously documented decline in underreaction for the treatment firms is significantly different from the control firms, I estimate the following expanded version of Equation (2) on the 7,228 firm-quarter observations related to the 509 treatment firms for which a control firm could be identified (3,616 firm-quarters) and the corresponding 509 control firms (3,612 firm-quarters).

$$\begin{aligned} BHAR_{i,t+1} = {} & PRE_{i,t} \times \begin{bmatrix} d_0 CONTROL_{i,t} + d_1 TREAT_{i,t} + d_2 DSUE_{i,t} \\ \times TREAT_{i,t} + d_3 DSUE_{i,t} \times DRIFTFACTORS_i \\ \times TREAT + d_4 DSUE_{i,t} \times CONTROL_{i,t} + d_5 DSUE_{i,t} \\ \times DRIFTFACTORS_i \times CONTROL_{i,t} \end{bmatrix} \\ & + POST_{i,t} \times \begin{bmatrix} d'_0 CONTROL_{i,t} + d'_1 TREAT_{i,t} + d'_2 DSUE_{i,t} \\ \times TREAT_{i,t} + d'_3 DSUE_{i,t} \times DRIFTFACTORS_i \\ \times TREAT + d'_4 DSUE_{i,t} \times CONTROL_{i,t} \\ + d'_5 DSUE_{i,t} \times DRIFTFACTORS_i \times CONTROL_{i,t} \end{bmatrix} \\ & + \varepsilon'''_{i,t+1}. \end{aligned} \tag{2a}$$

Equation (2a) incorporates separate intercepts and slope coefficients for treatment and control firm observations in pre- and post-conference call observations. Specifically, d_0 (d'_0) represents the intercept for control firm observations in pre- (post-) conference call quarters while d_1 (d'_1) represents the intercept for treatment firm observations in pre- (post-) conference call quarters. Coefficient d_2 (d'_2) represents the coefficient on $DSUE_{i,t}$ in pre- (post-) conference call quarters for treatment firm observations while coefficient d_3 (d'_3) represents the coefficient on $DSUE_{i,t} \times DRIFTFACTORS_i$ in pre- (post-) conference call quarters for treatment firm observations. Coefficient d_4 (d'_4) represents the coefficient on $DSUE_{i,t}$ in pre- (post-) conference call quarters for control firm observations while coefficient d_5 (d'_5) represents the coefficient on $DSUE_{i,t} \times DRIFTFACTORS_i$ in pre- (post-) conference call quarters for control firm observations.

Panel B of Table 4 presents the results of estimating Equation (2a). In pre-conference call quarters, the coefficient on $DSUE_{i,t}$ for treatment firms of 17.57 percent ($p < 0.01$; one-tailed) is significantly different from the corresponding coefficient for control firms of 6.25 percent ($p < 0.01$; one-tailed) at $p < 0.01$; two-tailed. This pattern is consistent with the significantly higher serial correlation in analyst forecast errors noted for treatment firms in Panel B of Table 3 and suggests that, while the treatment firms rank significantly higher than their control firm counterparts on traditional measures of information and trading environment (as seen in Table 2), analysts and investors appear to be less able to understand treatment firms' earnings announcement in the quarters prior to their initiation of conference calls. It is conceivable that inefficiency in market reactions to their earnings announcements may motivate firms to initiate conference calls.

In post-conference call quarters, the coefficient on $DSUE_{i,t}$ for treatment firms of 8.81 percent ($p < 0.01$; one-tailed) is 8.76 percent lower ($p < 0.01$; one-tailed) than the

corresponding coefficient for treatment firms in pre-conference call quarters. In post-conference call quarters, the coefficient on $DSUE_{i,t}$ for control firms of 7.12 percent ($p < 0.01$; one-tailed) is insignificantly different from the corresponding coefficient for control firms in pre-conference call quarters. Hence, the decline in drift exhibited by the treatment firms does not extend to the control firms Moreover, the reduction in the coefficient on $DSUE_{i,t}$ for treatment firms is significantly different from the change in the coefficient on $DSUE_{i,t}$ for control firms at $p < 0.05$; one-tailed, indicating that the drift reduction for the treatment firms is not due to the passage of time.

The sum of the coefficients on $DSUE_{i,t}$ and $DSUE_{i,t} \times DRIFTFACTORS_{i,t}$ is insignificant in both pre- and post-conference call quarters for both treatment and control firms. Moreover, the sum of the coefficients on $DSUE_{i,t}$ and $DSUE_{i,t} \times DRIFTFACTORS_{i,t}$ for treatment firms is insignificantly different from the corresponding sum for the control firms in both pre- and post-conference call quarters. In addition, the change in the sum of the coefficients on $DSUE_{i,t}$ and $DSUE_{i,t} \times DRIFTFACTORS_{i,t}$ for the treatment firms is insignificantly different from the corresponding change for the control firms. Collectively, these results indicate no effect of conference calls on the largest, most heavily traded sample firms in post-conference call quarters.[17]

Examination of Post-Earnings Announcement Drift as a Proportion of the Total Stock Price Response to Earnings Announcements

Evidence in the preceding section of a differential decline in drift for treatment firms is consistent with conference calls providing information that helps mitigate investors' initial underreactions to current earnings surprises. A potential concern with interpreting tests of the magnitude of post-earnings announcement drift is that prior research has shown that the value relevance of earnings has declined over time (e.g., Collins et al. 1997; Francis and Schipper 1999). Hence, a decline over time in the magnitude of drift may be attributable to a decline in the overall strength of the earnings-return relation as opposed to the effect conference calls have in making the persistence of earnings surprises more transparent for investors.[18] This alternative explanation is more likely for firms initiating conference calls because Tasker (1998a) shows that firms are more likely to use conference calls when their earnings are less informative.[19] I perform supplemental tests of the effect of conference calls on investor underreaction by examining whether conference calls are associated with declines in the *proportion* of the total stock market reaction to quarter t's earnings announcement that is attributable to drift (hereafter referred to as proportionate drift).[20] Examining proportionate drift as opposed to the raw magnitude of post-earnings announcement

[17] To gain further insight on the pervasiveness of the conference call-related drift reduction, I perform separate regressions of $BHAR_{i,t+1}$ against $DSUE_{i,t}$ and $DSUE_{i,t} \times CC_{i,t}$ for quintiles formed on the basis of *DRIFTFACTORS* (results not tabulated). I find that sample-wide evidence of significant pre-conference call drift as well as of significant conference call-related drift reduction resides in the two bottom quintiles while significant pre-conference call drift and conference call-related change in drift is not apparent in the top three quintiles.

[18] I thank an anonymous referee for this insight.

[19] One of Tasker's (1998a) indicators of less informative earnings is a weak earnings-return relation.

[20] Examining proportionate drift as opposed to the raw magnitude of post-earnings announcement drift effectively controls for any changes over time in the overall strength of the earnings-return relation. If conference calls mitigate investor underreaction, then the proportion of the market's total response to quarter t's earnings announcement that is delayed (i.e., that is attributable to drift) should decline. Another conceivable approach to examining whether conference calls accelerate investors' responses to earnings announcements is to investigate the effect of conference calls on the magnitude of earnings response coefficients (ERC). If conference calls enhance investors' reactions to earnings announcements, conference calls should increase the intensity of investors' responses per unit of earnings news (i.e., the ERC). Such an analysis is beyond the scope of this study.

drift effectively controls for any changes over time in the overall strength of the earnings-return relation. If conference calls mitigate investor underreaction, the proportion of the market's total response to quarter t's earnings announcement that is delayed (i.e., that is attributable to drift) should decline.

In order to measure the decline in proportionate drift surrounding conference call initiation for treatment and control firms, I estimate the following equation, which modifies Equation (2) by accumulating returns over the earnings announcement period (defined as the three days centered on the earnings announcement date) separately for pre- and post-conference call quarter observations.

$$\begin{aligned} CARANN_{i,t+1} = {} & PRE_{i,t} \times [f_0 + f_1 DSUE_{i,t} + f_2 DSUE_{i,t} \times DRIFTFACTORS_i] \\ & + POST_{i,t} \times [f'_0 + f'_1 DSUE_{i,t} + f'_2 DSUE_{i,t} \\ & \times DRIFTFACTORS_i] + \varepsilon''_{i,t+1} \end{aligned} \tag{3}$$

where $CARANN_{i,t}$ = the compounded abnormal return for firm i for the three days spanning from the day before to the day after the announcement of quarter t's earnings. It is calculated as the compounded raw return over the return accumulation period less the compounded equally weighted average return over the same return accumulation period for all firms in the same CRSP size decile on the same CRSP exchange index (i.e., NYSE/AMEX or NASDAQ) to which firm i belongs.

Because the previously discussed evidence of a decline in the magnitude of drift is concentrated in the smallest, heavily traded sample firms, I focus my analysis of the change in proportionate drift on this set of firms (i.e., $DRIFTFACTORS = 0$). I calculate proportionate drift for this set of firms as the ratio of the market's delayed reaction to the earnings surprise (i.e., c_1 or c'_1 from Equation (2)) to the total market reaction to the earnings surprise during the combined earnings announcement and post-earnings announcement windows (i.e., the sum of f_1 from Equation (3) and c_1 from Equation (2) or the sum of f'_1 from Equation (3) and c'_1 from Equation (2)).

Panel A of Table 5 presents the results from estimating Equations (2) and (3) on treatment firms for which a control firm could be identified as well as calculations of proportionate drift based on the resulting parameter estimates. Proportionate drift for the treatment firms where *DRIFTFACTORS* equals 0 declines by 19.8 percent (from 81.76 percent in pre-conference call quarters to 61.96 percent in post-conference call quarters). This decline is significant ($p < 0.05$, one-tailed based on a Chi-Square statistic from a Wald test of nonlinear restrictions), consistent with the corresponding decline in the magnitude of drift. Panel B of Table 5 presents the results from estimating Equations (2) and (3) on the control firms as well as calculations of proportionate drift based on the resulting parameter estimates. The change in proportionate drift for control firms where *DRIFTFACTORS* equals 0 is insignificant, consistent with the insignificant change in the magnitude of drift for these firms documented previously. Untabulated computations show that the changes in proportionate drift for treatment and control firms where *DRIFTFACTORS* equals one are insignificant based on Chi-Square statistics from a Wald test of nonlinear restrictions.

In untabulated analysis, I directly compare the change in proportionate drift for treatment firms to that for the control firms based on a pooled regression of treatment and control firm observations that incorporates intercept and slope shifts for post-conference call and treatment firm observations. Based on the Wald test, the decline in proportionate drift for treatment firms where *DRIFTFACTORS* equal 0 is significantly different from the

corresponding control firms where *DRIFTFACTORS* equal 0 ($p < 0.05$; one-tailed). The change in proportionate drift for treatment firms where *DRIFTFACTORS* equals 1 is not significantly different from the corresponding change for the control firms where *DRIFTFACTORS* equals 1. Overall, the evidence from the analysis of proportionate drift corroborates evidence from the previous analysis of the magnitude of drift.

Do Conference Calls Increase the Total Amount of Information That Market Participants Use about the Persistence of Previously Announced Earnings?

The foregoing evidence is consistent with conference calls *accelerating* analysts' and investors' reaction to the future implications of the current earnings announcement. A related question is whether conference calls increase the total amount of information about the persistence of currently announced earnings that analysts and investors use. To address

TABLE 5
Intertemporal Test of the Effect of Conference Calls on the Proportion of the Total Stock Market Response to Earnings Announcements Attributable to Drift

Panel A: Treatment Firms with a Corresponding Control

$$BHAR_{i,t+1} = PRE_{i,t} \times [c_0 + c_1 DSUE_{i,t} + c_2 DSUE_{i,t} \times DRIFTFACTORS_i] + POST_{i,t} \times [c'_0 + c'_1 DSUE_{i,t} + c'_2 DSUE_{i,t} \times DRIFTFACTORS_i] + \varepsilon''_{i,t+1} \quad (2)$$

$$CARANN_{i,t+1} = PRE_{i,t} \times [f_0 + f_1 DSUE_{i,t} + f_2 DSUE_{i,t} \times DRIFTFACTORS_i] + POST_{i,t} \times [f'_0 + f'_1 DSUE_{i,t} + f'_2 DSUE_{i,t} \times DRIFTFACTORS_i] + \varepsilon''_{i,t+1} \quad (3)$$

	BHAR		*CARANN*	
	Pre-Conference Call Quarters	Post-Conference Call Quarters	Pre-Conference Call Quarters	Post-Conference Call Quarters
Variable	Parameter Estimate (t-statistic)	Parameter Estimate (t-statistic)	Parameter Estimate (t-statistic)	Parameter Estimate (t-statistic)
Intercept	−0.92 (−0.79)	2.42 (−2.07)##	−0.83 (−2.34)##	−1.01 (−2.82)###
$DSUE_{i,t}$	17.57 (7.40)***	8.81 (2.95)***	3.92 (5.39)***	5.41 (5.92)***
$DSUE_{i,t} \times DRIFTFACTORS_i$	−19.99 (−6.46)***	−6.24 (−1.69)**	−1.52 (−1.60)#	−2.79 (−2.46)##
n	3,616		3,616	
Adj. R^2	1.91%		2.00%	

Calculation of Proportionate Drift where *DRIFTFACTORS* = 0:

	Pre-Conference Call Quarters		Post-Conference Call Quarters		Chi-Square Test of Difference
	Estimate	Chi-Square Statistic	Estimate	Chi-Square Statistic	
$c_1/(c_1 + f_1)$ for pre-conference call quarters $c'_1/(c'_1 + f'_1)$ for post-conference call quarters	81.76%	624.23***	61.96%	51.62***	4.60**

(*continued on next page*)

TABLE 5 (continued)

Panel B: Control Firms

$$BHAR_{i,t+1} = PRE_{i,t} \times [c_0 + c_1 DSUE_{i,t} + c_2 DSUE_{i,t} \times DRIFTFACTORS_i] + POST_{i,t} \times [c'_0 + c'_1 DSUE_{i,t} + c'_2 DSUE_{i,t} \times DRIFTFACTORS_i] + \varepsilon''_{i,t+1} \quad (2)$$

$$CARANN_{i,t+1} = PRE_{i,t} \times [f_0 + f_1 DSUE_{i,t} + f_2 DSUE_{i,t} \times DRIFTFACTORS_i] + POST_{i,t} \times [f'_0 + f'_1 DSUE_{i,t} + f'_2 DSUE_{i,t} \times DRIFTFACTORS_i] + \varepsilon''_{i,t+1} \quad (3)$$

	BHAR		*CARANN*	
	Pre-Conference Call Quarters	**Post-Conference Call Quarters**	**Pre-Conference Call Quarters**	**Post-Conference Call Quarters**
Variable	**Parameter Estimate (t-statistic)**	**Parameter Estimate (t-statistic)**	**Parameter Estimate (t-statistic)**	**Parameter Estimate (t-statistic)**
Intercept	−2.87 (−2.79)###	5.70 (−5.74)###	−2.33 (−7.81)###	−1.93 (−6.67)###
$DSUE_{i,t}$	6.25 (2.56)***	7.12 (2.75)***	7.09 (10.01)***	4.14 (5.51)***
$DSUE_{i,t} \times DRIFTFACTORS_i$	−4.35 (−1.33)*	−2.18 (−0.60)	−2.88 (−3.03)###	0.02 (0.02)
n	3,612		3,612	
Adj. R^2	0.56%		4.95%	

Calculation of Proportionate Drift where *DRIFTFACTORS* = 0:

	Pre-Conference Call Quarters		**Post-Conference Call Quarters**		**Chi-Square Test of Difference**
	Estimate	**Chi-Square Statistic**	**Estimate**	**Chi-Square Statistic**	
$c_1/(c_1 + f_1)$ for pre-conference call quarters $c'_1/(c'_1 + f'_1)$ for post-conference call quarters	46.85%	20.46***	63.23%	41.55***	1.31

***, **, * Significant at a p-value of less than 0.01, 0.05, and 0.10, respectively, using a one-tailed test.
###, ## Significant at a p-value of less than 0.01 and 0.05, respectively, using a two-tailed test.
See Tables 1 and 4 for variable definitions.

this question, I re-estimate Equations (1) and (2) using alternative dependent variables designed to capture the amount of analyst and investor underreaction that remains after the arrival of all information during the period leading up to the subsequent quarter's earnings announcement.

The alternative dependent variable used in Equation (1) is the forecast error based on the most recent analyst forecast prior to quarter $t+1$'s earnings announcement. The prevailing forecast just prior to the subsequent earnings announcement incorporates analyst reaction to all information released during the period leading up to the subsequent quarter's earnings announcement. Therefore, estimating Equation (1) using this alternative dependent variable provides insight into whether conference calls add to the total amount of information about the persistence of previously announced earnings that analysts use during the quarter.

The alternative dependent variable used in Equation (2) is $CAR3_{i,t+1}$, which represents the cumulative abnormal return for the three-day period ending on quarter $t+1$'s earnings announcement. This alternative return metric captures the market's subsequent correction of any underreaction remaining after arrival of substantially all information during the period leading up to the subsequent quarter's earnings announcement. Hence, estimating Equation (2) using the alternative return metric provides insight into whether conference calls add to the total amount of information that investors use during the quarter about the persistence of previously announced earnings.[21]

In untabulated analyses, I find that, when the alternative forecast error metric is used to estimate Equation (1), the treatment firms continue to exhibit a decline in the serial correlation in analyst forecast errors surrounding conference call initiation. This finding indicates that conference calls add to the total amount of information that analysts use during the quarter about the persistence of previously announced earnings and is consistent with Bowen et al.'s (2002) contention that conference calls add to the total amount of available information about forthcoming earnings. By contrast, I find no evidence that conference calls are associated with a decline in post-earnings announcement drift for treatment firms when I re-estimate Equation (3) using the alternative return metric. Failure to find a reduction in drift for this shorter interval indicates that, while conference calls increase the timeliness of investor responses to earnings surprises, they are not associated with an increase in the total amount of information that investors use during the quarter about the persistence of previously announced earnings. The seemingly conflicting findings for analysts and investors from this set of tests may be due to a combination of factors including: (1) individual investors' limited access to conference calls during the sample period (which was prior to the passage of the Securities and Exchange Commission's Regulation Fair Disclosure) that may have impeded the complete incorporation of conference call information into prices even in the presence of active trading by institutional investors, (2) investors' potentially incomplete reaction to conference call information in cases where they did have access, and/or (3) investors' potentially incomplete incorporation of the conference call-related information embedded in analysts' forecasts.

V. CONCLUSION

Companies increasingly hold conference calls in conjunction with their earnings announcements. Prior studies show that conference calls induce heightened capital market reactions and help analysts form more accurate earnings expectations. However, aside from Tasker's (1998b) small-scale examination of conference call transcripts, prior work generally provides little insight into the nature of the information disclosed in conference calls. This study adds to our knowledge about the information content of conference calls by

[21] The use of alternative return intervals leading up to next quarter's earnings announcement is consistent with Soffer and Lys (1999). My use in this supplemental analysis of $CAR3_{i,t+1}$, which focuses on the portion of investors' underreaction to previously announced earnings that is resolved at the time of the subsequent quarter's earnings announcement, is based on the fact that conference calls are likely to be most informative about the relation between the current earnings surprise and next quarter's earnings (Bowen et al. 2002). However, for completeness, I also use as an alternative return metric ($CAR12_{i,t+1}$), which I calculate by accumulating abnormal announcement period returns for the first three subsequent quarters and subtracting the abnormal announcement period return for the fourth subsequent quarter. The calculation of $CAR12_{i,t+1}$ acknowledges the Bernard and Thomas (1990) finding that an earnings surprise is a positive (but declining) predictor of returns leading up to the three subsequent earnings announcements and a negative predictor of returns leading up to the fourth subsequent earnings announcement. Therefore, the use of $CAR12_{i,t+1}$, which was also used by Bartov et al. (2000), isolates the portion of the underreaction to previously announced earnings that is corrected at the time of the four subsequent quarterly earnings announcements. My results using $CAR12_{i,t+1}$ are consistent with those using $CAR3_{i,t+1}$.

examining their effect on analysts' and investors' initial underreaction to current earnings surprises.

I find that the initiation of conference calls is associated with a significant reduction in the serial correlation in analyst forecast errors, a measure of initial analyst underreaction. I also find that the initiation of conference calls is associated with a significant reduction in two measures of initial investor underreaction: (1) post-earnings announcement drift and (2) the *proportion* of the total market reaction to firms' earnings announcements that is "delayed" (i.e., that is attributable to post-earnings announcement drift). The reduction in post-earnings announcement drift surrounding conference call initiation is concentrated in the set of sample firms where drift is most severe (i.e., the smallest, least heavily traded sample firms) while the largest, most heavily traded sample firms do not exhibit significant drift either before or after conference call initiation. Robustness tests, including analyses of matched samples of nonconference call firms, indicate that the results are not driven by general increases in analyst and investor sophistication over time or by contemporaneous increases in the information and trading environments of conference call initiators.

Supplemental tests provide mixed evidence on whether, in addition to accelerating analyst and investor reaction to the future implications of current earnings surprises, conference calls increase the total amount of information used by market participants about the persistence of currently announced earnings. While conference calls appear to add to the total amount of information about the persistence of previously announced earnings that analysts consider, I find no evidence that conference calls are associated with an increase in the total amount of information that investors assimilate about the persistence of previously announced earnings. These seemingly conflicting findings may reflect investors' relatively less complete incorporation of conference call information, possibly because of their limited access to conference calls prior to the passage of the Securities and Exchange Commission's Regulation Fair Disclosure and/or because investors historically make less than optimal use of the information reflected in analyst forecasts. Overall, while I provide mixed evidence on whether conference calls increase the total amount of information about the persistence of currently announced earnings that analysts and investors use, I provide consistent evidence that conference calls result in more timely analyst and investor reactions to the future implications of currently announced earnings.

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