6-2012

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Recommended Citation

Eames, M. and Kim, Y. (2012), Analyst vs. Market Forecasts of Earnings Management to Avoid Small Losses. Journal of Business Finance & Accounting, 39: 649-674. doi: 10.1111/j.1468-5957.2012.02289.x

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The authors gratefully acknowledge the helpful comments from an anonymous referee, Martin Walker (editor), David Burgstahler and participants at the 29th Annual Congress of the European Accounting Association and the 2008 American Accounting Association Western Regional and Annual Meetings for helpful comments on earlier drafts. Financial support was provided by the Accounting Development Fund at Santa Clara University.

Analyst vs. Market Forecasts of Earnings Management to Avoid Small Losses

ABSTRACT

Burgstahler and Eames (2003) present evidence that analysts commonly anticipate earnings management to avoid small losses, but often incorrectly predict its occurrence. Here we consider whether the market's behavior mimics that of analysts. Our results suggest that analysts exhibit more forecast optimism in their zero earnings forecasts than in their other small earnings forecast levels, and markets exhibit less relative optimism at this point. At the 271-360 day forecast horizon, we find a reduction in the earnings response coefficient at analysts' zero earnings forecasts and interpret this as reflecting less optimism in market earnings forecasts than in analyst forecasts when analysts forecast zero earnings. This evidence is consistent with the market not following analysts in erroneously predicting earnings management to avoid small losses. We do not find similar evidence for shorter forecast horizons, suggesting that market and analyst forecasts converge towards the end of the year. Finding differences in market and analyst earnings forecasts in this loss avoidance environment raises the possibility of differences in a variety of earnings management and other environments, and sends a general note of caution in using analyst forecasts issued early in the year to proxy market expectations.

JEL Classification: M41, G14, G24,

***Keywords*:** analyst forecasts, earnings management, market forecasts, small losses.

Analyst vs. Market Forecasts and Earnings Management to Avoid Small Losses

I. INTRODUCTION

Burgstahler and Dichev (1997) present evidence of annual earnings management to avoid reporting small losses. Subsequently, Burgstahler and Eames (2003) show that analysts anticipate this form of earning management in their earnings forecasts. They find that late in the year analysts appear to correctly estimate the general extent of earnings management to avoid small losses, while early in the year analysts over-estimate the extent of such earnings management. They also find that analysts are particularly prone to misidentifying the specific instances of this form of earnings management. Analysts exhibit an unusually high level of forecast optimism in their zero earnings forecasts (consistent with the prediction of earnings management that is not realized) and an unusually high level of forecast pessimism for zero earnings realizations (consistent with a failure to predict earnings management that is realized).

We examine whether investors (i.e., markets) and analysts have similar difficulties in correctly anticipating earnings management to avoid small losses when analysts are exhibiting such difficulties (i.e., when analysts forecast zero earnings and when firms report zero earnings). In other words, we consider whether investors are aware of and adjust for the observed biases in analysts' forecasts at zero analyst forecasts and zero earnings.

Researchers often use analysts' earnings forecasts as a proxy for market expectations. Here we consider the efficacy of this proxy in settings reflecting earnings management to avoid small losses and analysts' anticipation of such management. We recognize that instances of zero earnings forecasts are not particularly common and zero earnings realizations are even less so, and thus the economic significance of any differences in analyst and market expectations of earnings at these points may be modest. However, we target differences in analyst and investor

perceptions of earnings management to avoid small losses for two primary reasons: (1) this provides a relatively simplified setting[1] and consequently a directly tractable early step in the comparison of analyst and investor expectations in relation to management to benchmarks and (2) this builds directly on prior research by Burgstahler and Eames (2003). If market and analyst perceptions differ in this particular environment, associated with the benchmark of loss avoidance, then perceptions can differ at other points as well and evidence of a difference can send a general note of caution in using analyst forecasts to proxy market expectations.

Comparing market adjusted returns across analyst earnings forecast levels near zero, we find relatively high returns at zero analysts' forecasts, especially at the 271-360 day forecast horizon. We also find that at the 271-360 day forecast horizon, but not at shorter horizons, the earnings response coefficient at zero analysts' earnings forecasts is less than at other small analyst forecast levels. We interpret these results as indicative of the market exhibiting less relative earnings forecast optimism than analysts when analysts forecast zero earnings early in the year. The general absence of significant returns differences and shifts in the earnings response coefficients at shorter forecast horizons is consistent with a convergence of analyst and market expectations over time for zero analyst forecasts. At zero earnings realizations we observe, at best, modest evidence of relatively higher returns and a relatively positive earnings response coefficient only at the 271-360 day forecast horizon. With an inability to identify a significant differential in analyst forecast bias at zero earnings and this horizon, we cannot assert that the market is attempting to undo analyst bias at this point. The increased earnings response coefficient at this horizon may represent the market's own bias at zero earnings realizations.

[1] The other major earnings benchmarks, prior period earnings and analyst forecasts, are subject to managerial influence which is not the case with the zero benchmark.

The paper is organized as follows. The next section provides a brief discussion of the research issues. Section 3 presents our methodology. Section 4 identifies our data and section 5 presents our results. A final section concludes with a summary and suggestions for future research.

II. RESEARCH ISSUES

This section presents a limited review of the literature relating to earnings management to avoid small losses and analysts' awareness of this behavior. We subsequently consider the equivalency of analyst and market expectations, and link this to our goal of assessing whether markets match analysts in their expectations of earnings management to avoid small losses.

Numerous studies (Hayn 1995, Burgstahler and Dichev 1997, DeGeorge, Patel, and Zechauser 1999) document a discontinuity in the distribution of reported earnings, showing an unexpectedly high frequency of small positive observations and an unexpectedly low frequency of small negative observations, and interpret this discontinuity as evidence of earnings management to avoid small losses. Others have questioned the appropriateness of interpreting the observed discontinuity in the earnings distribution as evidence of earnings management. Dechow, et al. (2003) are unable to link discretionary accruals management to the observed anomaly for U.S. firms, but Gore, et al. (2007) confirm the link for U.K. firms. Beaver, et al. (2007) point out that the anomaly may not be entirely due to earnings management. Their analyses suggest that the asymmetric treatment of income taxes and special items for profit and loss firms explains approximately two-thirds of the discontinuity in the distribution of annual net income. Conversely, Burgstahler and Eames (2003) present evidence suggesting that extraordinary, nonrecurring, and special items are not significantly contributing to the anomaly.[2]

[2] See note 14, Burgstahler and Eames (2003)

Durtschi and Easton (2005) find no anomaly in the distribution of unscaled annual basic EPS including extraordinary and discontinued items, and interpret this finding as evidence that the anomaly observed in prior studies employing earnings scaled by price or market capitalization may be due to the deflation factor rather than the properties of earnings per se.[3] Jacob and Jorgensen (2007) find a significant anomaly at zero earnings for scaled annual earnings ending in the fourth but not the other fiscal quarters. With this, they provide convincing evidence that the basic anomaly presented in the earlier studies cannot be attributed primarily to scaling or the asymmetric tax treatment of gains and losses. Earnings management appears to be the most plausible explanation for the previously observed anomalies.

Burgstahler and Eames (2003) consider whether analysts predict earnings management to avoid losses. They present evidence that analysts both anticipate this management and are unable to consistently identify the specific firms that are managing earnings to avoid small losses. Specifically, they find unusual forecast optimism at zero earnings forecasts (consistent with analysts predicting earnings management when no such management occurs), and unusual forecast pessimism at zero earnings realizations (consistent with analysts failing to forecast earnings management when it does occur).

Analysts are tasked with providing public forecasts of future income statement, cash flow, and balance sheet amounts, as well as trading recommendations and target prices (Bonini et al. 2010, Simon and Curtis 2011). A number of studies have linked analysts' earnings forecast errors with their incentives and cognitive difficulties within this environment. Francis and Philbrick (1993), Lim (1998), and Das et al. (1998) suggest that analysts issue intentionally

[3] Burgstahler (2004) presents evidence that the Durtschi and Easton results are likely driven by a large number of firms with low share prices (i.e., less than $1.50/share) and associated lower incentives and higher costs for engaging in earnings management.

optimistic earnings forecasts in order to please management and thus obtain greater access to managers' private information. Here we have instances where analysts are perceived to not issue forecasts that accurately reflect their earnings expectations. Gu and Wu (2003) argue that in an effort to minimize mean absolute forecast error, analysts forecast median rather than mean earnings. This leads to forecast bias when the distribution of earnings is skewed. They find that earnings skewness is significantly related to analyst forecast optimism. Eames et al. (2002) identify a cognitive bias they call the "objectivity illusion" where analysts' forecast errors are predictably associated with their outstanding recommendations at the time of the forecast. Investors serve as consumers of analyst outputs, and are neither compensated for nor prone to publically disclose their expectations. Considering the differences in analyst and investor roles and reward structures, we anticipate that investors' earnings perceptions can differ significantly from reported analyst forecasts.

While the use of analyst forecasts to proxy for investor expectations is a widespread practice in the accounting and finance literature, relatively few studies have directly considered differences between analyst and investor earnings expectations. Abarbanell et al. (1995) present a theoretical model where investor beliefs reflect both their private information and analyst forecasts. In this model, as the dispersion in analyst forecasts increases investors place relatively more weight on their private information, which leads to the potential for more measurement error when employing the mean analyst forecast as a proxy for investor beliefs. Kasznik and McNichols (2002) present evidence consistent with markets doing a better job than analysts in anticipating the future earnings implications of meeting or beating analysts' current earnings expectations. Athanasakou et al. (2011) consider returns and subsequent analyst forecasts in response to firms achieving analysts' current earnings expectations, and find inconsistencies

suggestive of differences in market and analyst expectations of future earnings. Elgers, et al. (2003) find that the accruals related bias in market earnings expectations exceeds that in analyst earnings forecasts. Conversely, Kang and Yoo (2007) find that analysts overreact more strongly than the market to current accruals. Hughes, et al. (2008) compare predictable market returns and predictable analyst forecast errors, and conclude that analyst earnings forecasts can be a poor proxy for market expectations.

Other studies consider whether markets adjust for perceived bias in analyst forecasts. Keung et al. (2010) find that the earnings response coefficient for earnings surprises in the range from zero to one cent is less than for adjacent ranges. They interpret this as evidence of investor skepticism towards zero and small positive earnings surprises, but the results can also reflect discrepancies in analyst and investor earnings expectations.[4] Their evidence is consistent with firms managing analyst but not investor earnings expectations downward to achieve positive earnings surprises. Easton and Sommers (2007) find that the implied expected rate of return based on current earnings and on realized future earnings are not significantly different, and are significantly less than the implied expected rate based on analysts' earnings forecasts. From this, they conclude that the market sees through the general optimistic bias in analysts' earnings forecasts. Gu and Wu (2003) find that the market adjusts for part of the skewness-induced bias they identify in analyst forecast. Das et al. (2007) find that markets place relatively greater reliance on management as opposed to analyst forecasts when the management forecasts are more conservative than analyst forecasts. Pinello (2008) considers an experimental setting and

[4] When firms achieve the zero earnings benchmark, but not necessarily when analysts forecast zero earnings, it is reasonable to assume some earnings management related skepticism on the part of investors. Then investors may be particular skeptical of, as well as assign a premium to, achieving the zero earnings benchmark. These factors serve to counteract one another, and may account for the Hermann, et al. (2011) finding that zero earnings does not elicit a special net response by investors.

finds that student investors appear to recognize and adjust their earnings expectations for perceived biases in analyst forecasts. Pinello further points out that similar behavior by real investors may explain the observed asymmetrically strong capital market reactions to positive and negative earnings surprises. Here we consider potential differences in analyst and market expectations in the context of achieving the benchmark of zero earnings, where we know analysts exhibit some difficulty in identifying those firms managing earnings to achieve the benchmark.

The above literature suggests that markets may often exhibit superior forecasting performance relative to analysts. While Burgstahler and Eames (2003) find that earnings management to avoid a loss periodically fools analysts, fooling the market is another matter. Here we consider whether the market possesses the ability to correctly anticipate such earnings management under circumstances where we know analysts are having difficulties anticipating this management, i.e., when analysts forecast zero earnings and when firms report zero earnings.

III. METHODOLOGY

Our analyses are grounded in Burgstahler and Eames's (2003) model of earnings management and analysts' forecasts of earnings management to avoid losses. Here we elaborate on their model and identify our means for comparing analyst and market expectations of earnings management to avoid losses when analysts forecast zero earnings and when firms report zero realized earnings.

Burgstahler and Eames (2003) model reported earnings as a function of both pre-managed earnings and a firm-year specific earnings management threshold point, below which earnings will not be managed to avoid reporting a loss. For pre-managed earnings falling in the

interval from this threshold point to zero earnings, earnings will be managed to avoid a loss. Outside this range, the firm will report pre-managed earnings and not engage in earnings management to avoid a loss. Burgstahler and Eames presume that analysts develop their earnings forecasts in much the same manner, as a function of their pre-management earnings expectation and assessment of the earnings management threshold. Thus, earnings forecast errors are a function of the error in analyst predictions of pre-managed earnings and error in analyst assessments of firm-year specific earnings management thresholds.

Using this model, Burgstahler and Eames initially assume that analysts accurately forecast pre-managed earnings and consider the effect of errors in assessing the earnings management threshold on earnings forecast errors at zero reported earnings and zero forecast earnings. Then if analysts accurately assess the earnings management threshold there will be no forecast error at zero forecast and reported earnings. Alternatively, if analysts anticipate a lower (i.e., more negative) than realized earnings management threshold, they will anticipate management in instances in which it does not occur (i.e., in the range of pre-managed earnings levels between the anticipated and realized threshold level) and obtain systematic forecast optimism in their zero earnings forecasts. Finally, if they anticipate a higher (i.e., less negative) than realized earnings management threshold, they will not anticipate management in instances where it occurs (i.e., in the range of pre-managed earnings levels between the realized threshold and the anticipated threshold). This leads to systematic forecast pessimism at zero reported earnings. Finding relative optimism and pessimism at zero forecasts and realized earnings, respectively, Burgstahler and Eames conclude that analysts exhibit difficulties in correctly assessing firm-year specific earnings management to avoid reporting a loss.

Burtgstahler and Eames subsequently assume that analysts accurately forecast the earnings management threshold and consider the effect of errors in forecasts of pre-managed earnings on reported earnings forecast errors at zero reported earnings and zero forecast earnings. If analysts' forecasts of pre-managed earnings and realized earnings both fall in the interval from the earnings management threshold to zero earnings, we have zero forecast error, even if there is error in the forecast of pre-managed earnings. If the forecast of pre-managed earnings falls in this same interval (i.e., analysts report a zero earnings forecast) but realized pre-managed earnings is below the earnings management threshold or above zero, we have forecast optimism and pessimism, respectively. Alternatively, if realized pre-managed earnings falls in the interval from the threshold to zero (i.e., the firm reports zero earnings) but the forecast of pre-managed earnings is below the threshold or above zero, we have forecast pessimism and optimism, respectively. Thus we have no simple unconditional hypotheses regarding the effect of pre-managed earnings prediction errors on forecast errors at zero forecasts and realized earnings.

The model of Burgstahler and Eames (2003) applies equally well to market expectations of pre-managed earnings and market forecasts of threshold levels below which earnings management to avoid a loss is not expected. While the market provides no explicit earnings forecasts where one can assess differential optimism or pessimism at zero earnings realizations and at zero analyst forecasts, there is a long and extensive literature linking earnings surprises and returns (Ball and Brown 1968, Hughes and Ricks 1987, Lopez and Rees 2004, Strong and Walker 1993).[5] An analysis of market returns can provide insights into market earnings surprises, and thus relative optimism and pessimism in market expectations. While we cannot identify instances of markets forecasting zero earnings, analysis of returns at zero analyst

[5] The lack of explicit market forecasts has typically lead researchers to employ time series models and analyst forecasts to obtain proxies for market earnings expectations.

forecasts at least affords us the opportunity to assess whether market and analyst expectations are generally consistent at this point. Similarly, consideration of returns at zero earnings realizations enables us to consider analyst and market consistency at this point.

We employ two approaches for comparing analyst and market earnings expectations at zero analyst forecasts and zero earnings realizations. Both approaches consider forecasts and returns at various forecast horizons. We consider the median forecast for each of four forecast horizons, respectively defined as 1 to 90 ($\hat{E}^{median}_{1,90}$), 91 to 180($\hat{E}^{median}_{91,180}$), 181 to 270($\hat{E}^{median}_{181,270}$), and 271 to 360 ($\hat{E}^{median}_{271,360}$) days prior to the earnings release date reported by Compustat. The related returns intervals are from 1, 90, 180, and 270 days before to one day after the earnings release date. At the three longer horizons we begin the returns interval the day after the end of the forecast interval. For the 1 to 90 day forecast horizon, we begin the returns interval the day before the earnings announcement, i.e., the day the forecast interval ends. This yields three-day returns, and has the ability to capture information leakage prior to the earnings announcement. The use of three-day returns can be problematic only if a forecast is issued on the day before the earnings announcement. For each firm-year, we also consider the single last forecast ($\hat{E}^{last}_{1,360}$) issued by any analyst in the period up to 360 days before the earnings release date, and the related returns interval from the day before to the day after the earnings release date.

In our first approach, we compare returns across earnings and analyst forecast intervals in the vicinity of zero to determine if the pattern of relative returns is consistent with the previously observed analyst forecast optimism (pessimism) at zero forecasted (reported) earnings. Here we focus on market adjusted returns relative to the CRSP value-weighted index. If markets correctly adjust for analyst forecast bias when analysts forecast zero earnings, returns at zero forecasted earnings will be similar to returns at other earnings forecast intervals near zero. If

market expectations are consistent with the relative analyst forecast optimism observed at zero analyst forecasts, we should observe relatively more negative (or less positive) returns at this point in comparison to other small analyst earnings forecast levels, because the markets' earnings surprise will be less positive. Similarly, if markets correctly adjust for analyst forecast bias at zero reported earnings, returns at zero reported earnings will be similar to returns at other earnings intervals near zero. However, if market expectations are consistent with the relative analyst forecast pessimism observed at zero earnings realizations, we expect relatively more positive (or less negative) returns at this point in comparison to other small levels of earnings realizations.

As a second approach for considering the market's anticipation of earnings management to avoid small losses, we model market returns as a function of forecast error, dummy variables relating to analysts' zero forecasts (D1) and zero earnings realizations (D2), a number of control variables, and interactions of these variables with forecast error. Here we include a dummy variable (DMBE) to control for a returns premium to meeting or beating the analyst forecasts (Bartov et al. 2002), and another dummy variable (DLOSS) to control for Hayn's (1995) finding that the returns-earnings association is attenuated by firm losses. The additional control variables for market to book ratio, leverage, beta, size, and earnings persistence follow the definitions in Lopez and Rees (2002). Omitting firm and year subscripts for the sake of brevity, our resulting models are:

$$\begin{aligned} RET = {} & \beta_0 + \beta_1 * FE + \beta_2 * FE * D1 + \beta_3 * DLOSS + \beta_4 * DMBE + \beta_5 * MB + \beta_6 * LEV \\ & + \beta_7 * BETA + \beta_8 * SIZE + \beta_9 * PERSIST + \beta_{10} * FE * DLOSS + \beta_{11} * FE * DMBE \\ & + \beta_{12} * FE * MB + \beta_{13} * FE * LEV + \beta_{14} * FE * BETA + \beta_{15} * FE * SIZE \\ & + \beta_{16} * FE * PERSIST + e \end{aligned} \quad (1)$$

and

$$\begin{aligned} RET = {} & \beta_0 + \beta_1 * FE + \beta_2 * FE * D2 + \beta_3 * DLOSS + \beta_4 * DMBE + \beta_5 * MB + \beta_6 * LEV \\ & + \beta_7 * BETA + \beta_8 * SIZE + \beta_9 * PERSIST + \beta_{10} * FE * DLOSS + \beta_{11} * FE * DMBE \end{aligned}$$

$$+ \beta_{12} * FE* MB + \beta_{13} * FE* LEV + \beta_{14} * FE* BETA + \beta_{15} * FE* SIZE + \beta_{16} * FE* PERSIST + e \quad (2)$$

These equations differ only in the inclusion of the dummy variables reflecting zero analysts' earnings forecasts (D1=1, and 0 otherwise) and zero earnings realizations (D2=1, and 0 otherwise). The remaining variables are defined as follows:

RET = the market adjusted return (relative to CRSP value-weighted index) in the interval from the day after the end of a forecast interval of interest to the day after the earnings release date,[6]
FE = reported less forecasted earnings scaled by the market value of equity.
DLOSS = 1 if earnings is less than zero, otherwise = 0,
DMBE = 1 if FE is $\geq$ 0, otherwise = 0,
MB = the market to book equity ratio at the end of the year,
LEV = long-term debt divided by the sum of long-term debt plus preferred and common equity,
BETA = market beta based on CRSP equally weighted market portfolio,
SIZE = the natural log of total assets, and
PERSIST = indicator variable for earnings persistence, measured based on the E/P ratio decile -- 1 for the decile rankings 3 through 8 and 0 for the rankings 1, 2, 9, and 10.

In regressing returns on analyst forecast errors, we examine the validity of using analyst forecasts as a surrogate for market earnings expectations at analyst forecasts of zero earnings and at zero earnings realizations. If analysts' relative forecast optimism or pessimism at these points is shared by investors and provides no unusually biased estimates of investor expectations, then we expect no differences in the earnings response coefficients at zero analyst forecasts and zero reported earnings. If, however, market expectations are unusually different from analysts' as analysts forecast zero earnings or at zero realized earnings we can expect a difference in the earnings response coefficients at these points.

Here we consider an environment characterized by small levels of analysts' forecasts and realized earnings. Burgstahler and Eames (2003) find that analysts are generally optimistic

[6] We also considered analyses using Jensens' alpha from the Fama-French three factor model (Fama and French 1993) and obtained consistent results. Due to the inherent inability of this second measure to consider our shortest forecast horizons and for brevity, we limit our presentation to analyses of market adjusted returns.

across these levels of forecasts and earnings realizations. If investors are especially less optimistic than analysts when analysts forecast zero earnings we should observe a decrease in the earnings response coefficient for analysts' zero earnings forecasts, for the returns response will result from the investors' surprise, which will be smaller than the analysts' surprise measured relative to the analyst forecasts. On the other hand, if analyst expectations are particularly less optimistic at zero realized earnings and investor expectations are not less optimistic to the same degree, the earnings response coefficient will be greater, because the returns will reflect the investors' surprise, which will be greater than the analysts' surprise we employ in our regressions.

If the market mimics the analysts' unusual forecast optimism at zero forecasts and unusual forecast pessimism in zero realized earnings, we will not observe earnings response coefficient differentials at these points. Presuming that observed returns reflect the gap between realized earnings and the market's prediction of earnings, tests of the coefficients β_2 in equations (1) and (2) will provide evidence regarding any differences in prediction between the market and analysts.

IV. DATA

We obtain actual and forecast annual earnings per share values from the Institutional Brokers Estimate System (I/B/E/S) for the period 1983-2007. I/B/E/S reports actual earnings and broker-analyst earnings forecasts in a manner consistent with I/B/E/S's perceived treatment by the majority of analysts following a specific firm. If an individual analyst reports in a manner inconsistent with this majority then I/B/E/S makes an effort to not include the forecast in the database. This approach permits discrepancies in the measurement of earnings across firms, but I/B/E/S reports that with few exceptions analysts forecast operating earnings of a recurring

nature. For each firm and fiscal year, the I/B/E/S database includes forecasts released at various dates by a number of analysts. To insure comparability of forecast and "actual" earnings, all comparisons are based on the forecast and earnings values reported by I/B/E/S.

As in Burgstahler and Eames (2003), we scale all earnings and forecast per share values from I/B/E/S by the I/B/E/S reported stock price at the beginning of the year. We restrict our analyses to forecasts of annual earnings that meet the following requirements:

(1) the earnings announcement date and prior year market value are available from Compustat,
(2) the firms are neither utilities (SIC codes 4400 to 4999) nor financial(SIC codes 6000 to 6499),
(3) the forecast release date is within 360 days of the Compustat earnings announcement date,
(4) the earnings announcement date is not more than 150 days after fiscal year end, and
(5) actual earnings is available from I/B/E/S.

Financial and utility firms are excluded from the analysis by requirement (2) to eliminate firms subject to earnings management incentives related to unusual regulatory and other factors. Requirement (4) eliminates those few firms which report unusually late, as our classification of forecast horizons relative to the announcement date makes these cases difficult to interpret. Our sample is further restricted by the requirement for CRSP returns.

We focus on last forecasts before the earnings announcement date, and median forecasts in four 90-day intervals (forecast horizons) preceding the earnings announcement date. Our median forecast observations reflect a minimum of three individual forecasts for a firm-year and horizon combination. We conduct individual analyses by forecast horizon, and thus construct separate samples for each horizon. When we focus on relative forecast errors and returns at zero vs. small non-zero forecast levels, we limit our samples to observations where the forecasts fall in the range from -5% to +5% of market value, but permit realized earnings to assume any

value. We contend that comparing forecast errors and returns at zero earnings forecasts with these same measures for very large positive or negative earnings forecasts can distort our analyses and provide little or erroneous insights. Similar arguments can be made in the case of comparisons across realized earnings levels. For these samples, we limit realized earnings to $\pm$ 5% of market value, but permit the forecasts to assume any value.

Table 1 Panel A provides our sample sizes by forecast horizon and test. The sample sizes for the returns distributions tests are determined by the availability of stock return information and forecast or realized earnings in the range from 5% to -5% of market value. The number of sample observations is further reduced for the regression analyses due to the availability of the control variables. For the sample of last forecasts issued by any analyst before the earnings announcement, the mean and median days between the last forecast and the earnings release date are 45 and 23 days, respectively. Ninety percent of last forecasts precede the earnings release date by no more than 109 days, while 25% of last forecasts are within 9 days of the earnings release date. To provide insights regarding our samples we focus on the distribution comparison sample at the 1-90 day horizons. Table 1 Panels B and C present the frequency distributions of years and industries for the 1-90 day distribution comparison sample. The number of observations per year grows substantially over time, with a jump in 1997 and 1998, and a subsequent decline. The majority of these observations are from manufacturing firms. Table 1 Panel D presents the mean, median, and standard deviation of the number of forecasts contributing to the median forecast for the distribution comparison samples at each forecast horizon. Relatively fewer forecasts contribute to the median in the last 90-day forecast interval before the earnings announcement. Prior to this forecast interval, the number of forecasts remains quite constant with a median of 7 for all preceding 90-day forecast periods.

V. RESULTS

Introduction

We organize our results into three sections. In the first, we present evidence regarding whether our data reflects earnings management and analysts' anticipation of earnings management in a manner similar to the evidence in Burgstahler and Eames (2003). We subsequently consider evidence regarding differences in returns across small and zero levels of forecasts and earnings. Finally, we examine whether the association between returns and analyst forecast errors exhibits unusual behavior at zero earnings and zero forecast observations.

Our results suggest continuous trends in the patterns observed across forecast horizons during the year. For brevity, our presentation and discussion of results often focus on the last forecasts among all the analysts for a firm-year observation and median forecasts for the 91 to 180 day and 271 to 360 day periods prior to the earnings release date.

Evidence of Realized and Anticipated Earnings Management to Avoid Small Losses

Since our sample differs from that of Burgstahler and Eames (2003) by the use of a different database of analyst forecasts, the addition of data for the years 1983 through 1985 and 1997 through 2007, and the requirement for returns data, we first check our sample for evidence of earnings management to avoid losses and evidence that analysts anticipate such management. Figure 1 presents frequency distributions for realized earnings as well as forecast earnings, employing an interval width of 0.005 and range of -0.03 to +0.03, where the intervals are defined to include their lower boundaries and exclude their upper boundaries. The distributions for realized and forecast earnings and results of significance tests (not reported) mimic those reported by Burgstahler and Eames (2003).

To ascertain whether analysts correctly anticipate instances of earnings management to avoid small losses, Burgstahler and Eames consider quartiles of forecast error by both earnings levels and forecast levels. For consistency with Burgstahler and Eames (2003), and because comparisons at the quartile levels may offer greater insight than is readily available from comparisons of means and medians alone, we replicate their approach. Figure 2 and Table 2 present analyst annual forecast error quartiles for intervals of scaled forecast earnings from -.03 to .03. Here we use the same .005 interval width as in Figure 1, but separately report results for exact zero forecasts. For all forecast horizons we observe evidence of greater forecast optimism (i.e., more negative forecast error), reflected in the lower and median quartiles of the distributions of forecast error at zero earnings forecasts than for surrounding intervals of earnings forecasts. To assess the statistical significance of the effects observed in the forecast error quartiles at zero earnings forecasts, we employ the quartile difference statistic outlined in Burgstahler and Eames (2003), equal to the quartile value for an earnings forecast interval less the average of the corresponding quartile values for the two immediately adjacent forecast intervals. We assess the significance of these statistics on the basis of one-tailed approximate randomization tests (Noreen 1989).[7] These tests indicate the first quartile and median values for all forecast horizons are significantly less than for the adjacent earnings forecast intervals ($p < .001$).

Figure 3 and Table 3 present analyst forecast error quartiles for intervals of reported earnings, again employing the range from -.03 to .03, an interval width of .005, and separately

[7] These tests assess significance based on a reference distribution generated by calculating test statistic values under conditions where the null hypothesis of no differences in returns distributions across forecast categories holds by construction. We generated 999 realizations of the test statistic using randomization procedure. The computed significance level of the original observed value of each quartile difference is assessed using a one-tailed test for the alternative hypothesis, assessed as (1+ number of randomly generated pseudo-quartile differences < QD_i)/(1+999).

identifying exact zero earnings realizations. Here we observe modest to no relative forecast pessimism at zero earnings. Like Burgstahler and Eames (2003), we observe no substantial forecast pessimism at the 271-360 day horizon, and then only modest and sporadic indications of relative pessimism for zero reported earnings at the shorter forecast horizons. Among our quartile difference statistics, only for the upper quartile for last forecasts and the lower quartile for 91-180 day forecasts do we obtain significant evidence of relative forecast pessimism at zero reported earnings (p=.005 and .095, respectively). Burgstahler and Eames (2003) obtain significant quartile difference statistics only for the median and third quartile of last forecasts and the third quartile of 1-90 day forecasts. They do not present results for 91-180 day forecasts. Comparing our results with those of Burgstahler and Eames (2003), we find consistency in significance only for the upper quartile of last forecasts and less apparent pessimism in our data than theirs. This latter finding may be attributable to our data including a substantial proportion of more recent observations and a diminution over time in relative analyst forecast pessimism at zero reported earnings. Collectively our results provide significant evidence of relative analyst forecast optimism at zero forecasts for all forecast horizons. The evidence of relative analyst forecast pessimism at zero earnings realizations is weak at best.

Comparisons of Returns across Small and Zero Forecasts and Earnings

To gain insights into the market's expectation of earnings management to avoid small losses and see if it is consistent with analysts' optimism at zero forecasts, Figure 4 and Table 4 present quartiles of market adjusted returns at various forecast horizons for analysts' earnings forecast levels in the vicinity of zero. At all forecast horizons we observe relatively higher returns at zero forecasts in the lower quartiles, though this is significant only for the last and 271-360 day horizons (p=.013 and .001, respectively). The median values for the last and 271-360

day horizons also suggest relatively higher returns at zero forecasts, but the value is significant only for the 271-360 day forecast (p=.048). The relatively higher market adjusted returns at zero analyst earnings forecasts than for the adjacent forecast levels are consistent with relatively less market optimism at this point and contrast with the relative optimism manifest in analysts' forecasts of zero earnings. This diminution in market optimism at zero analyst forecasts could be the result of markets excessively adjusting for a perceived differential optimism in analyst forecasts of zero earnings. It is certainly not consistent with markets following analysts when analysts are incorrectly anticipating earnings management to avoid small losses.

A comparison of market returns across earnings levels addresses whether markets exhibit the same pattern of forecast errors we observe for analysts in Figure 3 and Table 3. To consider market returns across earnings levels and time horizons, Figure 5 and Table 5 present quartiles of market adjusted returns for earnings intervals in the vicinity of zero. For last forecasts we observe significantly lower returns in the upper quartile at zero realized earnings (p=.009) than in the adjacent realized earnings intervals. At the 91-180 day horizon we observe mixed results and no significance in any of the quartile values. At the 271-360 day horizon we observe higher returns in all the quartile values, but this difference is significant only in the first quartile (p=.017). Our results are modestly supportive of markets exhibiting relative pessimism for zero earnings realizations early in the year and then relative optimism late in the year. Given the weak results from our quartile difference tests for analyst forecast errors and returns across earnings levels, it is difficult to draw general conclusions with respect to zero realized earnings.

Analysis of the Association between Forecast Error and Returns

The preceding tests consider market returns across levels of earnings forecasts and realized earnings. These present the opportunity to assess market earnings forecast optimism and

pessimism across analyst forecast and realized earnings levels, but provide no direct comparisons of market and analyst expectations. Our second set of tests offers the opportunity to compare market and analyst expectations at analysts' zero earnings forecasts and zero realized earnings.

We thus turn our attention to the existence of a differential behavior in the association between analyst forecast errors and returns at zero earnings and analysts' zero earnings forecasts. Table 6 Panel A presents estimation results for equation (1), which incorporates a number of control variables and a dummy variable to permit the earnings response coefficient to differ at analysts' zero earnings forecasts. Estimating equation (1) for our five forecast horizons, we find a preponderance of non-significant coefficient estimates at the shorter forecast horizons. For the three longest horizons we obtain significantly positive coefficient estimates for FE.[8] The coefficient estimate for FE*D1 is significantly negative at the 1% level for the 271-360 day horizon, and non-significant at the other horizons. This reduction in the earnings response coefficient for analysts' zero earnings forecasts at the 271-360 day horizon suggests an increase in the difference between analyst and market expectations at this point. The increased difference at our longest forecast horizon is consistent with analysts early in the year being unusually more optimistic than markets when analysts are forecasting zero earnings. Collectively, our results suggest a significant difference in market and analyst expectations early in the year, and a subsequent convergence of expectations during the year.

Table 6 Panel B presents estimation results for equation (2), where the dummy variable permits the earnings response coefficient to differ at zero realized earnings. Again, the explanatory power of the equations and the frequency of significant coefficients tends to increase with a lengthening of the forecast horizons. Surprisingly, the coefficient estimate for the forecast

[8] Significance levels in these and all subsequently reported regressions are determined via clustering errors at the firm and year levels (Petersen 2009).

error is negative and significant for the 1-90 day horizon. This is likely due to the inclusion of FE*DMBE in the regression. In a simpler model at this horizon, including only FE and FE*D2 as independent variables, the coefficient estimate on forecast error is positive and significant at the one percent level. In the full model, note that the coefficient on FE*DMBE is positive, significant, and of greater magnitude than the coefficient on FE, netting a positive coefficient for firms that meet or beat the analyst forecast. The coefficient estimates for FE*D2 are neither positive nor significant at all forecast horizons shorter than 271-360 days. While in Table 2 we identify a modest level of relative pessimism in analyst forecasts of zero earnings only at the shortest forecast horizons, now it is only at the 271-360 day horizon that we have a positive and modestly significant (10% level) coefficient estimate for the interaction term. The significant coefficient on FE*D2 at the 271-360 day horizon might be capturing the market's attempt to undo analyst bias if the analyst bias exists. Given that we do not find such analyst bias, the positive coefficient on FE*D2 may represent the market's own bias.

Institutional Ownership and Differences between Analyst and Investor Expectations

We previously outlined why and how analysts' reported and market earnings expectations might differ. Differences between market and analyst expectations may increase or decrease with the level of investor sophistication. Here we consider the role of institutional ownership in influencing the difference between analyst and investor expectations at zero forecasts and zero earnings realizations. Sophisticated institutional investors may more closely follow their private information, and thus increase the difference between analyst and investor expectations, or they may more closely follow analysts than the average investor, thus decreasing the differences. That is, institutional investor ownership could contribute to or diminish the

differences between analyst and market expectations. Thus, we have no directional hypothesis for institutional ownership.

To consider the impact of institutional ownership, we focus on the 271-360 day forecast horizon, for only at this horizon did we find significant coefficient estimates for $ß_2$ in equations (1) and (2). In our initial approach to assessing this impact, we define the variable IO (=1 for institutional ownership greater than the median value of 43%, and zero otherwise), and add this variable and the interaction terms D1*IO, FE*IO, and FE*D1*IO to equation (1) and the terms D2*IO, FE*IO, and FE*D2*IO to equation (2). We find the coefficient estimates for FE*D1*IO and FE*D2*IO at the 271-360 day forecast horizon are negative but not significant.[9] In additional tests, we split the sample at the median value of fractional institutional ownership, estimate equations (1) and (2) separately for the two samples, and focus on the coefficient estimates for FE*D1 and FE*D2. The coefficient estimates for FE*D1 are significantly negative for both the high and low ownership samples. In neither sample was the coefficient estimate for FE*D2 significant. These results are consistent with our results in Table 6, but are not consistent with institutional ownership contributing to a significant difference in analyst and investor expectations at zero analyst forecasts and zero realized earnings.

VI. CONCLUSIONS AND DISCUSSION

Burgstahler and Eames (2003) find annual analyst earnings forecasts are relatively optimistic when they forecast zero earnings, and relatively pessimistic for observations of zero realized earnings. They interpret these results as consistent with analysts commonly forecasting earnings management to avoid small losses when such management is not occurring, and analysts failing to correctly anticipate instances of such management. The focus of our study is

[9] Employing the same regression to the shorter forecast horizons, we again find non-significant coefficient estimates for these interaction terms.

to examine the markets' ability to correctly forecast earnings management to avoid small losses when analysts are exhibiting apparent difficulties. To this end, we consider relative market forecast error when analysts forecast zero earnings and when firms report zero earnings. Lacking explicit market forecasts, we focus on market returns and obtain results suggestive of higher returns and thus reduced market optimism when analysts forecast zero earnings. Less optimistic market expectations at zero analyst forecasts contrasts with the greater optimism observed in analyst zero earnings forecasts relative to other small earnings forecasts. For zero earnings realizations, we obtain limited evidence of investors exhibiting relative optimism late in the year and pessimism early in the year.

Our regression tests yield significant evidence of a shift in earnings response coefficients only at the 271-360 day horizon, suggesting a relative difference in analyst and investor expectations of earnings management to avoid losses early in the year, and then a convergence of expectations. These regression results indicate that at the longest horizon markets are unusually less optimistic than analysts when analysts forecast zero earnings. Collectively, our distributional and regression tests suggest that at least at the longest horizon investors can make adjustments to correct for the relative analyst forecast optimism at analysts zero earnings forecasts.

A particularly interesting finding in this paper is the observed differential discrepancy between market and analyst expectations of earnings. Analysts represent a small subset of the market, and are subject to a variety of forces that are not perfectly aligned with the pursuit of market returns. Markets can draw on a broader set of information and competitive analyses. Furthermore there is some evidence that analysts might not always be reporting their true expectations regarding firm performance. Thus we do not expect markets to blindly align with

analyst reported expectations. In this sense it is not entirely surprising that market and analyst reported expectations might differ. While we have considered the potential for differences in the context of zero earnings forecasts and realizations, further research is needed to identify additional circumstances where analyst forecasts may provide particularly poor proxies for market expectations.

The remaining benchmarks of last period's earnings and analyst forecasts offer opportunities for future research. Research targeting differences in analyst and investor perceptions of forecast and earnings management to meet or beat analyst forecasts may prove especially interesting. Keung el al. (2010) show that investors can react relatively negatively to firms meeting or beating the analyst earnings forecast by a cent or less per share. This result could reflect investor skepticism, as Keung et al. propose, as well as error in presuming an equivalency between investor and analyst expectations. If investors are more optimistic than analysts when firms just meet or beat the analyst forecast, then we should expect relatively negative returns at these observations. That said, this venue may present particular difficulties for if firms can manage forecasts as well as earnings we have the additional issue of assessing differences in investor and analyst responses to forecast management.

A substantial benefit to our current consideration of earnings management to avoid small losses is that it abrogates the need to directly consider earnings forecast guidance in relation to the benchmark of zero earnings. While such guidance and the endogenous nature of forecasts may play a role in considering management to avoid negative earnings surprises, where the benchmark is subject to guidance, such guidance cannot play a role in determining the benchmark for loss avoidance, since the zero earnings benchmark is not in itself subject to management. A similar argument can be made for consideration of earnings management to avoid an earnings decrease, for

here again the benchmark is not subject to manipulation across the earnings forecast horizon. Unfortunately, the extremely low incidence of forecasted and realized zero changes in earnings presents substantial difficulties for tests relating to this benchmark.

Finally, it would certainly be interesting to consider differences in analyst and market expectations in instances of firms simultaneously achieving more than one of the three major earnings benchmarks. Here the relatively low incidence of simultaneously achieving more than one of the benchmarks creates substantial difficulties for any tests.

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Figure 1. I/B/E/S Realized and Forecast Earnings, Scaled by Market Value

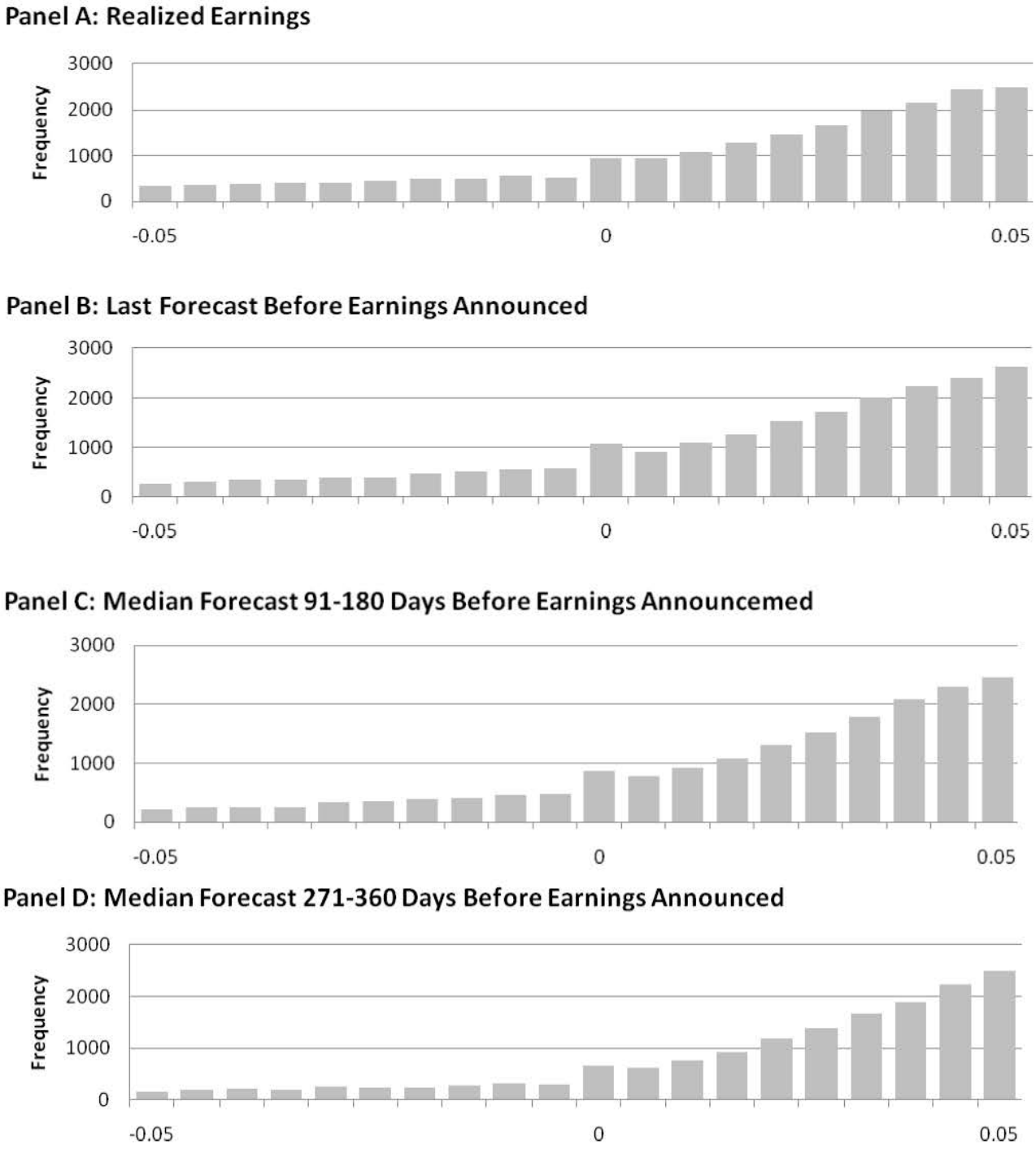
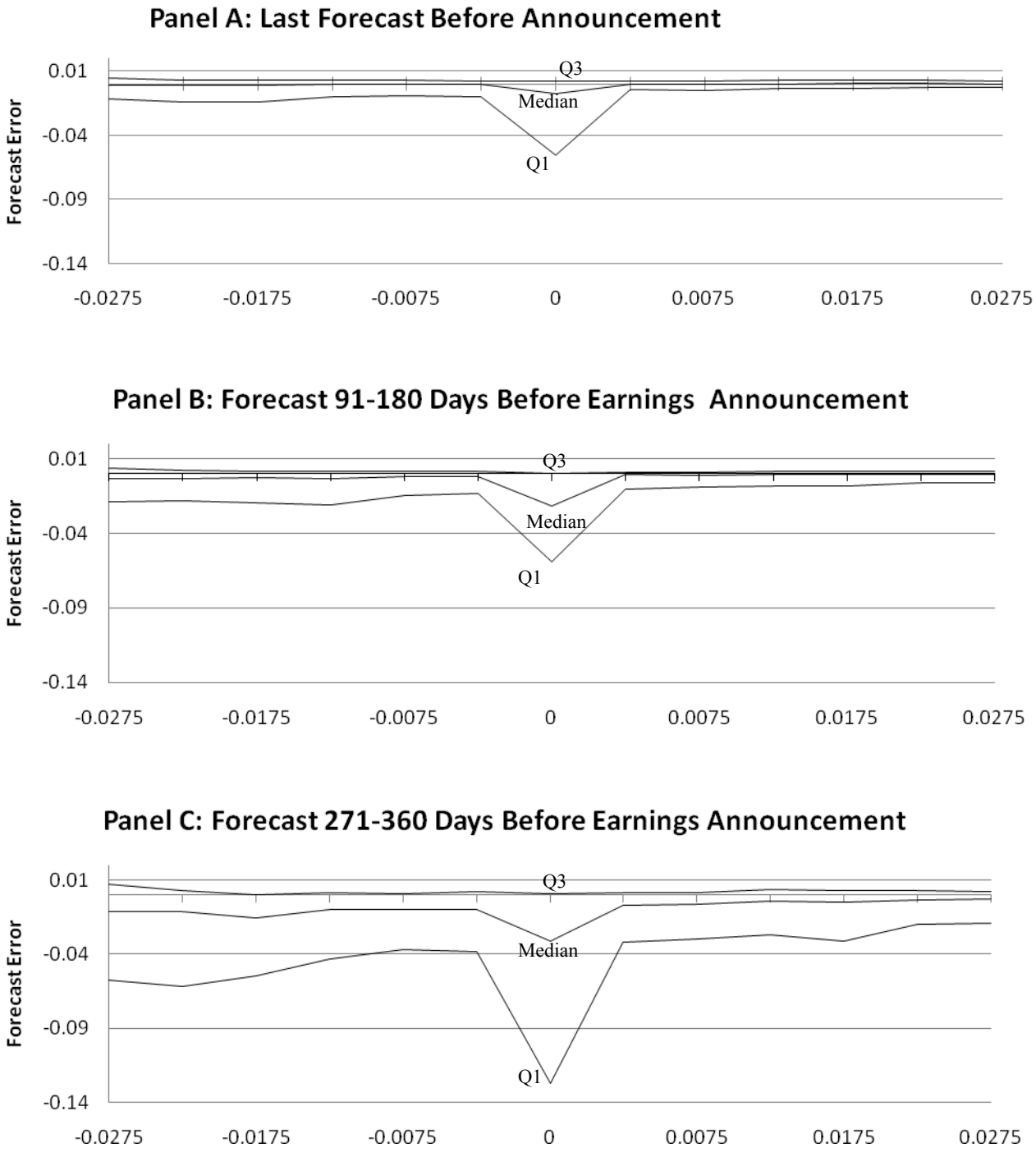


Figure 2. Quartiles of Earnings Forecast Error by Forecast Earnings, Scaled by Market Value
(Forecast Error = Actual – Forecast)



Q3

Figure 3. Quartiles of Earnings Forecast Error by Realized Earnings, Scaled by Market Value
(Forecast Error = Actual – Forecast)

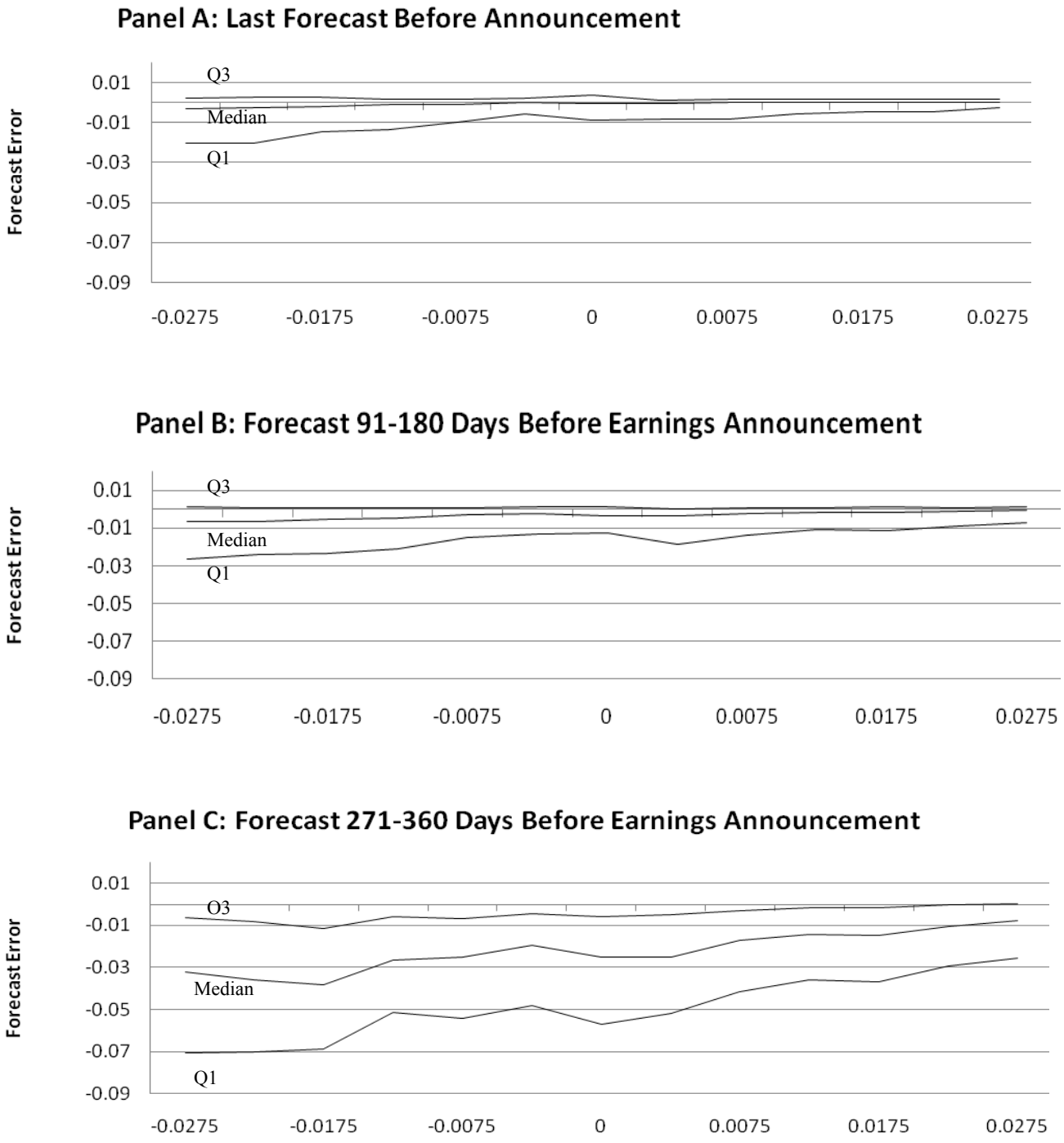


Figure 4. Market Adjusted Returns by Forecast Earnings, Scaled by Market Value

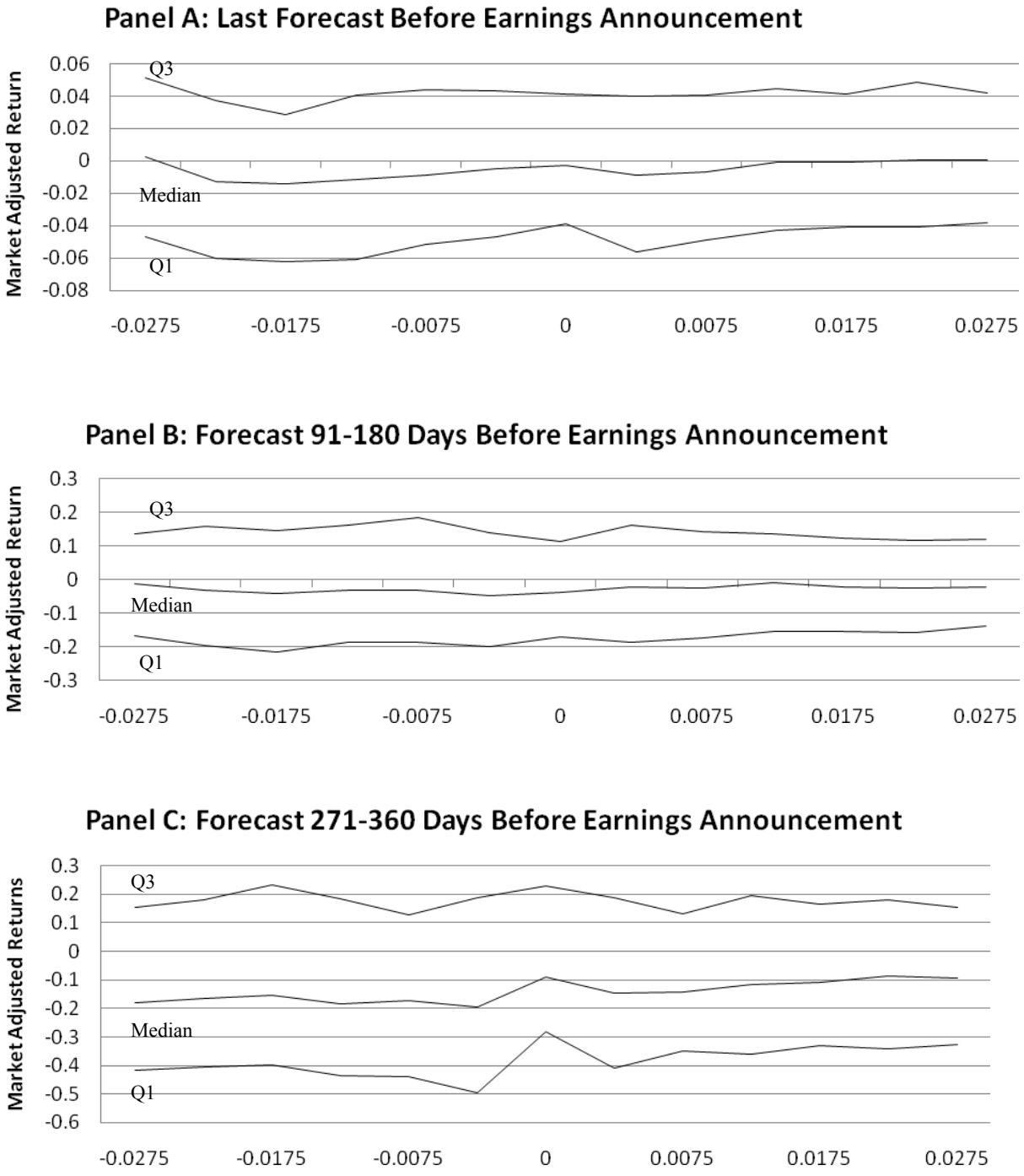


Figure 5. Market Adjusted Returns by Realized Earnings, Scaled by Market Value

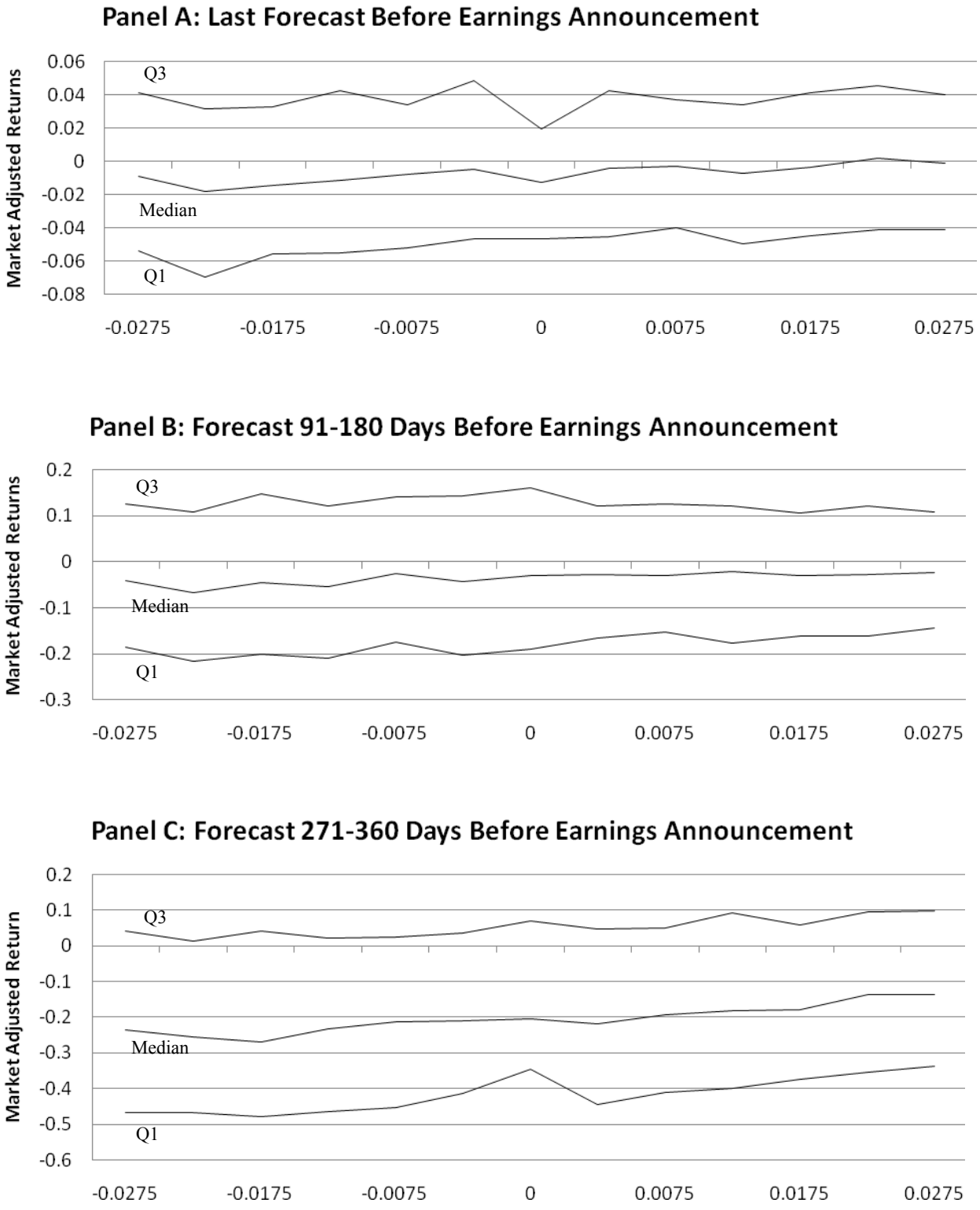


TABLE 1

Sample sizes, distributions by year and industry, and mean and median number of forecasts contributing to forecast medians.

Panel A: Sample Sizes for Various Tests

Forecast Horizons	Distribution Comparisons Forecasts	Distribution Comparisons Actual Earnings	Equation (1)	Equation (2)
Last	21,210	20,700	16,375	16,038
1-90 Days	16,575	16,311	16,300	16,038
91-180 Days	18,564	18,878	14,810	15,196
181-270 Days	17,512	18,925	13,806	15,164
271-360 Days	16,298	18,886	12,638	14,973

Panel B: Sample Distribution by Year for Distribution Comparisons for 1-90 Day Forecast Horizon.

Year	Observations
1983	164
1984	308
1985	307
1986	393
1987	360
1988	329
1989	293
1990	415
1991	413
1992	532
1993	667
1994	717
1995	645
1996	829
1997	1,025
1998	1,171
1999	891
2000	859
2001	982
2002	925
2003	743
2004	846
2005	972
2006	900
2007	889
Total	16,575

TABLE 1 (Continued)

Panel C: Sample Distribution by Industry for Distribution Comparisons for 1-90 Day Forecast Horizon.

Industry	Observations
Agriculture and Natural Resources	35
Mining and Construction	1,261
Manufacturing	2,737
Manufacturing	5,844
Transportation and Communications	192
Wholesale	1,957
Real Estate and other Investment Offices	423
Services and Other	4,126
Total	16,575

Panel D: Mean, Median, and Standard Deviation of the Number of Forecasts per Firm-Year

Forecast Horizon	Mean	Median	Std. Dev.
1-90 Days	6.15	3	7.58
91-180 Days	10.66	7	10.97
181-270 Days	10.39	7	10.69
271-360 Days	10.57	7	11.00

TABLE 2

Quartiles of earnings forecast error by earnings forecast intervals*

Forecast Interval Midpoint	$\hat{E}^{last}_{1,360}$				$\hat{E}^{median}_{91,180}$				$\hat{E}^{median}_{271,360}$			
	n	**Q1**	**Med.**	**Q3**	**n**	**Q1**	**Med.**	**Q3**	**n**	**Q1**	**Med.**	**Q3**
-0.0275	392	-.012	-.001	.004	336	-.019	-.003	.004	252	-.058	-.011	.007
-0.0225	397	-.014	-.001	.003	352	-.018	-.003	.002	238	-.062	-.011	.003
-0.0175	463	-.014	-.001	.003	387	-.020	-.003	.002	229	-.055	-.016	.000
-0.0125	532	-.001	-.001	.003	415	-.021	-.003	.001	273	-.044	-.010	.001
-0.0075	538	-.009	.000	.003	456	-.014	-.002	.001	314	-.037	-.010	.001
-0.0025	566	-.009	.000	.002	479	-.013	-.002	.001	305	-.038	-.010	.002
0.0000	**385**	**-.055**	**-.001**	**.002**	**237**	**-.059**	**-.021**	**.000**	**206**	**-.127**	**-.031**	**.006**
0.0025	706	-.004	.000	.002	633	-.010	-.001	.001	455	-.032	-.007	.001
0.0075	920	-.005	.000	.002	779	-.009	-.001	.001	616	-.030	-.006	.002
0.0125	1095	-.003	.000	.003	930	-.008	-.000	.002	755	-.027	-.004	.003
0.0175	1315	-.003	.000	.003	1098	-.008	-.000	.002	956	-.031	-.005	.003
0.0225	1516	-.003	.000	.003	1288	-.006	-.000	.002	1174	-.020	-.003	.003
0.0275	1726	-.003	.000	.002	1518	-.006	-.000	.001	1381	-.020	-.002	.003

* Earnings and forecasts are from I/B/E/S, and are scaled by beginning of year market value. Forecast error = actual earnings – forecast. Earnings intervals are of width .005, except the for .000 where all earnings equal .000. Earnings forecasts employ the following measures

$\hat{E}^{last}_{1,360}$: last individual analyst forecast issued before the announcement of earnings

$\hat{E}^{median}_{91,180}$: median of forecasts issued from 91-180 days prior to earnings announcement

$\hat{E}^{median}_{271,360}$: median of forecasts issued from 271 and 360 days prior earnings announcement

n = number of observations.
Q1= First quartile forecast error.
Med. = Median forecast error.
Q3= Third quartile forecast error.

TABLE 3

Quartiles of earnings forecast error by earnings intervals*

Earnings Interval Mid Point	$\hat{E}^{last}_{1,360}$				$\hat{E}^{median}_{91,180}$				$\hat{E}^{median}_{271,360}$			
	n	**Q1**	**Med.**	**Q3**	**N**	**Q1**	**Med.**	**Q3**	**n**	**Q1**	**Med.**	**Q3**
-.0275	401	-.020	-.003	.002	354	-.027	-.006	.001	351	-.071	-.032	-.006
-.0225	456	-.020	-.002	.002	385	-.024	-.006	-.001	402	-.070	-.036	-.008
-.0175	481	-.014	-.002	.003	417	-.023	-.005	001	439	-.070	-.038	-.011
-.0125	517	-.013	-.001	.002	460	-.020	-.005	001	467	-.051	-.027	-.006
-.0075	531	-.010	-.001	.002	487	-.015	-.003	.001	474	-.054	-.025	-.007
-.0025	505	-.006	-.000	.002	458	-.013	-.002	.001	460	-.048	-.020	-.004
.0000	**149**	**-.009**	**.000**	**.004**	**127**	**-.012**	**-.003**	**.002**	**126**	**-.057**	**-.025**	**-.006**
.0025	800	-.008	-.000	.001	738	-.019	-.004	.000	710	-.052	-.025	-.005
.0075	952	-.008	.000	.002	853	-.014	-.002	.001	863	-.042	-.017	-.003
.0125	1048	-.006	.000	.002	947	-.011	-.002	.001	935	-.036	-.015	-.002
.0175	1304	-.015	.000	.002	1179	-.011	-.001	.001	1168	-.037	-.015	-.002
.0225	1443	-.005	.000	.002	1309	-.009	-.001	.001	1318	-.029	-.010	-.000
.0275	1656	-.003	.000	.002	1525	-.007	-.001	.001	1512	-.025	-.008	.001

* Earnings and forecasts are from I/B/E/S, and are scaled by beginning of year market value. Forecast error = actual earnings – forecast. Earnings intervals are of width .005, except the for .000 where all earnings equal .000. Earnings forecasts employ the following measures:

$\hat{E}^{last}_{1,360}$: last individual analyst forecast issued before the announcement of earnings

$\hat{E}^{median}_{91,180}$: median of forecasts issued from 91-180 days prior to earnings announcement

$\hat{E}^{median}_{271,360}$: median of forecasts issued from 271 and 360 days prior earnings announcement

n = number of observations.
Q1= First quartile forecast error.
Med. = Median forecast error.
Q3= Third quartile forecast error.

TABLE 4

Quartiles of market adjusted returns by forecast level and forecast horizon*

Forecast Interval Midpoint	$\hat{E}^{last}_{1,360}$				$\hat{E}^{median}_{91,180}$				$\hat{E}^{median}_{271,360}$			
	n	**Q1**	**Med.**	**Q3**	**N**	**Q1**	**Med.**	**Q3**	**n**	**Q1**	**Med.**	**Q3**
-.0275	392	-.047	-.002	.051	336	-.167	-.012	.135	252	-.617	-.181	.154
-.0225	397	-.060	.013	.037	352	-.197	-.032	.158	238	-.404	-.166	.180
-.0175	463	-.062	-.014	.029	387	-.215	-.041	.146	229	-.399	-.155	.234
-.0125	532	-.061	-.012	.041	415	-.186	-.031	.160	273	-.437	-.184	.183
-.0075	538	-.052	-.009	.044	456	-.188	-.033	.184	314	-.438	-.173	.129
-.0025	566	-.047	-.005	.043	479	-.199	-.047	.137	305	-.494	-.194	.186
.0000	**385**	**-.039**	**-.003**	**.041**	**237**	**-.172**	**-.039**	**.113**	**206**	**-.282**	**-.089**	**.227**
.0025	706	-.056	-.009	.040	633	-.186	-.022	.162	455	-.408	-.148	.187
.0075	920	-.049	-.007	.040	779	-.173	-.027	.141	616	-.349	-.144	.131
.0125	1095	-.043	-.001	.044	930	-.156	-.011	.135	755	-.361	-.116	.196
.0175	1315	-.041	-.001	.041	1098	-.153	-.022	.122	956	-.332	-.107	.166
.0225	1516	-.041	.001	.048	1288	-.158	-.026	.116	1174	-.343	-.087	.181
.0275	1726	-.038	.001	.042	1518	-.138	-.023	.119	1381	-.325	-.093	.154

* Market adjusted returns (relative to the CRSP value-weighted index) are from the end of the forecast interval of interest to the day after the earnings release date. For the last forecasts, we begin the returns interval the day before the earnings announcement. Earnings and forecasts are from I/B/E/S , and are scaled by beginning of year market value. Forecast error = actual earnings – forecast. Market value scaled earnings forecast intervals are of width .005, except for .000 where the forecast is .000. Earnings forecasts employ the following measures:

$\hat{E}^{last}_{1,360}$: last individual analyst forecast issued before the announcement of earnings

$\hat{E}^{median}_{91,180}$: median of forecasts issued from 91-180 days prior to earnings announcement

$\hat{E}^{median}_{271,360}$: median of forecasts issued from 271 and 360 days prior earnings announcement

n = number of observations.
Q1= First quartile market adjusted returns .
Med. = Median market adjusted returns.
Q3= Third quartile market adjusted returns.

TABLE 5

Quartiles of market adjusted returns by earnings level and forecast horizon*

Earnings Interval Mid Point	$\hat{E}^{last}_{1,360}$				$\hat{E}^{median}_{91,180}$				$\hat{E}^{median}_{271,360}$			
	n	**Q1**	**Med.**	**Q3**	**N**	**Q1**	**Med.**	**Q3**	**n**	**Q1**	**Med.**	**Q3**
-.0275	401	-.054	-.009	.041	354	-.185	-.040	.126	351	-.466	-.236	.042
-.0225	456	-.069	-.018	.031	385	-.217	-.067	.107	402	-.469	-.254	.012
-.0175	481	-.056	-.014	.033	417	-.201	-.046	.147	439	-.480	-.268	.043
-.0125	517	-.055	-.012	.042	460	-.209	-.054	.122	467	-.463	-.234	.020
-.0075	531	-.052	-.008	.034	487	-.176	-.025	.140	474	-.452	-.211	.023
-.0025	505	-.047	.005	.048	458	-.203	-.043	.143	460	-.415	-.211	.037
.0000	**149**	**-.047**	**-.001**	**.020**	**127**	**-.190**	**-.029**	**.161**	**126**	**-.345**	**-.205**	**.069**
.0025	800	-.045	-.004	.043	738	-.167	-.027	.120	710	-.444	-.220	.046
.0075	952	-.040	-.003	.037	853	-.153	-.031	.125	863	-.410	-.193	.051
.0125	1048	-.050	-.007	.034	947	-.177	-.020	.121	935	-.400	-.181	.091
.0175	1304	-.044	-.004	.041	1179	-.162	-.029	.105	1168	-.375	-.179	.058
.0225	1443	-.041	-.002	.046	1309	-.162	-.027	.120	1318	-.355	-.136	.096
.0275	1656	-.041	-.001	.040	1525	-.143	-.024	.108	1512	-.337	-.137	.099

* Market adjusted returns (relative to the CRSP value-weighted index) are from the end of the forecast interval of interest to the day after the earnings release date. For the last forecasts, we begin the returns interval the day before the earnings announcement. Earnings and forecasts are from the I/B/E/S database, and are scaled by beginning of year market value. Forecast error = actual earnings – forecast. Market value scaled earnings intervals are of width .005, except for .000 where market value scaled earnings is .000. Earnings forecasts employ the following forecasts:

$\hat{E}^{last}_{1,360}$: last individual analyst forecast issued before the announcement of earnings

$\hat{E}^{median}_{91,180}$: median of forecasts issued from 91-180 days prior to earnings announcement

$\hat{E}^{median}_{271,360}$: median of forecasts issued from 271 and 360 days prior earnings announcement

n = number of observations.
Q1= First quartile market adjusted returns.
Med. = Median market adjusted returns.
Q3= Third quartile market adjusted returns.

TABLE 6

Regression of market-adjusted buy and hold returns on forecast error with a zero forecast dummy variable*

Panel A. D1=1 if the earnings forecast is zero, = 0 otherwise.

$$RET = ß_0 + ß_1*FE + ß_2*D1 + ß_3*FE*D1 + ß_4*DLOSS + ß_5*DMBE + ß_6*MB + ß_7*LEV + ß_8*BETA + ß_9*SIZE + ß_{10}*PERSIST + ß_{11}*FE*DLOSS + ß_{12}*FE*DMBE + ß_{13}*FE*MB + ß_{14}*FE*LEV + ß_{15}*FE*BETA + ß_{16}*FE*SIZE + ß_{17}*FE* PERSIST + e \quad (1)$$

Forecast Horizon	Last	1-90 Days	91-180 Days	181-270 Days	271-360 Days
Intercept	-.019***	-.021***	-.095***	-.223***	-.323***
FE	-.030	-.151	.871***	3.587***	6.717***
D1	.009	.010*	.011	-.042	.039
FE*D1	.042	-.007	.132	-1.280	-.694***
DLOSS	-.004*	-.003	.032	.015	-.003
DMBE	.028***	.028***	.084***	.107***	.131***
MB	-.000	.000	.000	.000	.001
LEV	.001	.000	.001	-.002	-.006
BETA	.000	.000	-.002	-.004	-.003
SIZE	.000	.001	-.002	-.003	-.008
PERSIST	.001	.002	.067***	.205***	.343***
FE*DLOSS	.020	.081	-.293	-2.776***	-5.826***
FE*DMBE	.144	.254	.279	.197	.362*
FE*MB	-.001	-.000	.001	.000	.019
FE*LEV	-.025	-.004	-.003	.074	.133
FE*BETA	-.002	.001	-.020	-.057*	.012
FE*SIZE	.005	.011	-.090	-.101**	-.199***
FE*PERSIST	-.082*	-.081	.938**	1.180**	1.473***
Sample Size	16375	16300	14810	13806	12638
R^2	.024	.024	.035	.072	.106

* RET is the market adjusted return (relative to CRSP value-weighted index) in the interval from the end of a forecast interval of interest to the day after the earnings release date,
FE is reported less median forecasted earnings scaled by the market value of equity, for all horizons except last.
DLOSS is 1 if earnings is less than zero, otherwise = 0,
DMBE is 1 if FE is $\geq$ 0, otherwise = 0,
MB is the market to book equity at the end of the year,
LEV is long-term debt divided by the sum of long-term debt plus preferred and common equity,
BETA is market beta based on CRSP equally weighted market portfolio,
SIZE is the natural log of total assets, and
PERSIST is a measure of earnings persistence, based on E/P ratio decile -- 1 for the decile ranking 3 to 8 and 0 for the rankings 1, 2, 9, and 10.
Significance levels are based on clustering errors at the firm and year level and are denoted by *, **, and ***, for 10%, 5%, and 1% respectively (Petersen 2009).

TABLE 6 (continued)

Panel B. D2=1 if the earnings is zero, = 0 otherwise.

$$RET = ß_0 + ß_1*FE + ß_2*D2 + ß_3*FE*D2 + ß_4*DLOSS + ß_5*DMBE + ß_6*MB + ß_7*LEV + ß_8*BETA + ß_9*SIZE + ß_{10}*PERSIST + ß_{11}*FE*DLOSS + ß_{12}*FE*DMBE + ß_{13}*FE*MB + ß_{14}*FE*LEV + ß_{15}*FE*BETA + ß_{16}*FE*SIZE + ß_{17}* FE*PERSIST + e \quad (2)$$

Forecast Horizon	Last	1-90 Days	91-180 Days	181-270 Days	271-360 Days
Intercept	-.026***	-.027***	-.117***	-.292***	-.357***
FE	-.133	-.299***	1.104*	1.273*	4.064***
D2	-.005	-.006	-.020	.069	.384**
FE*D2	-.067	-.068	-.119	-.096	6.085*
DLOSS	-.002	-.002	.044**	.067**	.051
DMBE	.027***	.027***	.088***	.142***	.165***
MB	-.000	-.000	.000	.000	.000
LEV	.000	.000	.002	-.001	-.005
BETA	.001	.000	-.002	-.005	-.005
SIZE	.001**	.001**	-.001	.004	.002
PERSIST	.004**	.005**	.078***	.184***	.259***
FE*DLOSS	.070	.004	.630**	1.138**	-.397
FE*DMBE	.216**	.362***	2.099***	3.668***	3.423***
FE*MB	.000	-.000	.004	.002	.003
FE*LEV	-.023***	-.017**	-.153	-1.083***	-.375
FE*BETA	-.019	-.016	-.150**	-.236**	-.242**
FE*SIZE	.012	.017	-.281***	-.089	-.357***
FE*PERSIST	.138*	.258***	1.622***	1.149**	1.322***
Sample Size	16038	16038	15196	15164	14973
R^2	.025	.025	.045	.081	.099

* RET is the market adjusted return (relative to CRSP value-weighted index) in the interval from the end of a forecast interval of interest to the day after the earnings release date,
FE is reported less median forecasted earnings scaled by the market value of equity, for all horizons except last.
DLOSS is 1 if earnings is less than zero, otherwise = 0,
DMBE is 1 if FE is $\geq$ 0, otherwise = 0,
MB is the market to book equity at the end of the year,
LEV is long-term debt divided by the sum of long-term debt plus preferred and common equity,
BETA is market beta based on CRSP equally weighted market portfolio,
SIZE is the natural log of total assets, and
PERSIST is a measure of earnings persistence, based on E/P ratio decile -- 1 for the decile ranking 3 to 8 and 0 for the rankings 1, 2, 9, and 10.
Significance levels are based on clustering errors at the firm and year level and are denoted by *, **, and ***, for 10%, 5%, and 1% respectively (Petersen 2009).