Benchmark for Earnings Performance: Management Forecasts versus Analysts’ Forecasts

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Benchmark for Earnings Performance: Management

Forecasts versus Analysts’ Forecasts*

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Benchmark for Earnings Performance: Management Forecasts versus Analysts’ Forecasts

Abstract

We investigate the incremental information conveyed by management forecast errors over and above the consensus analyst forecast error at the time of earnings announcement. To the extent that analysts rationally revise their forecasts to subsume information contained in management releases, it is reasonable to argue that management forecasts are “dated” and that the revised analysts’ forecasts would constitute the more timely benchmark to evaluate performance. We find that when management forecasts and the subsequent analyst forecasts are different, management forecast errors convey information to the stock market that is not reflected in the consensus analyst forecast errors.

Keywords: Management forecasts, Analysts’ forecasts, Earnings Response Coefficient

JEL Classifications: G14, G24, G29, M41
1 Introduction

It is well established in the literature that analysts’ forecasts serve as important earnings benchmarks, and that markets evaluate earnings performances of firms against these benchmarks. Consequently, managers have a natural incentive to shape analysts’ expectations in a way that they can achieve these expectations. Indeed, evidence suggests that managers often use their disclosures strategically to guide analysts’ expectations (Libby and Tan, 1999; Cotter, Tuna and Wysocki, 2006; Baik and Jiang, 2006; Li, 2008 and Kross et al., 2010). Although the credibility of such strategic disclosures is always questionable, there is ample evidence that analysts and the market do revise their expectations in response voluntary management forecasts, despite the credibility concerns.

However, it is not clear that analysts will always be guided by management disclosures. It is also possible that managers and analysts disagree, each viewing their own forecasts to be a more accurate reflection of performance expectations, given their private information. Consider the following press release in Financial Times (London, January 11, 2010) on the impact of the Venezuelan devaluation on the earnings of Telefónica, a Spanish telecommunications group:

Analysts suggested that Friday’s devaluation, coupled with accounting adjustments to reflect hyper-inflation, could force Telefónica to lower by 15 percent its earnings per share targets for this year.

However, Telefónica insisted yesterday in a regulatory filing that it stood by its “short and medium term earnings guidance and dividend targets until 2012”. In its latest guidance to analysts, in October, it promised a 2010 dividend of 1.40 euros and annual revenue growth of between 1 and 4 percent until 2012.

1In this study, we use the terms ‘earnings benchmark’ and ‘performance benchmark’ interchangeably to refer to either analysts’ forecasts or management forecasts as candidate proxies for market expectations.

2See Penman (1980); Patell (1976); Hassell, Jennings and Lasser (1988); Waymire (1984); and Ajinkya and Gift (1984).
As another example, consider the following excerpt from an article in the Wall Street Journal about Merck & Co (Wall Street Journal, December 5, 2007):

*Merck said it expects 2008 earnings of $3.96 to $4.06 a share, up from an expected $1.45 to $1.51 a share in 2007. The 2008 forecast includes a pretax charge of $100 million related to a cost-cutting program first announced in 2005....

But analysts said they believed Merck was being conservative in its estimate....

Clearly, if management forecasts are known to be credible and precise (Williams, 1996), such disagreements would be minimal. On the other hand, analysts are information agents themselves. Their expertise and experience make them an independent and a valuable source of information. There is emerging evidence in the finance literature that stock prices contain information not reflected in managers’ earnings forecasts (McNichols, 1989; Chen et al., 2007; and Bakke and Whited, 2008) — analysts presumably bring some of this information to the marketplace. Thus, it is possible that managers and analysts possess different information sets/incentives, and that analysts may disagree with the forecasts issued by managers or vice versa — just as two individual analysts might disagree because of the differences in their beliefs and information sets (as reflected in analyst forecast dispersion, a measure that is commonly used in the literature as a proxy for the heterogeneity in analysts’ beliefs).

The purpose of this paper is to empirically investigate the relative importance that the capital market attaches to analysts’ and management forecasts, especially in instances of disagreement. In addressing this question, it is important to note that analysts have a timing advantage. Under the premise that analysts are rational and efficiently incorporate all information available to them, we would expect them to appropriately update their forecasts following management forecasts. However, if we allow for some disagreements between managers and analysts because of
different information sets, then even assuming that analysts are efficient, the question is: Do the “dated” management forecasts play a role in how the market evaluates firm performance? More importantly, do the management forecasts play a more significant role when managers and analysts appear to disagree? On the other hand, Givoly and Lakonishok (1979), O’Brien (1988), Lys and Sohn (1990), Brown (1991), etc. provide evidence that analysts’ forecasts are not necessarily efficient. Any such inefficiencies would suggest a greater role for management forecasts in shaping the market’s expectations regardless of whether analysts and managers agree; the interesting question is whether the market still attaches greater importance to management forecasts in instances of disagreement.

We define disagreement as having occurred whenever management guidance appears to have failed. For example, consider the case in which the management of a firm believes that the initial forecast issued by an analyst \((AF_1)\) in the quarter is unachievably high, and therefore issues a forecast \((MF)\) to guide the forecast down (i.e., \(MF < AF_1\)). Suppose that the analyst issues a subsequent forecast \((AF_2)\) accordingly \((AF_2 < AF_1)\), we can say that guidance is likely successful (i.e., analysts have been guided down). On the other hand, if the analyst issues a forecast that represents no revision from the earlier forecast, or even an upward revision (i.e., when \(MF < AF_1, AF_2 \geq AF_1\)), we can say that downward guidance is more likely to have failed. We can similarly define disagreement corresponding to a failure of upward guidance.

\(^3\)Note that if the analyst revises his forecast downward, any remaining difference between the revised analyst’s forecast and the management forecast could represent partial agreement; it could also represent full agreement with the difference attributed to the analyst’s forecast being more timely.

\(^4\)It is of course possible that the upward revision in the analyst’s forecast is caused by new information after the management releases its forecast. In this case, we cannot say that management guidance failed. In such instances, management forecasts would indeed be truly dated as benchmarks of firm performance, and we should not expect to find evidence to the contrary. Nevertheless, in our empirical analysis, we check the robustness of our results by refining our definitions of disagreement to incorporate such new information (via stock price movements between \(MF\) and \(AF_2\)).

\(^5\)See the hypotheses development section for a detailed discussion of the construction of \(AF_1, MF\) and \(AF_2\).
disagreements account for around 18% of observations.

We use data on management forecasts and analysts’ forecasts for quarterly earnings from the First Call database for the period 2002-2010 and restrict our attention to a sample of management forecasts for which analysts issue forecasts subsequently.\(^6\) We find that when managers and analysts appear to disagree in their estimates, the association between the three-day size-adjusted cumulative abnormal returns (CAR) and the management forecast error, after controlling for the analyst forecast error, is positive and significant, suggesting the market views management forecasts as a useful benchmark when there is disagreement between management and the analyst community. We do not find any such association when managers and analysts appear to agree in their expectations of future earnings. This result indicates that in cases of agreement, management forecast errors do not appear convey any additional information to the market over and above that conveyed by the consensus analyst forecast error.\(^7\)

Next, we focus on three factors that prior research has identified as affecting the information environment — firm size, growth and analyst forecast dispersion — and test for the incremental information content of management forecast errors over and above the consensus analysts’ forecast errors at the time of earnings announcement, when there is disagreement. Prior research has shown that larger firms have better information environments (for instance, Atiase, 1985; Diamond and Verrecchia, 1991; etc.). Indeed, prior research has shown that disclosure levels are positively

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\(^6\)We are specifically interested in quarterly earnings forecasts that managers issue during a quarter, and not preannouncements. Preannouncements do not represent communication of expectations by managers, because managers have minimal residual uncertainty about actual earnings realizations at the time of preannouncements. In fact, in their analysis of preannouncements, Soffer et al, (2000) require that they be within two months of the end of the fiscal quarter. In contrast, our interest is in examining forecasts that managers make during the period to communicate their imperfect beliefs. We additionally require that there be a subsequent analyst forecast that will presumably incorporate the information contained in the management forecast.

\(^7\)Recall that any analyst inefficiency in incorporating information contained in management forecasts would suggest a greater role for management forecasts in shaping the market’s expectations regardless of whether analysts and managers agree. That this result does not obtain in cases of agreement but does so in cases of disagreement implies that it cannot be attributed to analyst inefficiency.
associated with firm size (Lang and Lundholm, 1993). We argue that managers of larger firms will be more likely to issue credible forecasts due to reputational concerns and that these forecasts will constitute a more useful benchmark to the market, all else equal. Accordingly, we hypothesize and find that the association between the management forecast error and the three-day size-adjusted CAR surrounding the earnings announcement, after controlling for the information contained in the analyst forecast error, is positive and significant in instances of disagreement. We do not find similar results for smaller firms.

Prior research (for example, Skinner and Sloan, 2002) has shown that high-growth firms are severely penalized by the market if they fail to meet earnings expectations. In fact, Skinner and Sloan (2002) find that the asymmetry in the market response to positive versus negative earnings surprises is stronger for high-growth than for low-growth firms. This suggests that managers of high-growth firms could either manage earnings upward (Matsumoto, 2002) or guide analysts’ expectations to beatable levels. If managers choose to guide analysts’ expectations down (Baik and Jiang, 2006), presumably these forecasts will not be very credible. On the other hand, given that low-growth or mature firms do not face such strong market pressures to meet expectations, the quality of their guidance is expected to be better. Thus, we expect that management forecasts of mature firms are more likely to shape the market’s expectations relative to growth firms. We hypothesize and find that the association between the management forecast error and the three-day size-adjusted CAR surrounding the earnings announcement, after controlling for the consensus analyst forecast error, is positive and significant when managers of low growth firms disagree with analysts. We do not find similar results for high growth firms.

Finally, we compare the incremental information content of management forecast errors at the time of earnings announcement for firms with high and low analyst forecast dispersion. High
analyst forecast dispersion indicates that the analyst community is not sure about the future performance of the firm. In such cases, we argue that managers might play a leadership role and convey information to the market through their earnings forecasts. Thus, in instances of disagreement, we expect that the market attaches greater importance to management forecasts for firm with high analyst forecast dispersion relative to firms with low forecast dispersion. Our results are consistent with our prediction.

We perform some sensitivity analysis to test the robustness of our empirical results. First, we note that managers’ decision to issue forecasts may not be exogenous. It is quite possible that only certain types of firms issue management forecasts and our results might be influenced by this endogeneity. Accordingly, we perform a Heckman two stage analysis to control for endogeneity using factors that are determined in the literature to have influenced managers’ propensity to issue forecasts. Our results hold qualitatively. Second, we leave out infrequent forecasters and find that our results continue to hold for the regular forecasters. Finally, we drop observations the year 2008 from our sample in order to eliminate any confounding impact of the Global Financial Crisis. Our results generally hold in these alternate empirical settings thus lending confidence to our empirical findings.

In a related paper, Miller (2006) provides evidence that the market response is stronger when deviations of actual earnings from management earnings pre-announcements are in the same direction as analyst forecast errors. Miller interprets this evidence as being consistent with cue consistency theory (Slovic, 1966). In contrast, and as noted earlier, our focus is not on management preannouncements but on management forecasts that predate prevailing analyst expectations. Thus, either the management forecasts are dated relative to analyst expectations — in which case the market would not view these forecasts as being relevant, or the possibility of disagreements
arises. We are particularly interested in analyzing such disagreements between analysts and managers.

The paper proceeds as follows. We develop our motivation and hypotheses in Section 2, the empirical results are described in Section 3. Section 4 describes some additional tests and section 5 concludes.

2 Motivation and Hypotheses

Extant evidence indicates that the market responds significantly to company-issued guidance and that analysts’ forecast errors decline surrounding such guidance (Hassell, Jennings, and Lasser, 1988). Early studies by Penman (1980), Patell (1976), Nichols and Tsay (1979), and Jaggi (1978) find a positive market response to good news forecasts but no response to bad news forecasts. Waymire (1984) and Ajinkya and Gift (1984) document a significant market response for both good news and bad news forecasts that is consistent with the sign and magnitude of the earnings guidance.

Management forecasts are essentially voluntary disclosures and are subject to strategic behavior. Indeed, there is evidence of optimistic bias in the management forecasts (see, for example, Penman, 1980; Ajinkya and Gift, 1984; Rogers and Stocken, 2005). Thus, whether management forecasts would constitute credible benchmarks of performance has been the subject of many studies. Pownall and Waymire (1989) address this credibility issue and find that the market reaction to the “unexpected” component in management forecasts is very similar in magnitude to the market reaction to the analyst forecast errors at the time of the earnings announcement, suggesting that management forecasts are credible at least to some degree.
Accounting literature has also established analysts’ earnings forecasts as being important earnings benchmarks. Bartov et al. (2002) show that there are rewards to meeting or beating analysts’ expectations. In view of the importance of analysts’ forecasts as benchmarks of performance, recent studies suggest that firms provide guidance in order to meet these forecasts (Baik and Jiang, 2006). Baik and Jiang hypothesize and find an association between the likelihood of providing guidance and factors that proxy for the cost of not meeting forecasts. In particular, high growth firms, firms with high institutional ownership, and firms with a long string of meeting forecasts have a higher tendency to provide guidance. Cotter, Tuna and Wysocki (2006) find that analysts quickly react to management guidance, and that managers often lead analysts to beatable targets.

While rational analysts would revise their expectations following management forecasts to incorporate any new information in these forecasts, it is possible that the information sets analysts use to make their forecasts might differ from the managers’ information sets. Indeed, evidence also indicates that stock prices contain information that is not reflected in managers’ earnings forecasts (McNichols, 1989; Chen et al., 2007; and Bakke and Whited, 2008). Taken together, these studies support the notion that managers and analysts may often possess different information sets.

If managers have strong reasons to believe that their forecasts reflect the true expectations better, they are likely to realize these forecasts, as well as having a proclivity to do so (behaviorally speaking). To the extent that the market is able to discern such instances, it should view management forecasts as the relevant performance benchmark. In equilibrium, managers’ incentives to meet their own forecasts would arguably arise only if the market views their forecasts as a performance benchmark. There is some empirical evidence supporting the existence of such incentives. For instance, Kasznik (1999) hypothesizes and finds that, fearing a loss of reputation and litigation, managers will manage earnings toward meeting their own forecasts, especially when they overstate
their expectations. On the other hand, if analysts were to rationally incorporate all relevant information contained in management forecasts, their (analysts’) revised forecasts would be the more relevant benchmark as they would subsume management forecasts. On the other hand, if analysts are not efficient in processing information as some studies suggest (O’Brien, 1988; Brown 1991), we would expect the market to attach some importance to management forecasts. Thus, whether management forecasts retain their relevance as a performance benchmark (even after analysts revise their estimates in response) is an empirical question.

We illustrate the time line for our study in Figure 1. In Figure 1, the period \( \{T_0, T_1\} \) represents a typical quarter \( t \); \( EA_0 \) AND \( EA_1 \) ARE RESPECTIVELY THE RESPECTIVE QUARTERLY EARNINGS ANNOUNCEMENT DATES. \( MF \) represents the last management forecast for the quarter. \( AF_1 \) represents the last median analysts’ forecast that immediately precedes \( MF \) and \( AF_2 \) is the last median analysts’ forecast for the quarter. In order to identify \( AF_1 \), we first consider only those analysts’ forecasts that are issued prior to management forecasts. Then, for each analyst in the sample, we retain only that forecast that is closest in time to the management forecast. Finally, we compute \( AF_1 \) as the median of these analysts’ forecasts. \( AF_2 \) is similarly calculated by considering all those analysts’ forecasts that are issued after the management forecast and then retaining only the forecast that is closest to the end of the fiscal period for each analyst.

(Insert Figure 1 here)

Accordingly, in this paper we focus on the role of management guidance in shaping the mar-

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8Keeping in mind that a Bayesian update by an analyst that fully subsumes the management forecast need not coincide with the management forecast, a difference in the two forecasts does not necessarily imply that the analyst disagrees with management. Note that in instances where accuracy-oriented analysts know that the managers act to ‘meet’ their own earnings forecasts and have the necessary reporting discretion to do so, it would not be rational for analysts to ‘disagree’ with managers in issuing updated forecasts.

9By defining \( AF_2 \) in this fashion, we are drawing the maximum contrast between \( AF_2 \) and \( MF \) because \( MF \) would be the most dated relative to \( AF_2 \).
ket’s beliefs about the relative importance of management forecasts and analysts’ forecasts as performance benchmarks at the time of earnings announcement. We use the median analysts’ forecasts immediately before the management forecast \((AF_1)\) for establishing a basis for guidance downward or upward. For the purpose of this paper, we adopt the following definitions of downward and upward guidance:10

**Definition of downward guidance:** Downward guidance is likely to have occurred if the last median analysts’ forecast \((AF_2)\) is lower than \(AF_1\), when the management forecast is lower than \(AF_1\).

**Definition of upward guidance:** Upward guidance is likely to have occurred if \(AF_2\) is higher than \(AF_1\) when the management forecast is higher than \(AF_1\).

Figure 2 illustrates these definitions pictorially. As explained in the definitions above, Panels A and B of Figure 2 show that analysts revise their earnings forecast in the same direction as management forecasts, relative to their earlier forecasts when there is guidance.

(Insert Figure 2 here)

By design, we examine analysts’ forecasts that are more timely, i.e., their forecasts are more recent than management forecasts, and therefore have an information advantage. Given a rational analyst, the “dated” management forecast would play a minimal role in shaping the market’s expectations, unless managers and analysts appear to disagree because their forecasts are based on different information sets. However, extant evidence suggests that analysts’ forecasts are not efficient (O’Brien, 1988; Brown, 1991), which raises the possibility that the market’s expectations would be shaped to some extent by management forecasts.11

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10In our analyses, we take agreement and disagreement with guidance as a whole, rather than analyze agreements or disagreements with upward and downward guidance separately.

11As we have argued earlier, if analysts are inefficient, however, analyst inefficiency per se should not cause expect any systematic differences in the incremental information contained in the management forecast errors between the “agreement” and the “disagreement” samples.
When management guidance fails in that analysts do not respond in the way that managers want them to, it may be that analysts simply disagree, or that any new performance relevant information subsequent to the issuance of the management forecast causes the revised analyst forecast to move in a way that would appear to counter management guidance. These latter instances do not constitute disagreements between managers and analysts. They would merely render management forecasts as being more dated. We note that while we classify such instances as disagreement, they bias our tests against finding support to the hypotheses that we present below.

To the extent that managers possess valuable private information about their own firms, it is possible that the market will regard management forecasts as a relevant performance benchmark, despite credibility concerns associated with voluntary management forecasts. On the other hand, and as noted above, analysts are information agents often bringing new information to the marketplace. Thus, whether the market would regard management forecasts as a relevant benchmark at the time of earnings announcement — when analysts refuse guidance — is a question that can only be addressed through empirical examination. Accordingly, we test the following hypothesis corresponding to cases where analysts disagree with guidance.¹²

**Hypothesis H1** Management forecast errors convey value relevant information, incremental to the last consensus analyst forecast error, when analysts appear to disagree with management guidance.

We test H1 in two ways. Our first set of tests considers the partial correlation between the management forecast error and the three day size-adjusted cumulative abnormal returns (CAR) surrounding the earnings announcement, conditional on the last consensus analyst forecast error. We use this partial correlation measure because it partial correlation captures the extent to which

¹² All hypotheses have been stated in the alternate form.
the management forecast error and CAR are associated, after removing the effects of the analyst forecast error from both these variables. For H1, we expect that the partial correlation between the management forecast error and the three day size-adjusted CAR will be positive.

We also test H1 in a regression framework. Specifically, we first regress the management forecast error on the last consensus analyst forecast error. The predicted value from this model ($Pred_{it}$), captures the extent of the information in management forecast error that is reflected in the last consensus analyst forecast error and the residual ($Resid_{it}$) captures the incremental information content of the management forecast error. We then use $Pred_{it}$ and $Resid_{it}$ in our empirical model as follows:\(^{13}\)

$$CAR_{it} = \alpha_0 + \alpha_1 Pred_{it} + \beta_1 Resid_{it} + \sum_{j} \gamma_j * X_{jit} + \epsilon_{it}$$  (1)

Prior literature, for example, Kormendi and Lipe (1987), Collins and Kothari (1989), Easton and Zmijewski (1989), has identified some important determinants of earnings response coefficients. Based on this literature, we include the following determinants as our block of control variables in equation (1) above, $X_{jit}$, in our model — growth (the closing market-to-book ratio for the quarter), leverage (long-term debt divided by the sum of long-term debt, preferred stockholders’ equity, and common shareholders’ equity), size (the natural logarithm of total assets), and a measure for permanence, as calculated in Ali and Zarowin (1992).\(^{14}\)

\(^{13}\)Alternatively, we can perform this estimation in single stage by using the management forecast error and the analyst forecast error as independent variables in equation (1). We use this two stage approach for interpretational convenience.

\(^{14}\)The measure of permanence is calculated as in Ali and Zarowin (1992) by ranking firms each quarter by their $E_{it}/P_{it}$ ratios, where $E_{it}$ is the reported earnings per share for quarter $t$ and $P_{it}$ is the price at the end of the quarter. All firms with negative values of $E_{it}/P_{it}$ are assigned a ranking of 1 and the remaining observations are grouped into approximately equal portfolios and ranked 2 through 10. The earnings persistence variable is set equal to 1 if the observation’s ranking is from 3 to 8; otherwise it is set equal to 0.
The coefficient of interest in the above model is the slope coefficient, \( \hat{\beta}_1 \), which captures the market’s response to the incremental information content in the management forecast error, over and above the last consensus analyst forecast error. H1 predicts that this coefficient will be more positive for the sample for which analysts disagree with management guidance. Empirical support for H1 would lend credence to the conjecture that management forecasts are viewed as relevant despite being dated. Results that support H1 would add to the body of research (for instance, Schipper, 1991, Francis and Philbrick, 1993) that argues that investors do not solely rely on analysts’ forecasts in forming their earnings expectations.

We next test whether the information content of management forecast error, at the time of earnings announcement, depends on the extent of information asymmetry between the manager and the market. Specifically, we consider three factors that could potentially affect the information environment. These factors are firm size (as measured by the natural logarithm of total assets), growth (as measured by the closing quarterly market-to-book ratio) and analyst forecast dispersion (as measured by the standard deviation of the last individual analyst forecasts for the quarter).

Much prior research, for instance, Atiase (1985), Bamber (1987), Diamond and Verrechhia (1991), etc. argues that there is a negative association between size and information asymmetry. In other words, the information environment is likely to be better for larger firms. Prior research (for example, Cox, 1985, Waymire, 1985, Lev and Penman, 1990; Lang and Lundholm, 1993; etc.) also suggests that voluntary disclosures are increasing in firm size because the cost of disclosure is lower and incentives for information gathering are higher (King, Pownall and Waymire, 1990) for larger firms. Larger firms are also under intense public scrutiny from the analyst and investment community (Bhushan, 1989). They face strong litigation concerns if their disclosures are deemed to misleading (Skinner, 1994). Thus, we would expect management forecasts issued by larger
firms to be highly credible. Moreover, given lower levels of information asymmetry for larger firms, we would also expect that there would be less disagreement between analysts and managers regarding expectations about future performance. But, in the event that such disagreements do occur, it is reasonable to posit that management forecasts may be based on superior information that managers likely possess. Therefore, the hypothesis that management forecast errors convey incremental information content for larger firms at the time of the earnings announcement speaks directly to the credibility of their forecasts. Accordingly, we test the following hypothesis.

**Hypothesis H2** The incremental information content of the management forecast error over the consensus analyst forecast error is higher for larger firms in cases where analysts appear to disagree with management guidance.

Growth firms face severe market penalties if they fail to meet market expectations (Skinner and Sloan, 2002). Therefore, it is likely that managers of growth firms would be more likely to issue guidance to walk analysts down to beatable targets (Baik and Jiang, 2006) and/or engage in earnings management to meet market expectations (Kasznik, 1999, Matsumoto, 2002). If earnings management is more rampant in growth firms, it is likely that the market will discount forecasts issued by these firms. On the other hand, low growth or mature firms are more likely to have a stable earnings history. Mature firms are also likely to have strong reputation incentives for making credible disclosures. Thus, we expect that the management forecasts of mature (low growth) firms will have greater incremental information content relative to high growth firms. Accordingly, we test the following hypothesis.

**Hypothesis H3** The incremental information content of the management forecast error over the last consensus analyst forecast error is higher for low growth firms in cases where analysts appear
to disagree with management guidance.

We next focus on analyst forecast dispersion. High levels of forecast dispersion among analysts reflect disagreement in the analyst community on the projected financial performance of the firm, as prior research suggests (for instance, Brown, Richardson and Schwager, 1987; Barron, Kim, Lim and Stevens, 1998; Wiedman, 1996; etc.). One could argue that management forecasts play an important role in improving the information environment when there is much disagreement within the analyst community. Prior literature has examined the impact of management forecasts on aspects of the firm’s capital market environment. For example, in a recent study, Kothari, Li and Short (2009) show that disclosures that decrease uncertainty reduce analyst forecast dispersion. Similarly, Baginski, Conrad and Hassell (1993) and Clement, Frankel and Miller (2003) show that management guidance reduces analyst forecast dispersion. Based on this literature, we argue that in the event that analysts disagree with management guidance when there is much disagreement within the analyst community, the incremental information content in the management forecast error is likely to be higher. We state this hypothesis below.

**Hypothesis H4** The incremental information content of the management forecast error over the last consensus analyst forecast error is higher in cases where analysts appear to disagree with management guidance, when analyst forecast dispersion is high.

We test Hypotheses 2-4 in the same manner as Hypothesis 1. We first divide our sample into two groups by the level of the variable of interest (size in H2, growth in H3 and analyst forecast dispersion in H4). Then we estimate the partial correlations between the three-day CAR and management forecast error (conditional on the analyst forecast error) and compare across the

\[15\] In order to eliminate the possibility that a high standard deviation of quarterly forecasts reflects analysts revising their forecasts, we only consider the standard deviation of the last individual analyst forecast for the quarter as our measure of analyst forecast dispersion.
two groups. We estimate a modified version of equation (1) to make inter-group comparisons.

3 Data

We obtain data on management forecasts, analysts’ forecasts and actual earnings from the quarterly company issued guidelines, estimates and actuals datasets on Thomson Financial’s First Call database, stock returns data from the Center for Research in Security Prices (CRSP) daily stock returns database and financial statements data from the Compustat North America Industrial Quarterly database. We conduct our empirical analyses over the eight year period, 2002-2010. We start from 2002 for two reasons. First, starting our analysis in 2002 helps us eliminate any effect that the Regulation Fair Disclosure may have had on the information environment. Second, the management forecast data is sparse in periods before 2002.

(Insert Table 1 here)

Panel A of Table 1 shows our sample selection criteria. We start with an initial sample based on data availability in Compustat, CRSP and First Call. We exclude earnings pre-announcements because these come fairly close to or after the end of the fiscal period and are typically a preview of the actual earnings. For each quarter, we consider the management forecast that is closest to (but before) the earnings announcement (hereafter, the last management forecast) but is not a pre-announcement.

For this sample, we retain the median analyst forecast closest to (but before) the earnings announcement for each quarter (hereafter, the last analyst’s forecast) because we assume that it

\footnote{We have also checked the robustness of our results by estimating our empirical model for the 15 year period from 1995-2010. Results hold qualitatively. These results have not been shown in the paper, but are available upon request.}
represents the market’s expectations close to the time of earnings announcement. We also retain
the median analyst’s forecast that is closest to, but before, the management forecast. Finally, we
delete significant outliers in management forecasts, median analysts’ forecasts, earnings per share,
and the control variables. Our final sample thus consists of 13,337 firm-quarter observations
(1,934 firms) with non-missing values for key variables.

(Insert Table 2 here)

Table 2 presents some descriptive statistics for our data. Panel A presents statistics for the full
sample consisting of 13,337 observations. The mean (median) three day market-adjusted cumula-
tive abnormal return surrounding earnings announcement for the sample is 1.14% (1.11%).

The mean (median) absolute management forecast error and analyst forecast error are respec-
tively $0.09 ($0.04) and $0.04 ($0.02). The mean signed management forecast error of −$0.01
reflects some degree of managerial optimism, which is consistent with prior evidence in the litera-
ture. Interestingly, the positive to negative ratio for management forecast errors is 1.92, suggesting
that management forecasts are beaten more often that not in our sample. The positive to negative
ratio for analysts’ forecast errors is 3.98. Thus, actual earnings are higher than analysts’ forecasts
more often for the sample, consistent with prior literature.

Panel B of Table 2 presents statistics for the subsample for which analysts disagree with guid-
ance. This sample is roughly 17.86% of the total sample (2,382 firm-quarter observations). Inter-
estingly, for this sample, we see that the mean management forecast error is negative (−$0.06).
This suggests that when managers and analysts disagree over guidance, the firm fails to meet
its own management forecasts, on average. A closer look at the data, however, reveals that the

\[17\] We exclude the top and bottom 1% of the observations for these key variables.
mean negative management forecast error is driven primarily by cases where analysts disagree with upward guidance (when analysts disagree with upward guidance, the mean (median) management forecast error is -$0.20 (-$0.16)).\textsuperscript{18} The mean (median) management forecast error is $0.08 ($0.04) when analysts refuse downward guidance.\textsuperscript{19} We see that the mean (median) absolute management forecast error and analyst forecast error for the disagreement sample are respectively $0.15 ($0.08) and $0.04 ($0.02), suggesting that analysts’ forecasts are more accurate, relative to the management forecast, for the downward disagreement sample. We hasten to add, however, that the relative inaccuracy of management forecasts does not necessarily mean that management forecast errors are devoid any information content.

In Panel C, we present statistics for the agreement sample. This sample is approximately 82% of the full sample (10,955 firm-quarter observations). We find that the mean (median) absolute management forecast error and analyst forecast error for this sample are $0.08 ($0.03) and $0.04 ($0.02). The mean signed forecast errors suggest that both management forecasts and analysts’ forecasts are met on average for the agreement sample.

We present the results of our empirical analyses next.

\textsuperscript{18}In fact, when analysts disagree with upward guidance, the positive to negative ratio of the management forecast errors is only 0.07.

\textsuperscript{19}The positive to negative ratio of the management forecast error is 14.20 when analysts disagree with downward guidance.
4 Results

4.1 Main results

Recall that in Hypothesis 1 (H1), we test whether management forecast errors provide value relevant information, incremental to the last consensus analysts’ forecast errors, when there is disagreement between managers and analysts, at the time of earnings announcement. We first test H1 by examining the partial correlation between the management forecast error and the three day size-adjusted CAR around the earnings announcement, conditioning on the consensus analyst forecast error. These partial correlations are presented in Panel A of Table 3.

(Insert Table 3 here)

As we can see from Column 1, the partial correlation coefficient is statistically significant (coefficient=0.047 p-value=0.023), suggesting that when managers and analysts disagree with guidance, the management forecast error conveys incremental information to the market, over and above that conveyed by the consensus analyst forecast error. This univariate analysis provides preliminary support for H1. In contrast, Column 2 indicates that the partial correlation for the agreement sample is not statistically different from zero. Thus, when analysts appear to agree with the management guidance, we cannot reject the null that the management forecast error does not convey any incremental information relative to the analyst forecast error at the time of the earnings announcement. Overall, the results from Panel A of Table 3 are consistent with the predictions of H1.

We also test H1 in a regression framework by estimating equation (1), which enables us to control for other known determinants of market response to earnings announcements. In particular,
we first regress the management forecast error on the consensus analysts’ forecast error and obtain the predicted value \((\text{Pred}_{it})\) and residual \((\text{Resid}_{it})\). We then regress the 3-day size-adjusted CAR on \(\text{Pred}_{it}\) and \(\text{Resid}_{it}\) and the control variables.\(^{20}\) Panel B of Table 3 presents the results from this estimation.

The coefficient of interest, \(\hat{\beta}_1\), captures the incremental information content in the management forecast error over and above the consensus analyst forecast error, at the time of the earnings announcement. H1 predicts \(\hat{\beta}_1\) to be more positive for the disagreement sample. Column 1 of Panel B presents the estimation results for the disagreement sample. The coefficient \(\hat{\beta}_1\) is positive and statistically significant at 5\% (coefficient=0.281, p-value=0.050), suggesting that management forecast errors convey incremental information to the market, over and above the analyst forecast error, when analysts refuse guidance. In contrast, when analysts agree with management guidance, we cannot reject the null that \(\hat{\beta}_1\) is zero for the agreement sample (Column 2 of Panel B). When we compare the estimated coefficient, \(\hat{\beta}_1\), for the two samples, we see that the coefficient is statistically higher for the disagreement sample (p-value < 0.001).

Note also that if analysts’ forecasts were inefficient in incorporating the information contained in management forecasts, we would have expected the market to attach some importance to management forecasts as a performance benchmark. Accordingly, we would have expected \(\hat{\beta}_1\) to be positive for the agreement sample as well, which is not what we find. Thus, we are unable to reject the null that analysts fully incorporate the information contained in management forecasts, for the agreement sample. Thus, given this inference, the positive \(\hat{\beta}_1\) that we document for the disagreement sample is attributable more to disagreements between managers and analysts than to analyst

\(^{20}\)We do not report the first stage equation results in the table for the sake of brevity. The results are available upon request.
inefficiency.

The coefficients on the control variables are generally consistent with prior studies. For instance, the coefficient on size is positive and significant for the agreement sample (coefficient = 0.017, p-value = 0.10), the coefficient on growth is positive and significant for both samples (coefficient = 0.056, p-value < 0.01 in Column 1 and coefficient=0.076, p-value < 0.01 in Column 2), and the coefficient on leverage is negative and significant for both samples (coefficient=-0.195, p-value = 0.10 in Column 1 and coefficient = -0.166, p-value < 0.01 in Column 2). Overall, the results from Panel B confirm the univariate results from Panel A in offering support to H1.

**Firm size effect**

H2 tests how firm size impacts the relevance of management forecast errors at the time of earnings announcement. This hypothesis is based on the notion that large firms face intense public scrutiny and have an inherent incentive to issue credible forecasts. Consequently, if analysts appear to refuse management guidance offered by larger firms, it is more likely that their (management) forecasts are likely shape market expectations to a greater extent relative to the forecasts of smaller firms. Accordingly, H2 predicts that the management forecast errors of larger firms will have incremental information content (relative to smaller firms) at the time of earnings announcement, in instances of disagreement. As with H1, we test H2 by first examining the partial correlation of the management forecast error with the 3-day size-adjusted CAR and then by regression analysis.

(Insert Table 4 here)

Panel A of Table 4 presents the partial correlations for the four subsamples – disagreements re small firms (Column 1), agreements re small firms (Column 2), disagreements re large firms
Panel A shows that the partial correlation is only significant in Column 3 (coefficient = 0.069, p-value < 0.05), and suggests that the market views management forecast errors as conveying additional information about firm performance only in the case of disagreements re large firms. This result provides preliminary empirical support for H2.

Referring to the regression results in Panel B of Table 4, notice that the coefficient of interest, $\hat{\beta}_1$, is positive and statistically significant (coefficient=0.312, p-value < 0.01) for the large disagreement sample only (Column 3). Taken together, these results provide strong support to H2.

**Firm growth effect**

H3 tests how firm growth impacts the significance of the management forecast at the time of earnings announcement. This hypothesis again is based on the premise that forecasts issued by mature firms are more credible than those issued by high growth firms. Accordingly, H3 predicts that the management forecast errors of low growth firms will have incremental information content at the time of earnings announcement, in instances of disagreement. Panel A of Table 5 presents the partial correlations between the management forecast error and the 3-day size-adjusted CAR for agreement and disagreement samples with respect to both mature and high growth firms.\(^{22}\)

(Insert Table 5 here)

As Panel A indicates, the partial correlation between the management forecast error and the 3-day size-adjusted CAR is only significant in Column 1 (coefficient = 0.063, p-value < 0.05). Panel

\(^{21}\)Recall that a firm is classified as small (large) if the natural logarithm of its total assets lies above the cross-sectional median.

\(^{22}\)Recall that low and high are defined as the market-to-book ratio lying below or above the median of the distribution respectively.
A thus suggests that the market considers the management forecast errors of low growth firms to be conveying additional information about firm performance at the time of earnings announcement, when there is disagreement between managers and analysts. The result thus provides preliminary empirical support for H3. Referring to the regression results in Panel B of Table 5, we can see that the coefficient, $\hat{\beta}_1$ is positive and statistically significant (coefficient = 0.358, p-value < 0.05) only for the disagreement sample re low growth/mature (Column 1). Overall, these results are consistent with H3.

**Analyst dispersion effect**

H4 predicts that management forecast errors of high dispersion firms will have incremental information content at the time of earnings announcement in instances of disagreement, relative to low dispersion firms. As we have discussed earlier, management forecasts become more relevant as a benchmark to assess firm performance when there is greater disagreement within analysts as captured by the dispersion in their forecasts. Referring to Panel A of Table 6, the partial correlation between the management forecast error and the 3-day size adjusted CAR is only significant in Column 3 (coefficient = 0.068, p-value < 0.05), lending support to this hypothesis.

(Insert Table 6 here)

The regression results in Panel B of Table 6 indicate that the estimated coefficient, $\hat{\beta}_1$ is positive and statistically significant (coefficient = 0.328, p-value < 0.05) for the high disagreement sample only (Column 3), again confirming support for H4.
5 Additional tests

In order to examine the robustness of our main results, we perform some additional empirical tests. We recognize that the decision to issue a management forecast is not exogenous. Only certain types of firms issue management forecasts. Hence, we examine the impact of this endogeneity on our results. We also replicate our studies by eliminating infrequent forecasters from our sample. Finally, we drop observations from the year 2008 in order to eliminate any confounding effect of the Global Financial Crisis. The results from these analyses are described below.

5.1 Endogeneity of management forecasts

In the tests presented above, we have taken management forecasts as given. However, it must be recognized that managers face a choice in issuing forecasts. All firms do not issue forecasts. In order to examine the impact of any consequent bias and its possible effects on our empirical results, we control for the endogeneity of management forecasts by conducting a two-stage Heckman procedure.

In the first stage Probit, we consider some variables identified in the literature as potentially affecting the manager’s decision to issue the forecast; variables such as analyst following, analysts’ forecast dispersion, a dummy variable indicating whether there was a management forecast in the previous quarter and a dummy variable indicating whether or not there is bad news (as captured by negative EPS). For instance, Healy and Palepu (2001) observe that managers issue forecasts to reduce information asymmetry (analysts’ forecast dispersion) and to get increased analyst coverage (analyst following). We also know from prior studies that there is a negative stock price reaction when firms stop issuing forecasts (Chen et. al., 2006). Hence, the likelihood of a manager issuing
a forecast in a given quarter will be higher conditional on there being a management forecast in the previous quarter. Finally, following Skinner (1994), we include a bad news dummy as an independent variable in the first stage.

Untabulated results show that the first stage probit performs well in explanatory power, indicating that we have a reasonable model of self-selection. When we include the Inverse Mills Ratio from this Probit estimation as an independent variable in estimating equation (1) in the second stage, we find that all our results still hold strongly. Thus our empirical results are robust to the self-selection problem.

5.2 Removing infrequent forecasters

Managers could strategically issue forecasts infrequently to guide analysts with specific objectives in mind. For example, Lang and Lundholm (2010) show that managers of firms increase the level of discretionary disclosure around seasoned equity offerings (SEO) and that firms that increase their disclosure activity significantly experience price rises leading up to the SEO, but experience price declines after the offering. In another study, Brennan (1999) shows that disclosure activity is more likely during contested bids and that target firms were more likely to issue profit forecasts in such disclosures. These studies clearly demonstrate how managers can use disclosures as strategic tools under special situations. Thus, we remove these infrequent forecasters from our sample and replicate our results on the sample of frequent forecasters. We have defined frequent forecasters in two different ways – those firms that have issued management forecasts in more than 15 times in our sample period and those that disclose more often than the median number of disclosures per firm. Our results are robust to the exclusion of "chance" forecasters.
5.3 Removing the effect of the Global Financial Crisis

Our sample overlaps with the Global Financial Crisis (GFC) in part. It is possible that the GFC significantly influenced the nature of management forecasts. Baginski, Hassell and Hillison (2000) and Baginski, Hassell and Kimbrough (2004) report that when managers convey bad news through their earnings forecasts, they are more likely to attribute this to external factors beyond their control. Baginski et al. (2004) also show that such attributions in disclosure cause stock price reactions. We argue that a significant volume of management forecasts issued during the GFC could convey bad news attributable to the larger macroeconomic conditions. Thus, in our final set of robustness checks, we have eliminated observations from 2008 from our final sample to remove the effect of the GFC. We find that removing 2008 from our sample does not alter the nature of the results.

6 Conclusion

In this study we examine the incremental information conveyed by management forecast errors, over and above that conveyed by analysts’ forecast errors, at the time of earnings announcement. Our research is motivated from prior literature that suggests that analysts revise their expectations following management forecasts and that the extent of forecast revision is a function of the accuracy of management forecasts. We first observe that despite analysts revising their earnings forecasts following voluntary disclosure by managers, the revised analysts’ forecasts often differ significantly from management forecasts, leaving the relevance of the two earnings forecasts at the time of earnings announcements an open question.

Thus we investigate whether the management forecast error conveys any meaningful informa-
tion to the market at the time of earnings announcement when managers and analysts disagree. Our results suggest that this is indeed so. In other words, we find a positive association between the 3-day size-adjusted CAR and the management forecast error when managers and analysts disagree over guidance, controlling for the last consensus analyst forecast error. We find no evidence of a statistically significant association when guidance is successful.

We next focus on three factors that affect a firm’s information environment — firm size, firm growth and analyst forecast dispersion. We argue that larger firms are more likely to make more credible voluntary disclosures. As a result, we expect the information content of management forecast errors of larger firms to be high at the time of earnings announcement, in instances of disagreement. We find empirical support for our hypothesis. We also argue that management forecast errors of low growth (mature) firms are more credible than those of high growth firms and expect that management forecasts made by low growth firms will have high information content at the time of earnings announcement. Our results support our prediction. Finally, we argue that when the analyst community has much disagreement about future firm performance, managers can play the leadership role and offer some earnings guidance. Thus we argue that when analysts’ forecast dispersion is high and analysts disagree with management guidance, the management forecast error will convey valuable information about firm performance to the market. Our results are consistent with this hypothesis.

In sum, our study takes a step in advancing our understanding of the relative (perceived) importance of management forecasts in shaping market expectations. One fruitful avenue to pursue is to study the relative information contents of the two benchmarks in specific research settings in which there is reason to believe that information sets of managers and analysts are more likely to be different (for instance, post-major restructuring, mergers and acquisitions or IPOs).
specific research settings are interesting because they could create different disclosure incentives for managers. For example, in a merger and acquisition, the manager of the target firm could have strong incentives to make his firm look good, in order to ward off the potential acquisition. While these incentives provide interesting research settings, to the extent that such cases are there in our existing sample, they could influence our reported results. While this is a limitation of our study, the descriptive statistics presented in the paper do not suggest that observations relating to these cases are a significant number in our sample.
References


Barron, O., O. Kim, S. Lim, and D. Stevens (1998). Using analysts’ forecasts to measure prop-


Wiedman, C. (1996). The relevance of characteristics of the information environment in the

Tables And Figures

Figure 1: Timeline

| T₀ | EA₀ | AF₁ | MF | AF₂ | T₁ | EA₁ |

The events are described as under:

- **T₀**: End of quarter \((t-1)\).
- **EA₀**: Earnings announcement date for quarter \((t-1)\).
- **AF₁**: The median analysts’ forecast that immediately precedes the last management forecast for the quarter \(t\).
- **MF**: The last management forecast for quarter \(t\).
- **AF₂**: The last median analysts’ forecast for the quarter \(t\).
- **T₁**: End of quarter \(t\).
- **EA₁**: Earnings announcement date for quarter \(t\).
Figure 2: Guidance

Panel A: Guidance Downward

AF₁ \rightarrow \text{Direction of AF₂ revision} \rightarrow \text{MF}

Panel B: Guidance Upward

\text{MF} \rightarrow \text{Direction of AF₂ revision} \rightarrow \text{AF₁}

The events are described as under:

- **AF₁**: The median analysts’ forecast that immediately precedes the last management forecast for the quarter \(t\).
- **MF**: The last management forecast for quarter \(t\).
- **AF₂**: The last median analysts’ forecast for the quarter \(t\).
### Table 1: Sample Selection

#### Panel A: Sample Selection Criteria

<table>
<thead>
<tr>
<th></th>
<th>Firms</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Sample in the intersection of Compustat, CRSP and First Call, after removing earnings pre-announcements</td>
<td>2,128</td>
<td>16,117</td>
</tr>
<tr>
<td>Less:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing values for key variables</td>
<td>(171)</td>
<td>(2,078)</td>
</tr>
<tr>
<td>Outliers with respect to management forecasts, analysts' forecasts, cumulative abnormal returns and control variables</td>
<td>(23)</td>
<td>(702)</td>
</tr>
<tr>
<td>Final Sample</td>
<td>1,934</td>
<td>13,337</td>
</tr>
</tbody>
</table>

The initial sample in the above Table is based on the intersection of observations drawn from the Compustat North America Fundamentals Quarterly, the Center for Research in Security Prices (CRSP) daily stock returns, Thomson Reuter’s First Call Company Issued Guidance, Actuals and Details data files. The sample covers the period from 2002-2010. The initial sample has been constructed by merging the above-mentioned data and retaining the last management forecast for the quarter, but before the end of the fiscal period, the last individual analyst forecast that immediately precedes the management forecast and the last individual analyst forecast for the quarter.
Table 2: Descriptive Statistics

**Panel A: Full Sample**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev</th>
<th>Median</th>
<th>10th Pctl</th>
<th>90th Pctl</th>
<th>Pos./Neg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UE^M</td>
<td>13,337</td>
<td>0.09</td>
<td>0.14</td>
<td>0.04</td>
<td>0.01</td>
<td>0.22</td>
<td>1.92</td>
</tr>
<tr>
<td>UE^A</td>
<td>13,337</td>
<td>0.04</td>
<td>0.07</td>
<td>0.02</td>
<td>0.00</td>
<td>0.08</td>
<td>3.98</td>
</tr>
<tr>
<td>CAR</td>
<td>13,337</td>
<td>1.14</td>
<td>1.42</td>
<td>1.11</td>
<td>-0.67</td>
<td>2.99</td>
<td>3.86</td>
</tr>
<tr>
<td>Size</td>
<td>13,337</td>
<td>7.10</td>
<td>1.62</td>
<td>6.94</td>
<td>5.11</td>
<td>9.33</td>
<td></td>
</tr>
<tr>
<td>MVE</td>
<td>13,337</td>
<td>6,592.88</td>
<td>23,633.4</td>
<td>1,316.97</td>
<td>220.05</td>
<td>12,658.5</td>
<td></td>
</tr>
<tr>
<td>Sales</td>
<td>13,337</td>
<td>1,254.79</td>
<td>4,881.6</td>
<td>251.72</td>
<td>32.61</td>
<td>26,731.5</td>
<td></td>
</tr>
<tr>
<td>Lev</td>
<td>13,337</td>
<td>0.23</td>
<td>0.35</td>
<td>0.11</td>
<td>0.00</td>
<td>0.60</td>
<td></td>
</tr>
</tbody>
</table>

**Panel B: Disagreement Sample**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev</th>
<th>Median</th>
<th>10th Pctl</th>
<th>90th Pctl</th>
</tr>
</thead>
<tbody>
<tr>
<td>UE^M</td>
<td>2,382</td>
<td>0.15</td>
<td>0.20</td>
<td>0.08</td>
<td>0.01</td>
<td>0.38</td>
</tr>
<tr>
<td>UE^A</td>
<td>2,382</td>
<td>0.04</td>
<td>0.07</td>
<td>0.02</td>
<td>0.00</td>
<td>0.08</td>
</tr>
<tr>
<td>CAR</td>
<td>2,382</td>
<td>1.16</td>
<td>1.39</td>
<td>1.14</td>
<td>-0.55</td>
<td>2.93</td>
</tr>
<tr>
<td>Size</td>
<td>2,382</td>
<td>7.24</td>
<td>1.59</td>
<td>7.07</td>
<td>5.27</td>
<td>9.44</td>
</tr>
<tr>
<td>MVE</td>
<td>2,382</td>
<td>7,367.91</td>
<td>24,745.6</td>
<td>1,663.60</td>
<td>274.80</td>
<td>14,781.30</td>
</tr>
<tr>
<td>Sales</td>
<td>2,382</td>
<td>1,400.23</td>
<td>5,064.64</td>
<td>316.26</td>
<td>44.740</td>
<td>3,076.00</td>
</tr>
<tr>
<td>Lev</td>
<td>2,382</td>
<td>0.21</td>
<td>0.30</td>
<td>0.11</td>
<td>0.00</td>
<td>0.55</td>
</tr>
</tbody>
</table>
Panel C: Agreement Sample

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev</th>
<th>Median</th>
<th>10th Pctl</th>
<th>90th Pctl</th>
</tr>
</thead>
<tbody>
<tr>
<td>UE^M</td>
<td>10,955</td>
<td>0.08</td>
<td>0.13</td>
<td>0.03</td>
<td>0.00</td>
<td>0.18</td>
</tr>
<tr>
<td>UE^A</td>
<td>10,955</td>
<td>0.04</td>
<td>0.07</td>
<td>0.02</td>
<td>0.00</td>
<td>0.09</td>
</tr>
<tr>
<td>CAR</td>
<td>10,955</td>
<td>1.13</td>
<td>1.44</td>
<td>1.11</td>
<td>-0.72</td>
<td>3.03</td>
</tr>
<tr>
<td>Size</td>
<td>10,955</td>
<td>7.05</td>
<td>1.60</td>
<td>6.89</td>
<td>5.08</td>
<td>9.24</td>
</tr>
<tr>
<td>MVE</td>
<td>10,955</td>
<td>5,824.13</td>
<td>21,507.7</td>
<td>1203.25</td>
<td>205.46</td>
<td>11,031.50</td>
</tr>
<tr>
<td>Sales</td>
<td>10,955</td>
<td>1,149.79</td>
<td>4,536.62</td>
<td>236.73</td>
<td>31.00</td>
<td>2,459.81</td>
</tr>
<tr>
<td>Lev</td>
<td>10,955</td>
<td>0.24</td>
<td>0.36</td>
<td>0.11</td>
<td>0.00</td>
<td>0.62</td>
</tr>
</tbody>
</table>

The variables shown in the Table have been drawn from the sample defined in Table 1. Panel A shows our full sample. Panel B focuses on those observations only which indicate that analysts appear to disagree with management guidance. Panel C focuses on those observations for which analysts appear to agree with management guidance. The variables are defined as follows: UE^M: The absolute difference between actual earnings per share and the management forecast of earnings per share for the quarter; UE^A: The absolute difference between actual earnings per share and the last median analysts’ forecast of earnings per share for the quarter; CAR: The three-day size-adjusted cumulative abnormal return around earnings announcement; Size: The natural logarithm total assets at the end of the quarter; MVE: The market value of equity at the end of the quarter (in million dollars); Sales: The total sales at the end of the quarter (in million dollars); Lev: Leverage, defined as the ratio of short-term debt and long-term debt to the current market value of equity.
Table 3: Incremental Information Content of the Management Forecast Error at the Time of Earnings Announcements

Panel A: Partial Correlations of Management Forecast Errors with the 3-day size adjusted Cumulative Abnormal Return (CAR)

<table>
<thead>
<tr>
<th></th>
<th>Disagreement Sample (N= 2,382)</th>
<th>Agreement Sample (N= 10,955)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation Coefficient</td>
<td>0.047**</td>
<td>-0.007</td>
</tr>
<tr>
<td>p-value</td>
<td>0.023</td>
<td>0.509</td>
</tr>
</tbody>
</table>

***, ** and * denote statistical significance at the 1%, 5% and 10% levels respectively.
Panel B: Regression analysis to test the incremental Information Content of the Management Forecast Error

\[ CAR_{it} = \alpha_0 + \alpha_1 Pred_{it} + \beta_1 Resid_{it} + \beta_2 Size_{it} + \beta_3 Growth_{it} + \beta_4 Lev_{it} + \epsilon_{it} \]

<table>
<thead>
<tr>
<th></th>
<th>Disagreement Sample (N= 2,382)</th>
<th>Agreement Sample (N= 10,955)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept ((\hat{\alpha}_0))</td>
<td>1.095***</td>
<td>0.828***</td>
</tr>
<tr>
<td></td>
<td>(7.75)</td>
<td>(11.85)</td>
</tr>
<tr>
<td>Pred ((\hat{\alpha}_1))</td>
<td>0.273</td>
<td>0.573***</td>
</tr>
<tr>
<td></td>
<td>(0.72)</td>
<td>(2.87)</td>
</tr>
<tr>
<td>Resid ((\hat{\beta}_1))</td>
<td>0.281**</td>
<td>-0.076</td>
</tr>
<tr>
<td></td>
<td>(2.28)</td>
<td>(-0.66)</td>
</tr>
<tr>
<td>Size ((\hat{\beta}_2))</td>
<td>-0.009</td>
<td>0.017*</td>
</tr>
<tr>
<td></td>
<td>(-0.49)</td>
<td>(1.81)</td>
</tr>
<tr>
<td>Growth ((\hat{\beta}_3))</td>
<td>0.056***</td>
<td>0.076***</td>
</tr>
<tr>
<td></td>
<td>(4.68)</td>
<td>(11.63)</td>
</tr>
<tr>
<td>Lev ((\hat{\beta}_4))</td>
<td>-0.195*</td>
<td>-0.166***</td>
</tr>
<tr>
<td></td>
<td>(-1.90)</td>
<td>(-3.81)</td>
</tr>
<tr>
<td>Adj R-sq</td>
<td>1.40</td>
<td>1.82</td>
</tr>
</tbody>
</table>

***, ** and * denote statistical significance at the 1%, 5% and 10% levels respectively.

The t-statistics reported in the table are based on standard errors clustered at the firm and year levels.

The regression results are based on the sample identified in Table 1. The management forecast error in Panel A is defined as the difference between the actual earnings per share and the management forecast of earnings per share, both obtained from Thomson Reuters’ First Call database, scaled by the closing stock price of the previous quarter. The regression results are based on the sample identified in Table 1. The variables in Panel B are defined thus: Pred and Resid are defined as the predicted value and residual respectively from a regression of the management forecast error (defined in Panel A) on the last consensus analyst forecast error (defined as the difference between the actual earnings per share and the consensus analyst forecast of earnings per share, both obtained from Thomson Reuters’ First Call database, scaled by the closing stock price of
the previous quarter); Size is defined as the natural logarithm of total assets; Growth is the firm’s closing market-to-book ratio; Lev is the firm’s leverage, defined in Table 2 above.
Table 4: The Effect of Firm Size on the Incremental Information Content of the Management Forecast Error

Panel A: Partial Correlations of Management Forecasts Errors with the 3-day Size-Adjusted Cumulative Abnormal Returns (CAR)

<table>
<thead>
<tr>
<th></th>
<th>Small</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Disagreement Sample</td>
<td>Agreement Sample</td>
</tr>
<tr>
<td></td>
<td>(N= 1,191)</td>
<td>(N= 5,477)</td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>0.023</td>
<td>0.004</td>
</tr>
<tr>
<td>p-value</td>
<td>0.436</td>
<td>0.787</td>
</tr>
</tbody>
</table>

***, ** and * denote statistical significance at the 1%, 5% and 10% levels respectively.
Panel B: Regression Analysis to test the Incremental Information Content of Management Forecast Error

\[ CAR_{it} = \alpha_0 + \alpha_1 Pred_{it} + \beta_1 Resid_{it} + \beta_2 Growth_{it} + \beta_3 Lev_{it} + \epsilon_{it} \]

<table>
<thead>
<tr>
<th></th>
<th>Small Disagreement Sample (N= 1,191)</th>
<th>Small Agreement Sample (N= 5,477)</th>
<th>Large Disagreement Sample (N= 1,191)</th>
<th>Large Agreement Sample (N= 5,478)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept ((\alpha_0))</td>
<td>1.030*** (11.33)</td>
<td>0.797*** (20.60)</td>
<td>1.091*** (13.79)</td>
<td>1.208*** (30.92)</td>
</tr>
<tr>
<td>Pred ((\alpha_1))</td>
<td>0.670 (0.87)</td>
<td>1.250*** (3.23)</td>
<td>0.049 (0.13)</td>
<td>0.117 (0.56)</td>
</tr>
<tr>
<td>Resid ((\beta_1))</td>
<td>0.203 (0.78)</td>
<td>0.064 (0.27)</td>
<td>0.312*** (2.48)</td>
<td>-0.140 (-1.19)</td>
</tr>
<tr>
<td>Growth ((\beta_2))</td>
<td>0.080*** (4.48)</td>
<td>0.116*** (12.57)</td>
<td>0.023 (1.44)</td>
<td>0.008 (0.90)</td>
</tr>
<tr>
<td>Lev ((\beta_3))</td>
<td>-0.639*** (-2.79)</td>
<td>-0.270*** (-3.46)</td>
<td>-0.110 (-1.07)</td>
<td>-0.190*** (-3.98)</td>
</tr>
<tr>
<td>Adj R-sq</td>
<td>2.62</td>
<td>3.86</td>
<td>0.52</td>
<td>0.38</td>
</tr>
</tbody>
</table>

***, ** and * denote statistical significance at the 1%, 5% and 10% levels respectively.

The t-statistics reported in the table are based on standard errors clustered at the firm and year levels.

The Table above is based on the sample identified in Table 1. The partitioning variable is size (defined as in Table 3 above). Small and Large respectively indicate that the observation for size lies below and above the median of the distribution. The variables are as defined in Tables 2 and 3.
Table 5: The Effect of Firm Growth on the Incremental Information Content of the Management Forecast Error

*Panel A: Partial Correlations of Management Forecasts Errors with the 3-day Growth-Adjusted Cumulative Abnormal Returns (CAR)*

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Disagreement Sample</td>
<td>Agreement Sample</td>
</tr>
<tr>
<td></td>
<td>(N= 1,191)</td>
<td>(N= 5,477)</td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>0.063**</td>
<td>-0.026*</td>
</tr>
<tr>
<td>p-value</td>
<td>0.043</td>
<td>0.069</td>
</tr>
<tr>
<td></td>
<td>Disagreement Sample</td>
<td>Agreement Sample</td>
</tr>
<tr>
<td></td>
<td>(N= 1,191)</td>
<td>(N= 5,478)</td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>0.032</td>
<td>0.011</td>
</tr>
<tr>
<td>p-value</td>
<td>0.239</td>
<td>0.477</td>
</tr>
</tbody>
</table>

***, ** and * denote statistical significance at the 1%, 5% and 10% levels respectively.
Panel B: Regression analysis to test the incremental Information Content of the Management Forecast Error

\[ CAR_{it} = \alpha_0 + \alpha_1 Pred_{it} + \beta_1 Resid_{it} + \beta_2 Size_{it} + \beta_3 Lev_{it} + \epsilon_{it} \]

<table>
<thead>
<tr>
<th></th>
<th>Low Sample</th>
<th>Agreement Sample</th>
<th>High Sample</th>
<th>Disagreement Sample</th>
<th>Agreement Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(N= 1,191)</td>
<td>(N= 5,477)</td>
<td>(N= 1,191)</td>
<td>(N= 5,478)</td>
<td></td>
</tr>
<tr>
<td>Intercept ((\bar{\alpha}_0))</td>
<td>0.284***</td>
<td>1.923***</td>
<td>1.889***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.79)</td>
<td>(2.86)</td>
<td>(11.44)</td>
<td>(20.98)</td>
<td></td>
</tr>
<tr>
<td>Pred ((\bar{\alpha}_1))</td>
<td>0.219</td>
<td>0.470</td>
<td>0.892***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.23)</td>
<td>(0.79)</td>
<td>(1.03)</td>
<td>(3.12)</td>
<td></td>
</tr>
<tr>
<td>Resid ((\bar{\beta}_1))</td>
<td>-0.319*</td>
<td>0.250</td>
<td>0.106</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.03)</td>
<td>(-1.82)</td>
<td>(1.18)</td>
<td>(0.71)</td>
<td></td>
</tr>
<tr>
<td>Size ((\bar{\beta}_2))</td>
<td>0.101***</td>
<td>-0.080***</td>
<td>-0.071***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.88)</td>
<td>(-7.01)</td>
<td>(-3.49)</td>
<td>(-5.50)</td>
<td></td>
</tr>
<tr>
<td>Lev ((\bar{\beta}_3))</td>
<td>-0.169***</td>
<td>-0.200</td>
<td>-0.217**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-2.05)</td>
<td>(-3.25)</td>
<td>(-1.15)</td>
<td>(-2.34)</td>
<td></td>
</tr>
<tr>
<td>Adj R-sq</td>
<td>0.89</td>
<td>1.01</td>
<td>1.18</td>
<td>1.29</td>
<td></td>
</tr>
</tbody>
</table>

***, ** and * denote statistical significance at the 1%, 5% and 10% levels respectively.

The t-statistics reported in the table are based on standard errors clustered at the firm and year levels.

The Table above is based on the sample identified in Table 1. The partitioning variable is growth (defined as the market-to-book ratio in Table 3 above). Low and High respectively indicate that the observation for growth lies below and above the median of the distribution. The variables are as defined in Tables 2 and 3.

Table 6: The Effect of Firm Size on the Incremental Information Content of Management Forecasts
Panel A: Partial Correlations of Management Forecasts Errors with the 3-day Size-Adjusted Cumulative Abnormal Returns (CAR)

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th></th>
<th>High</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Disagreement</td>
<td>Agreement</td>
<td>Disagreement</td>
<td>Agreement</td>
</tr>
<tr>
<td>Sample</td>
<td>Sample</td>
<td>Sample</td>
<td>Sample</td>
<td>Sample</td>
</tr>
<tr>
<td>(N= 1,191)</td>
<td>(N= 5,477)</td>
<td>(N= 1,191)</td>
<td>(N= 5,478)</td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>0.009</td>
<td>-0.020</td>
<td>0.068**</td>
<td>-0.005</td>
</tr>
<tr>
<td>p-value</td>
<td>0.742</td>
<td>0.174</td>
<td>0.032</td>
<td>0.736</td>
</tr>
</tbody>
</table>

***, ** and * denote statistical significance at the 1%, 5% and 10% levels respectively.
Panell B: Regression analysis to test the incremental Information Content of Management Forecasts

\[ \text{CAR}_{it} = \alpha_0 + \alpha_1 \text{Pred}_{it} + \beta_1 \text{Resid}_{it} + \beta_2 \text{Size}_{it} + \beta_3 \text{Growth}_{it} + \beta_4 \text{Lev}_{it} + \epsilon_{it} \]

<table>
<thead>
<tr>
<th></th>
<th>Low Disagreement Sample</th>
<th>Low Agreement Sample</th>
<th>High Disagreement Sample</th>
<th>High Agreement Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept ((\alpha_0))</td>
<td>0.762***</td>
<td>1.327***</td>
<td>0.986***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.72)</td>
<td>(7.40)</td>
<td>(5.82)</td>
<td>(9.75)</td>
</tr>
<tr>
<td>Pred ((\beta_1))</td>
<td>1.281**</td>
<td>0.329</td>
<td>0.337</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.37)</td>
<td>(2.66)</td>
<td>(0.87)</td>
<td>(1.57)</td>
</tr>
<tr>
<td>Resid ((\beta_1))</td>
<td>-0.263</td>
<td>0.328**</td>
<td>-0.047</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.33)</td>
<td>(-1.36)</td>
<td>(2.15)</td>
<td>(-0.34)</td>
</tr>
<tr>
<td>Size ((\beta_2))</td>
<td>0.019</td>
<td>-0.030</td>
<td>0.004</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.63)</td>
<td>(1.24)</td>
<td>(-1.06)</td>
<td>(0.32)</td>
</tr>
<tr>
<td>Growth ((\beta_3))</td>
<td>0.082***</td>
<td>0.053**</td>
<td>0.077***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3.74)</td>
<td>(8.38)</td>
<td>(2.80)</td>
<td>(8.43)</td>
</tr>
<tr>
<td>Lev ((\beta_4))</td>
<td>-0.216***</td>
<td>-0.128</td>
<td>-0.144**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-2.15)</td>
<td>(-3.16)</td>
<td>(-0.96)</td>
<td>(-2.57)</td>
</tr>
<tr>
<td>Adj R-sq</td>
<td>1.45</td>
<td>1.94</td>
<td>1.33</td>
<td>1.85</td>
</tr>
</tbody>
</table>

***, ** and * denote statistical significance at the 1%, 5% and 10% levels respectively.

The t-statistics reported in the table are based on standard errors clustered at the firm and year levels.

The Table above is based on the sample identified in Table 1. The partitioning variable is analyst forecast dispersion (defined as the standard deviation of the last individual analyst forecast for the quarter). Low and High respectively.
indicate that the observation for size lies below and above the median of the distribution. The variables are as defined in Tables 2 and 3.