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Analyst reputation and management earnings forecasts ☆

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ABSTRACT

Prior studies show that analysts with high reputation are influential in the market. This paper examines whether managers consider analyst reputation in shaping their voluntary disclosure strategy. Using Institutional Investor magazine's All-American (AA) rankings as a proxy for analyst reputation, we find that the coverage of AA analysts is positively associated with the likelihood of quarterly management earnings forecasts (MEFs). We also find that AA analysts' forecast optimism is more positively associated with the likelihood of MEFs than non-AA analysts' forecast optimism when the firm is covered by AA analysts. Analyses based on AA analyst coverage changes and AA status changes confirm the relation between analyst reputation and MEFs. We further find that analyst reputation influences other MEF properties, such as forecast news, bias, and revisions, and that our results are robust to alternative measures of analyst reputation. Further analyses show that market reactions at quarterly earnings announcements are more positive (negative) when firms meet/beat (miss) AA analysts' forecasts than when firms meet/beat (miss) non-AA analysts' forecasts. Collectively, our findings suggest that managers strategically provide voluntary forecasts by taking into account the reputation of individual analysts following their firms.

1. Introduction

This paper examines whether the reputation of individual analysts following a firm affects the firm's voluntary disclosure practice. Despite evidence of analyst heterogeneity (e.g., Stickel, 1992; Gleason and Lee, 2003; Bonner et al., 2007; Loh and Stulz, 2011), prior studies do not recognize the possibility that managers consider analyst reputation in shaping their voluntary disclosure strategy.[1] Using Institutional Investor magazine's (II's) All-American (AA) rankings as a proxy for analyst reputation, we examine whether the incidence and various properties of quarterly management earnings forecasts (MEFs) are associated with reputable analysts' coverage and their forecast optimism.

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[1] A notable exception is Zhou (2019) that examines whether the optimism of influential analysts is associated with management earnings forecasts more than the optimism of the other analysts. We discuss the differences between our study and Zhou (2019) later in this section.

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MEFs, an explicit form of earnings guidance, provide information about expected earnings for a particular firm and are a key voluntary disclosure mechanism by which managers establish or alter earnings expectations in the market (Hirst et al., 2008). Although firms have long- or medium-term earnings guidance policies, not all firms that issue earnings guidance make MEFs every quarter. That is, managers have discretion to issue or skip MEFs in any given quarter.[2] We examine whether managers consider analyst reputation in their disclosure decisions.

Analysts' reputation can affect MEFs through at least two channels. First, Dye (1988) suggests that voluntary disclosure increases as the probability of market participants being informed increases. Considering that AA analysts have better forecasting ability than non-AA analysts (Stickel, 1992) and are more likely to be associated with big brokerage firms than non-AA analysts, it is reasonable to expect that AA analysts are more informed than non-AA analysts. Thus, we expect that firms followed by AA analysts are more likely to make voluntary disclosures than firms without an AA analyst following. Second, considering that analysts revise their forecasts in response to MEFs (e.g., Baginski and Hassell, 1990; Cotter et al., 2006) and that AA analysts are more influential than non-AA analysts (e.g., Park and Stice, 2000; Gleason and Lee, 2003; Loh and Stulz, 2011), managers have greater incentives to issue MEFs, because adjusting market expectations through MEFs would be more efficient when AA analysts cover the firm than when no AA analyst covers the firm.

We focus on AA status as a proxy for analyst reputation for several reasons. First, using AA status as a proxy for reputable analysts enables us to examine the effect of reputable analysts' coverage on a firm's disclosure decisions. Kirk et al. (2014) and Zhou (2019) use "key or influential analysts" as a proxy for reputable analysts. Key or influential analysts are defined as those who have the greatest composite score among all analysts following a firm during a quarter, where the composite score is calculated using eight analyst and forecast characteristics. Accordingly, every firm has a key or influential analyst for each quarter by design, and thus we cannot examine whether the coverage of reputable analysts influences a firm's disclosure decision. Moreover, AA analysts are chosen by Institutional Investor magazine, and the same set of AA analysts is applied to all firms in any given year. Therefore, unlike reputable analysts defined in the Kirk et al. (2014) and Zhou (2019), the identification of reputable analysts based on AA analysts is less likely to be shaped by firm-quarter specific factors.[3]

Second, more importantly, the use of AA analysts enables us to conduct a test based on AA analysts' status change. This quasi-natural experiment helps strengthen the causal interpretation of the results. A new listing in and a drop from the Institutional Investor's AA ranking are events that change perceptions about an analyst's reputation. The change of an analyst's status, either from non-AA to AA or from AA to non-AA, is unlikely to be influenced by an individual firm's disclosure practice to a large extent.

We test our empirical predictions using a sample of firm-quarters that are covered by at least one of II's AA analysts between 2001 and 2010 and a matched sample of firm-quarters that are not covered by AA analysts. We find that firms followed by AA analysts are more likely to issue quarterly MEFs than firms not followed by AA analysts. AA analyst coverage is associated with a 5.8% increase in the likelihood of MEFs from the sample mean. We also find that firms are more likely to issue quarterly MEFs when AA analysts' early forecasts are more optimistic. A one-standard-deviation increase in AA analysts' forecast optimism is associated with a 13.9% increase in the likelihood of MEFs from the sample mean. Moreover, AA analysts' forecast optimism is more positively associated with the likelihood of MEFs than non-AA analysts' forecast optimism when the firm is covered by AA analysts. These results suggest that the coverage and forecast optimism of AA analysts have a greater influence on a firm's voluntary disclosure practice than those of other analysts.

Our results are robust to firm fixed effects that address the concern that time-invariant unobservable firm characteristics might drive the results. Our results are also robust to alternative measures of AA analyst coverage and AA analysts' relative forecast optimism, as well as alternative analyst forecast windows. Our inferences remain the same even if we exclude MEFs issued on or after the fiscal quarter end.[4]

Although the positive relation between the likelihood of MEFs and AA analyst coverage is consistent with the argument that managers shape their voluntary disclosure strategy in response to such coverage, it is possible that AA analysts increase (decrease) their coverage when firms provide more (less) forward-looking earnings information. We address this endogeneity challenge by examining the initiation and discontinuation of AA analyst coverage. We find that managers are more (less) likely to issue MEFs when AA analysts initiate (drop) coverage. We also utilize a quasi-natural experiment based on changes in an analyst's AA status. We find that firms are more likely to issue MEFs when an analyst who has been following the firm changes her/his status from non-AA to AA. Because the same analyst has been covering the firm, the positive relation between the incidence of MEFs and the change in the analyst's status cannot be explained by the analyst making a coverage choice in response to more forward-looking information available through MEFs.

Considering that managers determine various properties of MEFs in addition to the incidence of MEFs, we also examine a set of MEF properties, including news, bias, and revisions of management forecasts. Managers have discretion to change these properties even when firms have policies that address whether, when, and how to issue quarterly earnings guidance

[2] We find that about 46.1% of our sample firms that issue MEFs during the fiscal year issue MEFs in at least three out of four quarters.

[3] We may construct a measure of reputable analysts based on analyst characteristics in a way that not every firm-quarter has a key analyst and conduct the coverage test based on such a measure. To define a reputable analyst based on the composite analyst score as in Kirk et al. (2014), however, we need a threshold level of the score and have to make a subjective judgment on the threshold level. In contrast, we do not have to rely on a subjective judgment if we define reputable analysts based on AA analysts.

[4] Consistent with Cotter et al. (2006), Baik and Jiang (2006), and Feng et al. (2009), we do not exclude earnings pre-announcements in the main analyses, because such MEFs also contribute to expectations management.

(Hirst et al., 2008). We find that for the sample of firms that are covered by AA analysts, the news and bias of MEFs are more negative when AA analysts' early forecasts are more optimistic, consistent with managers' incentive to guide AA analysts' (and market) expectations downward. We do not observe such relations for non-AA analysts' forecasts. We also find that managers are more likely to update MEFs issued earlier in the quarter if AA analysts' forecasts are more optimistic, suggesting that managers have incentives to deflate AA analysts' early forecast optimism. Although we find the same positive relation between non-AA analysts' forecast optimism and managers' MEF revisions, this positive relation is more pronounced for AA analysts' forecasts than for non-AA analysts' forecasts when the firm is covered by AA analysts. Collectively, our findings suggest that managers provide voluntary disclosures strategically by taking into account the reputation of individual analysts following their firms.

We also check to see if our findings are robust to alternative measures of analyst reputation based on analysts' experience, the size of the brokerage firms for which they work, and the accuracy of their past forecasts. We find that the forecast optimism of more reputable analysts (i.e., analysts who have more experience, work for larger brokerage houses, or made more accurate past forecasts) has a more positive impact on the likelihood of MFEs than that of less reputable analysts. These results are largely consistent with our main findings based on AA rankings.

An underlying premise for our analysis of AA analysts' forecast optimism is that the consequence of meeting/beating AA analysts' forecasts is greater than that of meeting/beating non-AA analysts' forecasts. Thus, we examine the market reaction to meeting/beating AA analyst forecasts at the quarterly earnings announcements to provide ex-post validation for this premise. While we find a premium for meeting/beating AA analyst forecasts, there is an incremental negative reaction to missing AA analyst forecasts. These results support our argument that meeting/beating reputable analysts' forecasts has a greater consequence than meeting/beating those of other analysts, motivating managers to guide down reputable analysts' optimistic forecasts by issuing MEFs.

Our study makes several important contributions. It adds to the voluntary disclosure literature in general and to the literature on determinants of the incidence and properties of MEFs in particular. Earlier studies find a positive association between analyst coverage and voluntary disclosure (Lang and Lundholm, 1993, 1996; Graham et al., 2005; Ajinkya et al., 2005). Cotter et al. (2006) find that managers are more likely to issue MEFs when analysts' early forecasts are optimistic.[5] Nagar et al. (2003) show that managers choose the frequency of MEFs strategically. Billings and Buslepp (2016) also provide evidence of strategic management guidance around insider trading activities. We extend this line of research by showing that the reputation of individual analysts covering a firm influences how managers shape their voluntary disclosure strategy.

Our study also contributes to the literature on analyst research in general and to the literature on the effect of analyst reputation (e.g., AA analysts) in particular by providing evidence on the role of analyst heterogeneity in shaping firms' voluntary disclosure strategies. By contrast, prior studies explore the effect of analyst heterogeneity on forecast accuracy (e.g., Stickel, 1992), the price impact of analyst forecasts (e.g., Stickel, 1992; Gleason and Lee, 2003; Loh and Stulz, 2011), and investors' evaluations of reported earnings at the time of earnings announcements (e.g., Kirk et al., 2014). We extend the concept of heterogeneity among security analysts to the "voluntary disclosure" setting.

A recent study by Zhou (2019) is closely related to our paper, but important differences exist between the two studies. Zhou (2019) defines 'influential analysts' following Kirk et al. (2014). As we discussed earlier, this measure does not allow one to examine how managers respond to reputable analysts' coverage. In contrast, we examine how firms adjust their disclosure policy in response to reputable analysts' coverage, using AA status as a measure of analyst reputation. In addition, we examine not only the incidence of management earnings forecasts but also various other properties of management earnings forecasts and provide ex-post validation that supports our main argument. Thus, while complementing Kirk et al. (2014) and Zhou (2019), our findings extend beyond the findings in these two studies.

The rest of this paper is organized as follows. In Section 2, we discuss the relevant literature and develop hypotheses. Section 3 describes the sample and research design. We present empirical results in Section 4 and additional analyses in Section 5. We conclude in Section 6.

2. Literature review and hypotheses development

Prior studies show that analysts with high reputation are more influential in the market than other analysts. Stickel (1992) finds that AA analysts' forecasts are more accurate and that the price impacts of AA analysts' forecast revisions are greater than those of other analysts' forecast revisions. Park and Stice (2000) also show that market responses are stronger to forecast revisions made by analysts with better past forecasting ability than to those made by other analysts. Gleason and Lee (2003) provide evidence that the price adjustment process is faster and more complete for AA analysts' forecasts than for

[5] Without considering analyst heterogeneity, Anantharaman and Zhang (2011) find that managers do not respond to increases in analyst coverage, while they increase MEFs in response to decreases in analyst coverage. Balakrishnan et al. (2014) similarly find that managers increase earnings guidance after a loss of analyst coverage to improve liquidity. These results suggest that firm disclosures and analyst coverage can be substitutes as a source of public information. In contrast, we find that firms are more (less) likely to issue MEFs when AA analysts initiate (drop) coverage, suggesting that managerial responses to changes in analyst coverage might vary across the degrees of analyst reputation. The difference in the results between our study and the other two studies may arise because we examine management forecasts of quarterly earnings issued later in the quarter and thus focus on the expectations management incentive, while Anantharaman and Zhang (2011) examine all types of management forecasts over the entire fiscal year and Balakrishnan et al. (2014) consider all quarterly forecasts issued during the fiscal quarter.

other analysts' forecasts. Loh and Stulz (2011) find that AA analysts and analysts who have had influential recommendations in the past are more likely than other analysts to influence returns and turnover. Bonner et al. (2007) show that the market reacts more strongly to earnings forecast revisions made by "celebrity" analysts, who are heavily featured in the media, relative to forecast revisions made by other analysts. In general, the literature suggests that security analysts are homogeneous in neither their earnings forecasting ability nor their influence on market participants.

Firms may shape their voluntary disclosure practice by taking into account financial analysts' reputation at least for two reasons. First, disclosure theories suggest that the probability of market participants being informed affects voluntary disclosures. Dye (1985) suggests that managers are more likely to disclose when the probability of managers' information possession increases and that market participants evaluate this probability. Even if managers possess information, when market participants have no ability to evaluate whether or not managers are informed, full disclosure cannot be achieved. Compared to uninformed market participants, informed market participants are more likely to know when the firm receives information that has not been disclosed. Thus, voluntary disclosure increases as the probability of market participants being informed increases (Dye, 1998). We argue that there are at least two reasons why AA analysts are more likely to be informed. First, AA analysts have better forecasting ability than non-AA analysts (Stickel, 1992). In addition, AA analysts are more likely to be associated with big brokerage firms than non-AA analysts. Accordingly, AA analysts can take advantage of the abundant resources of the bigger brokerage firms. As AA analysts are more informed than non-AA analysts, the threshold level of disclosures is likely to be lower for firms followed by AA analysts than for those followed by non-AA analysts. Thus, we predict that firms followed by AA analysts are more likely to make voluntary disclosures than firms without an AA analyst following.

Second, it might be more efficient for managers to adjust market expectations by issuing MEFs when AA analysts follow their firm. Considering that analysts revise their forecasts in response to MEFs (e.g., Baginski and Hassell, 1990; Cotter et al., 2006) and that AA analysts are more influential than non-AA analysts (e.g., Park and Stice, 2000; Gleason and Lee, 2003; Loh and Stulz, 2011), managers have greater incentives to issue MEFs, because adjusting market expectations through MEFs would be more efficient when AA analysts cover the firm than when no AA analyst covers the firm.[6], [7]

The relation between AA analyst coverage and the likelihood of management earnings forecasts, however, can be insignificant or even negative. Some studies suggest that firms' disclosures and analyst coverage can be substitutes as a source of public information (Anantharaman and Zhang, 2011; Balaskrishnan et al., 2014). Further, to the extent that AA analysts issue more informative forecasts, as suggested by prior studies (e.g., Stickel, 1992), the coverage of AA analysts may decrease investors' demand for public information, leading managers to make fewer voluntary disclosures. Thus, we may find a negative relation between AA analyst coverage and the likelihood of MEFs. Ultimately, it is an empirical question whether managers are more or less likely to issue MEFs when AA analysts cover their firms. We posit the first hypothesis in an alternative form:

H1: Firms that are followed by All-American analysts are more likely to issue management earnings forecasts than firms that are not followed by All-American analysts.

Prior studies show that managers attempt to meet or beat analyst expectations and to avoid negative earnings surprises, because such surprises generally lead to negative price responses at the actual earnings announcements. Skinner and Sloan (2002) document that the absolute magnitude of the price response to negative surprises significantly exceeds that of the price response to positive surprises. Thus, managers have a strong incentive to avoid negative surprises. One way to meet or beat analysts' expectations is to guide those expectations downward to a level that the firm can meet or beat. As key providers of information to financial analysts, managers who voluntarily disseminate information regarding forthcoming earnings often deliberately attempt to affect analysts' earnings projections. Bartov et al. (2002), Matsumoto (2002), and Richardson et al. (2004) find evidence suggesting that managers guide analysts' earnings expectations downward to avoid negative earnings surprises. In particular, Richardson et al. (2004) find that analysts first issue optimistic earnings forecasts and then "walk down" their estimates to a level that firms can subsequently beat at the official earnings announcements.

Cotter et al. (2006) argue that managers use public earnings guidance (i.e., MEFs) to deflate analysts' initial optimism and influence analysts' consensus targets. They find that voluntary disclosure of MEFs is more likely when analysts' early forecasts are more optimistic and conclude that MEFs play a direct role in leading analyst forecasts toward achievable earnings targets. As in other prior studies, Cotter et al. (2006) implicitly assume that all analysts are homogeneous, as these authors use consensus targets in determining analyst forecast optimism. Evidence suggests, however, that reputable analysts are more influential than other analysts (Stickel, 1992; Gleason and Lee, 2003; Loh and Stulz, 2011). Using a firm-quarter specific "key analyst" measure, Kirk et al. (2014) find that if a firm misses the key analyst forecast, it does not experience a positive

[6] "Influential" analysts are defined as those who have greater price impact than other analysts. For example, Stickel (1992) finds that large upward forecast revisions of AA analysts move stock prices more than those of upward forecast revisions of other analysts.

[7] We do not claim that firms not followed by AA analysts have no incentive to issue MEFs. Firms may have other incentives to issue MEFs as voluntary disclosures: to reduce information asymmetry, to improve liquidity, to lower the cost of capital, or to lower stock volatility (Healy and Palepu 2001). The focus of our paper is an incentive to adjusting market expectations to achieve beatable earnings targets (Cotter et al. 2006). We argue that holding other incentives the same, managers have greater incentives to issue MEFs when AA analysts follow the firm because the AA analysts have greater price impact than other analysts and therefore adjusting market expectation is more effective and efficient when AA analysts follow the firm. That is, firms can more easily influence market expectations when AA analysts revise their forecasts in response to MEFs and their forecast revisions change market expectations. In our empirical analyses, we control for other known factors that influence the decision to issue MEFs.

earnings announcement stock return even if it meets the consensus forecast. Their finding suggests that investors consider the reputable analyst's forecast as a more important performance benchmark to meet or beat than other analysts' forecasts.

Because meeting/beating AA analysts' forecasts has greater consequences than meeting/beating those of other analysts, managers will exert more effort to guide down AA analysts' early forecast optimism when the firm is covered by AA analysts. Thus, we predict that AA analysts' forecast optimism is more positively associated with the likelihood of MEFs than non-AA analysts' forecast optimism when the firm is covered by AA analysts.[8] Please note that while our first hypothesis relates AA analyst coverage to the likelihood of MEFs, our second hypothesis relates AA analysts' forecast optimism to the likelihood of MEFs and explores the importance of AA analysts' forecast optimism to managers relative to non-AA analysts' forecast optimism in making their decisions to issue MEFs. Our second hypothesis is stated in an alternative form.[9]

H2: AA analysts' forecast optimism is more positively associated with the likelihood of management earnings forecasts than non-AA analysts' forecast optimism.

3. Data and research design

3.1. Sample and data

We start with the I/B/E/S details file to collect analysts' earnings forecasts for firm-quarters in 2001–2010. We merge these data with MEF data from the Company Issued Guidelines (CIG) of Thomson Financial's First Call Historical Database (FCHD). We begin our sample period in 2001, because Regulation Fair Disclosure (Reg. FD) was implemented in October 2000 and prior studies suggest that this regulation has a significant impact on firm disclosure practices, including MEFs (e.g., Bailey et al., 2003; Kim and Song, 2015; Kross and Suk, 2012). We end the sample period in 2010 because Thomson Financial temporarily suspended the CIG in 2011 and then changed the way it compiles management forecasts.

Since not all firm-quarters are covered by First Call, to ensure that our results are not driven by First Call coverage but by the firm's disclosure decision, we require the sample firm-quarter to be included in the First Call's analyst forecast dataset (i.e., we require First Call consensus analyst forecasts to exist). We obtain stock returns from the Center for Research in Security Prices (CRSP), accounting data from Compustat, and institutional ownership data from Thomson Financial's 13F database.

Following Stickel (1992), Gleason and Lee (2003), and Loh and Stulz (2011), we use Institutional Investor magazine's (II's) All-American (AA) rankings to proxy for analyst reputation. Following Stickel (1992) and Loh and Stulz (2011), we consider analysts ranked at any position, including the "runner up" ranking, as AA analysts. In October of every year, II announces a list of AA analysts. If an analyst is included in the immediately preceding year's II's AA rankings, we classify her/him as an AA analyst from November of that year through the subsequent year.[10] Over our sample period, about 8.8% of analysts are AA analysts. For firm-quarters covered by AA analysts, the median number of analysts following the firm is 11, of which 2 are AA analysts. Once analysts achieve AA status, they keep their status for 3.4 years, on average.

To examine how managers shape their voluntary disclosure strategy in response to the coverage and forecast optimism of AA and non-AA analysts, we first determine the analyst coverage and forecast bias based on analyst forecasts of quarter t earnings issued between the quarter t − 1 earnings announcement and 11 days after the quarter t − 1 earnings announcement (the "analyst forecast window" hereafter).[11] If an analyst issues more than one forecast in this window, we take the most recent forecast to determine forecast optimism.[12] We then examine whether managers provide public guidance of quarterly earnings (i.e., quarterly MEFs) in the period from 12 days after the quarter t − 1 earnings announcement to the quarter t earnings announcement (the "earnings guidance window" hereafter).[13] Fig. 1 depicts the timeline of the analyst forecast window and the earnings guidance window.

We require firm-quarter observations to have at least one non-AA analyst-issued earnings forecast in the analyst forecast window. We also exclude firm-quarter observations without AA analyst coverage if the firm was covered by AA analysts in any of the previous 12 quarters to mitigate the lingering effect of being covered by AA analysts.[14] After excluding firm-

[8] We are interested in comparing the influences of AA analysts' forecast optimism and non-AA analysts' forecast optimism on the likelihood of MEFs. Because AA analysts' forecast optimism cannot be defined for the sample of firm-quarters that are not covered by AA analysts, we focus on the sample of firm-quarters that are covered by AA analysts to test the second hypothesis.

[9] We note that our second hypothesis is consistent with the expectations-adjustment argument in Ajinkya and Gift (1984), but the theory in Dye (1998) cannot explain the relation between AA analysts' forecast optimism and the incidence of MEFs. In Dye (1998), the probability that information users are informed or uninformed, not the level of their expectation, affects voluntary disclosures.

[10] In other words, AA status is valid only for the subsequent 12 months from November of the listed year.

[11] A firm is considered as being covered by AA analysts if any AA analyst has issued an earnings forecast for the current quarter (quarter *t*) during the analyst forecast window.

[12] We use the most recent analyst forecast to determine analyst forecast optimism, because the most recent forecast reflects the prevailing market expectation that managers have incentives to meet or beat. Still, from the managers' perspective, these analyst forecasts represent *early* forecast optimism.

[13] As a robustness test, we also use alternative analyst forecast windows and earnings guidance windows. Our results are robust to alternative analyst forecast windows (e.g., up to 45 days after quarter *t-1* earnings announcement or up to two weeks before the quarter *t* earnings announcement) and corresponding earnings guidance windows. See related discussion in Section 4.4 for more details.

[14] Prior studies (e.g., Bushee et al., 2003; Skinner, 2003; Graham et al., 2005) show that voluntary disclosure is sticky and that dropping MEFs is difficult once the firm initiates them. We lose 6151 (about 6%) of non-AA firm-quarter observations by applying this filter. The results (untabulated) are similar if we do not apply this filter to non-AA firm-quarter observations.

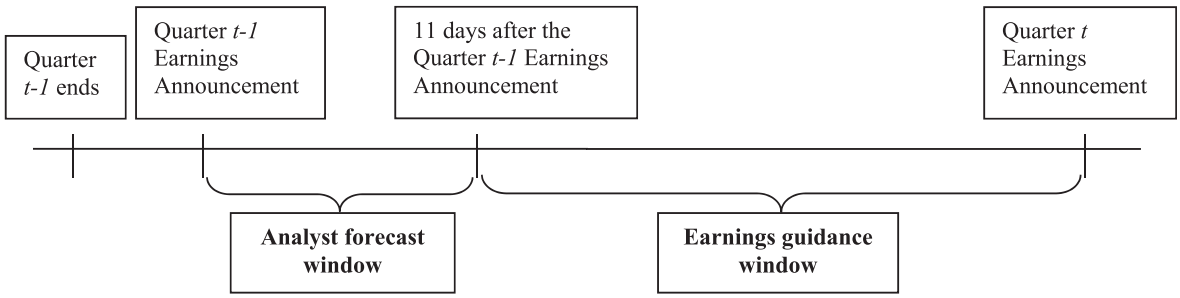

Fig. 1. Analyst forecast window and earnings guidance window.

quarters for which control variables are unavailable, our final sample consists of 88,628 firm-quarter observations, of which 38,480 are covered by at least one AA analyst.

3.2. Propensity-score matching

It is possible that firm-quarters covered by AA analysts are fundamentally different from other firm-quarters. To address this concern, we employ the propensity-score-matching approach. Specifically, we estimate the following Probit model.

$$\begin{aligned} AACovered_{i,t} = {} & \gamma_0 + \gamma_1\, InstPct_{i,t-1} + \gamma_2\, Following_{i,t-1} + \gamma_3\, RetVol_{i,t-1} + \gamma_4\, Size_{i,t-1} + \gamma_5\, ROA_{i,t} + \gamma_6\, Loss_{i,t} \\ & + \gamma_7\, AbnTvol_{i,t} + \gamma_8\, PersistentGuider_{i,t} + Industry\ dummies + Year\ dummies \end{aligned} \quad (1)$$

AA_Covered is an indicator variable that equals one if at least one AA analyst issues an earnings forecast for the current quarter in the analyst forecast window, and zero otherwise. Variables are defined in Appendix A. As explanatory variables for the coverage of AA analysts, we consider institutional ownership, analyst coverage, return volatility, firm size, profitability, loss occurrence, abnormal trading volume as a proxy for significant economic events, and an indicator for a persistent guider.[15] Untabulated results from univariate analyses indicate that the two groups are significantly different from each other in these variables. Industry and year fixed effects are also included. We match firm-quarters covered by AA analysts and those not covered by AA analysts based on the propensity score estimated from the above Probit model. We run all our analyses with the propensity-score-matched sample.

Table 1 reports the results of the Propensity-Score-Matching (PSM) procedure. Panel A reports the result of the Probit regression of AA analyst coverage on firm characteristics. In this table and all subsequent tables, we report z-statistics (and t-statistics for OLS regressions) based on standard errors adjusted for firm-clustering. Following prior studies (Matsumoto, 2002; Ajinkya et al., 2005; Field et al., 2005; Cotter et al., 2006; Brockman et al., 2008; Kim and Park, 2012), we also report log-likelihood ratio as a model-fit-statistics for this table and all other models with dichotomous dependent variables.[16] We find that the coefficient estimates of all determinants, except the coefficients on return volatility and ROA, are significant.

We construct a matched sample, as in Rosenbaum and Rubin (1983). Specifically, we match treatment observations (i.e., firm-quarters covered by AA analysts) with control observations (i.e., firm-quarters not covered by AA analysts) based on the propensity score (i.e., the probability of AA_Covered = 1), estimated in Panel A of Table 1. We apply nearest-neighbor matching without replacement and require the absolute difference in the propensity scores of matched observations to be below a pre-specified threshold (i.e., caliper distance). We successfully match 16,973 firm-quarters covered by AA analysts with their control group of firm-quarters not covered by AA analysts, leading to 33,946 observations for our main analyses. Panel B of Table 1 reports the result of testing for covariate balancing. The difference between the group of firm-quarters covered by AA analysts and their matched control group is insignificant for all explanatory variables used in the Probit regression of AA analyst coverage.

3.3. Test models

We estimate the following logistic regression to test H1.

$$\begin{aligned} MF_{i,t} = {} & \alpha_0 + \alpha_1\, AACovered_{i,t} + \alpha_2\, Optimism_{i,t} + \alpha_3\, InstPct_{i,t-1} + \alpha_4\, Following_{i,t-1} + \alpha_5\, RetVol_{i,t-1} \\ & + \alpha_6\, Size_{i,t-1} + \alpha_7\, ROA_{i,t} + \alpha_8\, Loss_{i,t} + \alpha_9\, Dispersion_{i,t-1} + \alpha_{10}\, AbnTvol_{i,t} + \alpha_{11}\, PersistentGuider_{i,t} \\ & + Industry\ dummies + Year\ and\ Quarter\ dummies \end{aligned} \quad (2)$$

[15] We do not include analyst-related variables (other than analyst following), such as forecast optimism and forecast dispersion, as determinants of AA analyst coverage, because it is more reasonable to think that these variables are influenced by the coverage of AA analysts, rather than the other way around.

[16] Log-likelihood ratio is a test of a full model with "intercept and covariates" against a reduced model with "intercept only." The larger magnitude of log-likelihood ratio leads to lower p-values for this test, which provides evidence against the reduced model in favor of the full model.

Table 1
Propensity score-matching (PSM).

Panel A: Probit model of AA coverage		
Explanatory variables	Coeff.	z-stat.
Inst_Pct	0.281***	4.53
Following	1.174***	36.47
Ret_Vol	0.803	0.98
Size	0.307***	24.31
ROA	−0.429	−1.44
Loss	0.163***	5.81
Abn_Tvol	0.055***	4.12
Persistent_Guider	0.082**	2.17
Industry Fixed Effect	Yes	
Year Fixed Effect	Yes	
N	88,628	
Log-likelihood Ratio	47519.7	

Panel B: Covariate balancing			
	Means of variables		
Explanatory variables	AA_Covered = 1	AA_Covered = 0	p-val.
Inst_Pct	0.694	0.693	0.853
Following	2.039	2.044	0.299
Ret_Vol	0.030	0.031	0.118
Size	20.780	20.760	0.173
ROA	0.003	0.002	0.280
Loss	0.239	0.243	0.395
Abn_Tvol	−0.121	−0.122	0.882
Persistent_Guider	0.176	0.182	0.198
N	16,973	16,973	

This table reports the Probit regression of AA analyst coverage on firm characteristics in Panel A and the means of firm characteristics for the group of firm-quarters covered by AA and for their matched group of firm-quarters not covered by AA as well as t-tests for the difference of means between the two groups in Panel B. All variables are defined in Appendix A. All continuous variables are winsorized at the 1% and 99%. All test statistics and significance levels are based on the standard errors adjusted for firm clustering. *, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

MF is an indicator variable that equals one if a firm issues at least one quarterly MEF in the earnings guidance window, and zero otherwise. If managers are more likely to issue quarterly MEFs when AA analysts are following the firm, we expect the coefficient on AA_Covered to be positive and statistically significant.

We control for factors known to affect managers' decision to issue MEFs. Cotter et al. (2006) show that MEFs are more likely when analysts' early consensus forecasts are optimistic. Ajinkya et al. (2005) find that firms with greater institutional ownership are more likely to issue MEFs, consistent with institutional investors demanding more disclosures. Lang and Lundholm (1996) and Ajinkya et al. (2005) find a positive relation between analyst following and management disclosures. Waymire (1984) suggests that riskier firms are less likely to provide MEFs. Kasznik and Lev (1995) provide evidence supporting a positive association between firm size and MEFs. Thus, we control for analyst forecast optimism, institutional ownership, analyst following, return volatility (a proxy for firm risk), and firm size.

Disclosure theories (e.g., Verrecchia, 1983) predict that only firms with performance exceeding a particular threshold will disclose. Consistent with this theory, Miller (2002) finds that disclosure is positively related to performance. Skinner (1994), however, argues that firms voluntarily disclose bad news to mitigate legal liability, implying a negative relation between voluntary disclosure and performance. Thus, the relation between the likelihood of MEFs and firm performance is unclear. We include return on assets (ROA) and a loss indicator to proxy for firm performance.[17]

wFeng et al. (2009) show that firms with harder-to-estimate earnings (measured by analyst forecast dispersion) are less likely to provide MEFs. Thus, we also include analyst forecast dispersion in the regression. To address a concern that managers might be more likely to issue guidance when there are more material economic activities in the event quarter, we control for abnormal trading volume measured over the quarter (Beaver, 1968; Landsman and Maydew, 2002; Landsman et al., 2012). In addition, considering that firms' long-term earnings guidance policies may influence MEF issuances, we control for each firm's earnings guidance policy by including a persistent guider indicator in the regressions (Bushee et al., 2003; Skinner, 2003). Following Houston et al. (2010) and Chen et al. (2011), we define firms that issue quarterly guidance in at least three out of four quarters during the past year as persistent guiders.[18] Industry, year, and quarter fixed effects are also included.

[17] Following prior studies (Ajinkya et al., 2005; Anantharaman and Zhang, 2011), we include ex-post measures of ROA and loss to proxy for managers' expectation about the firm's profitability. Our results are qualitatively the same if we replace quarter *t* ROA and the loss indicator with ROA and a loss indicator calculated based on the prevailing analyst consensus forecasts, as in Cotter et al. (2006).

[18] An alternative definition of persistent guider, which is set to one for firms that issue quarterly MEFs in at least seven out of eight quarters in the past two years, and zero otherwise, produces results similar to those tabulated.

In testing H2, we compare the influences of AA analysts' forecast optimism and non-AA analysts' forecast optimism on the likelihood of MEFs using the sample of firm-quarters that are covered by AA analysts. To test H2, we estimate the following logistic regression.

$$\begin{aligned} MF_{i,t} = {} & \beta_0 + \beta_1\ OptimismNonAA_{i,t} + \beta_2\ OptimismAA_{i,t} + \beta_3\ InstPct_{i,t-1} + \beta_4\ Following_{i,t-1} + \beta_5\ RetVol_{i,t-1} \\ & + \beta_6\ Size_{i,t-1} + \beta_7\ ROA_{i,t} + \beta_8\ Loss_{i,t} + \beta_9\ Dispersion_{i,t-1} + \beta_{10}\ AbnTvol_{i,t} + \beta_{11}\ PersistentGuider_{i,t} \\ & + Industry\ dummies + Year\ and\ Quarter\ dummies \end{aligned} \quad (3)$$

Optimism_NonAA is non-AA analysts' forecast optimism, measured by the mean consensus forecast of non-AA analysts in the analyst forecast window minus the actual earnings per share (EPS) for quarter t from I/B/E/S, scaled by the stock price at the beginning of quarter t. Similarly, we measure AA analysts' forecast optimism as the mean consensus forecast of AA analysts in the analyst forecast window, minus the actual EPS for quarter t from I/B/E/S, scaled by the stock price at the beginning of quarter t. Because the forecast optimism of non-AA analysts and that of AA analysts are highly correlated, which makes it difficult to interpret the regression results, we orthogonalize AA analysts' forecast optimism with respect to Optimism_NonAA. We use the orthogonalized value of AA analysts' forecast optimism, Optimism_AA, in the regression. Using the orthogonalized value, which is the residual from the regression of the raw values of AA analyst forecast optimism on Optimism_NonAA, helps isolate the incremental effect of AA analyst forecast optimism.[19]

4. Results

4.1. Descriptive statistics

Panel A of Table 2 shows the descriptive statistics for the sample of 33,946 firm-quarters, 16,973 firm-quarters covered by AA analysts and their control group of firm-quarters not covered by AA analysts, matched based on the PSM procedure. All continuous variables are winsorized at the top and bottom 1% to mitigate the influence of extreme values. Managers issue quarterly MEFs in 8.6% of quarters (or 2927 quarters out of 33,946 total firm-quarters). Analysts are optimistic in their forecasts, on average, as evidenced by the positive mean value (0.001) of Optimism, which is measured by the mean consensus forecast of all analysts in the analyst forecast window minus the actual EPS for quarter t, scaled by the stock price at the beginning of quarter t.[20] The mean institutional ownership is 69%; seven to eight analysts, on average, issue earnings forecasts in the analyst forecast window; and the mean return volatility is 3.0%. We use the natural logarithm of (one plus the number of analysts following a firm) instead of the raw number of analysts as a control variable in the regressions. The distribution of firm size is skewed, because the mean value of the market value of equity, $2778 million, is much greater than the median value, $1044 million. We use the natural logarithm of the market value of equity in the regressions. In our sample, firms are profitable, on average, and report a loss for about 24% of the quarters. The mean analyst forecast dispersion is about 20.7% for our sample firms. The abnormal trading volume has a negative mean value (−0.122). The mean value of Persistent_Guider shows that 17.9% of the firm-quarters are from firms that issue quarterly guidance in at least three out of four quarters during the past year.

Panel B of Table 2 reports Pearson correlation coefficients among variables. The incidence of quarterly MEFs is positively associated with AA analyst coverage. MF is also positively associated with analyst forecast optimism, consistent with Cotter et al. (2006).

4.2. AA analyst coverage and the likelihood of quarterly MEFs

Table 3, Panel A reports the results of the logistic regression of the incidence of MEFs on AA analyst coverage, using the PSM sample. The coefficient on AA_Covered is positive and statistically significant at the 5% level, indicating that firms are more likely to issue MEFs in quarters followed by reputable analysts compared with quarters not followed by reputable analysts. We also report the marginal effects, which are calculated as the change in the probability of issuing an earning guidance when the variable of interest changes from 0 to 1 for indicator variables (or by one standard deviation for continuous variables) and other variables are held at the corresponding means. AA analyst coverage is associated with a 0.5% increase in the likelihood of MEFs. Considering that firms issue quarterly MEFs in only 8.6% of firm-quarters in our sample, this marginal effect represents a 5.8% increase in the likelihood of MEFs from the sample mean, which is not trivial. Overall, the results in Panel A of Table 3 are consistent with H1.

[19] Early studies (e.g., Brown and Ball, 1967; Beaver et al., 1982) use a similar approach to circumvent the problem of multicollinearity. As we explain later in the paper, this approach yields the same inference of the coefficient on the orthogonalized variable, but provides a more conservative evaluation when we compare the coefficient on the orthogonalized variable and the coefficient on the other variable. The inferences remain the same if we use the raw values of AA analyst forecast optimism instead. That is, the coefficient on AA analyst forecast optimism is more positive than the coefficient on *Optimism_NonAA*, consistent with H2 (untabulated). The sign of the coefficient on *Optimism_NonAA*, however, changes from positive to negative if we replace *Optimism_AA* with the raw values of AA analyst forecast optimism, suggesting a multicollinearity problem in this specification (i.e., the specification using the raw values of AA analyst forecast optimism).

[20] The median value of optimism is 0. The difference between the mean and median values indicates that the distribution of analyst forecasts is right-skewed (i.e., the tail is longer in the optimism direction). Thus, we re-estimate our logistic regressions with the analyst forecast optimism measure based on the median value instead of the mean value of forecasts, and our main results remain largely the same with the alternative measure.

Table 2
Summary statistics.

Panel A: Descriptive statistics

Variable	N	Mean	STD	Q1	Median	Q3
MF	33,946	0.086	0.281	0.000	0.000	0.000
Optimism	33,946	0.001	0.021	−0.002	0.000	0.001
Optimism_NonAA	33,946	0.001	0.021	−0.002	0.000	0.001
Optimism_AA (raw)	16,973	0.001	0.016	−0.003	0.000	0.001
Inst_Pct	33,946	0.69	0.27	0.52	0.74	0.90
Following (raw number)	33,946	7.5	4.0	5.0	7.0	10.0
Ret_Vol	33,946	0.030	0.017	0.019	0.026	0.037
Size ($ million)	33,946	2778	8020	461	1044	2343
ROA	33,946	0.002	0.044	0.000	0.009	0.021
Loss	33,946	0.24	0.43	0.00	0.00	0.00
Dispersion	33,946	0.207	0.412	0.036	0.078	0.185
Abn_Tvol	33,946	−0.122	0.476	−0.420	−0.203	0.078
Persistent_Guider	33,946	0.179	0.383	0.000	0.000	0.000

Panel B: Pearson correlation coefficients

Variable		2	3	4	5	6	7	8	9	10	11	12	13	14
MF	1	0.01 (0.03)	0.02 (<0.01)	0.02 (<0.01)	0.02 (<0.01)	0.04 (<0.01)	0.04 (<0.01)	0.05 (<0.01)	−0.03 (<0.01)	0.01 (0.02)	0.00 (0.45)	−0.03 (<0.01)	0.03 (<0.01)	0.21 (<0.01)
AA_Covered	2		0.01 (0.04)	0.01 (0.12)	n/a n/a	0.00 (0.85)	−0.01 (0.30)	−0.01 (0.12)	−0.02 (<0.01)	0.01 (0.28)	0.00 (0.40)	0.03 (<0.01)	0.00 (0.88)	−0.01 (0.20)
Optimism	3			0.99 (<0.01)	0.88 (<0.01)	−0.03 (<0.01)	−0.02 (<0.01)	0.13 (<0.01)	−0.02 (<0.01)	−0.21 (<0.01)	0.21 (<0.01)	0.10 (<0.01)	0.00 (0.48)	−0.03 (<0.01)
Optimism_NonAA	4				0.82 (<0.01)	−0.03 (<0.01)	−0.02 (<0.01)	0.12 (<0.01)	−0.02 (<0.01)	−0.21 (<0.01)	0.21 (<0.01)	0.10 (<0.01)	0.00 (0.42)	−0.03 (<0.01)
Optimism_AA (raw)	5					−0.02 (0.01)	−0.03 (<0.01)	0.13 (<0.01)	−0.02 (<0.01)	−0.21 (<0.01)	0.23 (<0.01)	0.12 (<0.01)	0.00 (0.96)	−0.05 (<0.01)
Inst_Pct	6						0.16 (<0.01)	−0.10 (<0.01)	−0.19 (<0.01)	0.13 (<0.01)	−0.11 (<0.01)	−0.03 (<0.01)	0.02 (<0.01)	0.18 (<0.01)
Following	7							−0.03 (<0.01)	0.10 (<0.01)	0.04 (<0.01)	−0.06 (<0.01)	−0.07 (<0.01)	−0.04 (<0.01)	0.15 (<0.01)
Ret_Vol	8								−0.13 (<0.01)	−0.38 (<0.01)	0.41 (<0.01)	0.19 (<0.01)	0.02 (<0.01)	−0.03 (<0.01)
Size	9									0.11 (<0.01)	−0.11 (<0.01)	−0.05 (<0.01)	0.02 (<0.01)	−0.04 (<0.01)
ROA	10										−0.64 (<0.01)	−0.13 (<0.01)	0.07 (<0.01)	0.06 (<0.01)
Loss	11											0.28 (<0.01)	−0.07 (<0.01)	−0.06 (<0.01)
Dispersion	12												−0.04 (<0.01)	−0.08 (<0.01)
Abn_Tvol	13													−0.03 (<0.01)
Persistent_Guider	14													

This table provides summary statistics for the propensity-score-matched sample. Panel A reports descriptive statistics and Panel B reports Pearson correlations among variables. All variables are defined in Appendix A.

Turning to the control variables, we find that firms are more likely to issue quarterly MEFs when the consensus forecast is more optimistic, consistent with Cotter et al. (2006); when institutional ownership is greater, consistent with Ajinkya et al. (2005); when more analysts are following, consistent with Lang and Lundholm (1996) and Ajinkya et al. (2005); and when ROA is higher, consistent with Miller (2002). We find, however, that firms are more likely to issue MEFs when the return volatility is higher, which is inconsistent with the argument that risker firms are less likely to provide MEFs (Waymire, 1984). It is plausible that firms with more volatile earnings disclose more to mitigate litigation risks (Skinner, 1994). Firms are less likely to guide earnings when forecast dispersion is greater, consistent with Feng et al. (2009). The coefficient on firm size is unexpectedly negative, potentially due to a high correlation between analyst following and firm size, as well as our research design, which focuses on MEFs issued during the earnings guidance window. In an untabulated test, we find that firm size is positively correlated with the incidence of MEFs if we do not restrict MEFs to only those issued during the guidance window.[21] Finally, we find that firms are more likely to issue quarterly MEFs when there are more significant economic events during the quarter, and, not surprisingly, when the firms are persistent earnings guiders.

[21] We focus on earnings guidance during the guidance window, because we examine the managerial response to AA analyst forecasts issued earlier in the quarter. The correlation between analyst following and firm size is 0.45. Although this correlation is relatively high, the highest variance inflation factor (VIF) in our regressions is less than 2.0, which is much lower than the threshold level, 10.

Table 3
AA analyst coverage, AA analyst forecast optimism, and MEFs.

Panel A: AA analyst coverage and MEFs			
Explanatory variables	Coeff.	z-stat.	M.E.
AA_Covered	0.114**	2.17	0.005
Optimism	5.775***	6.99	0.007
Inst_Pct	0.617***	4.96	0.008
Following	0.364***	5.32	0.011
Ret_Vol	5.258***	2.73	0.004
Size	−0.060**	−2.27	−0.005
ROA	1.325*	1.78	0.003
Loss	−0.014	−0.18	−0.001
Dispersion	−0.169**	−2.34	−0.003
Abn_Tvol	0.378***	8.05	0.009
Persistent_Guider	1.286***	19.58	0.062
Industry Fixed Effect	Yes		
Year Fixed Effect	Yes		
Quarter Fixed Effect	Yes		
N	33,946		
Log-likelihood Ratio	3621.6		

Panel B: AA and non-AA analysts' optimism and MEFs				
Explanatory variables		Coeff.	z-stat.	M.E.
Optimism_NonAA	(β1)	4.754***	4.21	0.006
Optimism_AA	(β2)	17.680***	6.23	0.012
Inst_Pct		0.477***	3.00	0.006
Following		0.427***	4.58	0.013
Ret_Vol		5.680**	2.17	0.005
Size		0.001	0.04	0.000
ROA		0.839	0.81	0.002
Loss		−0.077	−0.68	−0.004
Dispersion		−0.093	−1.02	−0.002
Abn_Tvol		0.330***	4.91	0.008
Persistent_Guider		1.304***	15.22	0.064
F-test: β1 = β2		12.929***	21.21	
Industry Fixed Effect		Yes		
Year Fixed Effect		Yes		
Quarter Fixed Effect		Yes		
N		16,973		
Log-likelihood Ratio		1959.9		

This table reports the results from the logistic regression of the incidence of MEFs on AA analyst coverage in Panel A and on the extent of optimism in AA and non-AA analysts' forecast in Panel B using a propensity-score-matched sample. All other variables are defined in Appendix A. All continuous variables are winsorized at the 1% and 99%. All test statistics and significance levels are based on the standard errors adjusted for firm clustering. The marginal effect is calculated as the change in the probability of issuing an earning guidance when the variable of interest changes by one standard deviation (or from 0 to 1 for indicator variables) and other variables are held at the corresponding means.
*, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

4.3. Analyst forecast optimism and the likelihood of quarterly MEFs

Panel B of Table 3 reports the results from the logistic regression of the incidence of MEFs on AA analysts' forecast optimism and non-AA analysts' forecast optimism, using the PSM sample. We limit the sample to firm-quarters with at least one AA analyst following the firm, because AA analysts' forecast optimism is not defined for firm-quarters without any AA analyst following the firm.[22] We find that the coefficient on Optimism_AA is positive and statistically significant at the 1% level, suggesting that firms are more likely to issue quarterly MEFs when AA analysts' forecasts are more optimistic. The marginal effect of AA analysts' forecast optimism (i.e., Optimism_AA) is 1.2%, which represents a 13.9% increase from the sample mean (8.6%). While the coefficient on Optimism_NonAA is also significantly positive, the F-test shows that the coefficient on Optimism_AA is significantly more positive than the coefficient on Optimism_NonAA. This result is consistent with H2, suggesting

[22] Note that we compare the influences of AA analysts' forecast optimism and non-AA analysts' forecast optimism on the likelihood of MEFs. Alternatively, one may be interested in testing whether analysts' forecast optimism in general has a greater impact on the likelihood of MEFs when the firm is covered by AA analysts. Such a test requires a different research design and sample. Notably, one would not need to define AA analysts' forecast optimism and non-AA analysts' forecast optimism separately, but need to consider how AA analyst coverage might affect non-AA analysts' forecast optimism. While examining such an issue is interesting, it is beyond the scope of this study.

that managers' response to AA analysts' forecast optimism is significantly greater than that to non-AA analysts' forecast optimism.

As discussed earlier, we use the orthogonalized AA analysts' forecast optimism instead of the raw values to avoid multicollinearity problems and ease the interpretation of the regression results. Pearce and Reiter (1985) show that while this approach produces an identical estimate and standard error for the orthogonalized variable (i.e., Optimism_AA in our study) as those in the original regression model (i.e., the regression with Optimism_NonAA and the raw values of AA analyst forecast optimism), it yields a biased coefficient on the other variable. That is, the coefficient on Optimism_NonAA is biased upward if we use the orthogonalized values of AA analyst forecast optimism. The F-test, however, indicates that the coefficient on Optimism_AA is more positive than even the biased-upward estimate of the coefficient on Optimism_NonAA. Therefore, we can conclude that even when we use this conservative approach, the results are consistent with H2: that AA analysts' forecast optimism is more positively associated with the likelihood of MEFs than non-AA analysts' forecast optimism.[23]

4.4. Robustness tests

We run a series of tests to check the robustness of our results. First, we examine whether our main results are robust to alternative definitions of AA analyst coverage and forecast optimism. For the test of H1, we replace AA_Covered with AA_Ratio, which is defined as the proportion of AA analysts over all analysts who follow a firm in quarter t. The result is reported in the first column of Table 4. The coefficient on AA_Ratio is positive and significant at the 10% level, suggesting that the propensity to issue quarterly MEFs increases in the proportion of AA analysts among all analysts covering the firm. This result is consistent with that reported in Table 3, Panel A. For the test of H2, we replace Optimism_AA and Optimism_NonAA, with Optimism and High_AA_Optimism, and the interaction of these two variables, where High_AA_Optimism is defined as one if AA analysts' forecast optimism is greater than non-AA analysts' forecast optimism, and zero otherwise. The results are shown in the second column of Table 4. As predicted, the coefficient estimate of Optimism*High_AA_Optimism is positive and significant at the 1% level, suggesting that the positive relation between the likelihood of MEFs and analyst forecast optimism is more pronounced when AA analysts' forecast optimism is greater than non-AA analysts' forecast optimism.

Second, we conduct several additional sensitivity tests. We re-estimate our logistic regressions after including firm fixed effects to address the concern that time-invariant unobservable firm characteristics might drive the results. An estimation with both firm fixed effects and time fixed effects allows a within-firm comparison between quarters covered by AA analysts and those not covered by AA analysts. We obtain the same inferences from the firm fixed effects model (untabulated for brevity). We also test whether our choice of the analyst forecast window and the earnings guidance window influences the results by employing two alternative analyst forecast windows: (i) between the quarter t − 1 earnings announcement and two weeks before the end of quarter t, and (ii) from the quarter t − 1 earnings announcement and ending 45 days after the quarter t − 1 earnings announcement date.[24] The untabulated results are consistent with those reported in Table 3.

Several earlier studies (e.g., Rogers and Stocken, 2005) exclude management forecasts issued after the fiscal period end, because they consider these management forecasts as pre-announcements of earnings rather than forecasts. Consistent with Cotter et al. (2006), Baik and Jiang (2006), and Feng et al. (2009), however, we do not exclude pre-announcements, because such MEFs contribute to expectations management. Nevertheless, we re-estimate our logistic regressions after eliminating MEFs issued on or after the fiscal quarter end. Untabulated results are qualitatively the same as those reported in Table 3.

4.5. Endogeneity

In Panel A of Table 3, we show that AA coverage is positively associated with the likelihood of MEFs and interpret the result to mean that AA analyst coverage influences voluntary disclosure practice. The causality, however, may flow in the opposite direction. That is, it is possible that AA analysts decide to follow a firm when it provides more information. In this section, we address this endogeneity challenge in two ways: by examining the initiation or drop of AA analyst coverage and by conducting a quasi-natural experiment based on the change in an analyst's AA status. We also combine these change analyses with a PSM approach to conduct difference-in-differences (DiD) tests. We recognize that firms that experience an AA analyst coverage change or an AA analyst status change may be fundamentally different from other firms that do not expe-

[23] We also estimate the logistic regression as in Table 3 for the subsamples of firm-quarters with optimistic and pessimistic analyst forecasts separately. The tenor of the untabulated results with the subsample of optimistic analyst forecasts is similar to that of the results in Panel B of Table 3. In the subsample of pessimistic analyst forecasts, the coefficient on *Optimism_AA* is negative, and this coefficient is more negative than the coefficient on *Optimism_NonAA*, suggesting that managers attempt to adjust not only overly optimistic AA analyst forecasts but also overly pessimistic AA analyst forecasts. As the overall results in Panel B of Table 3 are similar to those with optimistic analyst forecasts, but are different from those with pessimistic forecasts, the subsample of firm-quarters with optimistic forecasts clearly drives our results in Panel B of Table 3. The optimistic analyst forecasts dominate, even though firm-quarters with optimistic analyst forecasts account for only 38% of all firm-quarters. This happens because managers are more likely to issue MEFs when analyst forecasts are optimistic than when they are pessimistic. Managers issue MEFs in 11.8% of firm-quarters with optimistic analyst forecasts (1511 of 12,823 firm-quarters), while they issue MEFs in only 6.7% of firm-quarters with pessimistic analyst forecasts (1360 of 20,324 firm-quarters).

[24] The corresponding earnings guidance window starts from two weeks before the end of quarter *t* (or on day 46 for the second alternative) and ends one day before the quarter *t* earnings announcement date. Because AA analyst coverage is defined differently depending on the choice of the analyst forecast window, we conduct PSM again for each choice of analyst forecast windows and construct different sets of PSM samples for the hypotheses testing.

Table 4
Robustness tests using alternative measurements of AA analyst coverage and forecast optimism.

	Model (1)		Model (2)	
Explanatory variables	Coeff.	z-stat.	Coeff.	z-stat.
AA_Ratio	0.308*	1.74		
Optimism	5.770***	7.00	1.001	0.77
Optimism*High_AA_Optimism			15.171***	4.31
High_AA_Optimism			−0.083	−1.33
Inst_Pct	0.616***	4.95	0.454***	2.87
Following	0.388***	5.54	0.418***	4.53
Ret_Vol	5.217***	2.70	6.364**	2.40
Size	−0.063**	−2.35	0.000	−0.01
ROA	1.311*	1.77	0.580	0.56
Loss	−0.017	−0.21	−0.062	−0.55
Dispersion	−0.167**	−2.31	−0.082	−0.91
Abn_Tvol	0.378***	8.03	0.327***	4.85
Persistent_Guider	1.284***	19.53	1.298***	15.21
Industry Fixed Effect	Yes		Yes	
Year Fixed Effect	Yes		Yes	
Quarter Fixed Effect	Yes		Yes	
N	33,946		16,973	
Log-likelihood Ratio	3618.5		1957.0	

This table reports the results of robustness test using an alternative measurements of AA analyst coverage and forecast optimism. All variables are defined in Appendix A. All continuous variables are winsorized at the 1% and 99%. All test statistics and significance levels are based on the standard errors adjusted for firm clustering. *, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

rience such changes. Thus, we apply PSM for AA analyst coverage changes and AA analyst status changes separately and construct a separate propensity-score matched sample for each event. We then examine the effect of AA analyst coverage initiation, discontinuation, and AA analyst status changes on the incidence of MEFs.

First, we examine whether the initiation (drop) of coverage by AA analysts leads to a higher (lower) likelihood of quarterly MEFs. Panel A of Table 5 reports the results.[25] In Column (1), we examine 3790 firm-quarters that are not covered by AA analysts in quarter t − 1 but are covered by AA analysts in quarter t, with their matched control group of firm-quarters not covered by AA analysts in both quarters. We test whether the likelihood of quarterly MEFs increases from quarter t − 1 to quarter t when at least one AA analyst initiates coverage in quarter t. Post_Period equals zero for quarter t − 1 and one for quarter t. As we include both quarters t − 1 and t of event and control firms, the number of observations in the test is 15,160 (=3790 × 2 × 2). In Column (1), an indicator variable Change_AA_Coverage equals zero if no AA analyst issues earnings forecasts in both quarter t − 1 and quarter t, and one if no AA analyst issues a forecast in quarter t − 1 but at least one AA analyst initiates coverage in quarter t. We interact Change_AA_Coverage with Post_Period. The coefficient on the interaction of Change_AA_Coverage and Post_Period captures the difference-in-differences in the likelihood of MEFs. We find that the coefficient on Change_AA_Coverage*Post_Period is positive and statistically significant, suggesting the positive effect of AA analyst coverage initiation on the propensity of issuing MEFs.[26]

In Column (2) of Panel A, we focus on 4326 firm-quarters that are covered by AA analysts in quarter t − 1 but dropped from AA analyst coverage in quarter t. We also utilize matched control firm-quarters that are covered by AA analysts in both quarters for the difference-in-differences test. Accordingly, the indicator variable Change_AA_Coverage is now set to zero if at least one AA analyst issues earnings forecasts in both quarter t − 1 and quarter t, and one if at least one AA analyst issues forecasts in quarter t − 1 but no AA analyst covers the firm in quarter t. We also interact Change_AA_Coverage with Post_Period. We find that the coefficient on Change_AA_Coverage*Post_Period is negative and statistically significant, suggesting the negative effect of AA analyst coverage discontinuation on the likelihood of MEFs. The results in Panel A of Table 5 are consistent with the notion that AA analyst coverage influences a firm's voluntary disclosure strategy, reinforcing the findings in Panel A of Table 3.

[25] Untabulated results from the test of covariate balancing confirm that the treatment groups and control groups are similar in all explanatory variables used in the Probit regressions of AA analyst coverage changes and AA analyst status changes.

[26] The coefficient on *Change_AA_Coverage* in Column (1) is significantly negative, suggesting that treatment firms are less likely to issue MEFs prior to the AA analyst coverage initiation. This is not consistent with a possible scenario in which AA analysts may decide to follow a firm when it provides more information, mitigating a reverse causality concern. Similarly, the significantly positive coefficient on *Change_AA_Coverage* in Column (2), representing AA coverage discontinuation, suggests that the firms that are covered by AA analysts in quarter *t-1* and experience the cessation of AA analyst coverage in quarter *t* are more likely to issue MEFs in quarter *t-1*. Again, this result is not consistent with the possibility that AA analysts would stop following a firm when it provides less information.

Table 5
Tests using changes of AA analyst coverage and analyst status.

Panel A: Initiation or drop of AA analyst coverage

(Changes of AA Analyst Coverage =)	Initiation of AA analyst coverage (1)			Drop of AA analyst coverage (2)		
Explanatory variables	Coeff.	z-stat.	M.E.	Coeff.	z-stat.	M.E.
Change_AA_Coverage	−0.461***	−3.23	−0.017	0.335***	2.98	0.019
Post_Period	−0.004	−0.03	0.000	0.171*	1.71	0.010
Change_AA_Coverage*Post_Period	0.372**	1.98	0.014	−0.539***	−3.62	−0.031
Optimism	2.682	1.42	0.003	8.420***	4.44	0.012
Inst_Pct	0.556**	2.21	0.006	0.458**	2.13	0.007
Following	0.414***	2.75	0.009	0.397***	3.11	0.014
Ret_Vol	9.599**	2.13	0.006	0.198	0.05	0.000
Size	−0.096	−1.56	−0.006	−0.045	−0.94	−0.004
ROA	1.527	1.04	0.003	2.342	1.61	0.006
Loss	0.300*	1.77	0.011	0.184	1.21	0.010
Dispersion	−0.041	−0.26	−0.001	−0.234	−1.49	−0.006
Abn_Tvol	0.182*	1.66	0.003	0.115	1.20	0.003
Persistent_Guider	1.450***	11.15	0.054	1.293***	11.50	0.073
Industry Fixed Effect	Yes			Yes		
Year Fixed Effect	Yes			Yes		
Quarter Fixed Effect	Yes			Yes		
N	15,160			17,304		
Log-likelihood Ratio	838.7			1012.6		

Panel B: Analyst status change from non-AA to AA or from AA to non-AA

(AA Status Change =)	From non-AA to AA analyst (1)			From AA to non-AA analyst (2)		
Explanatory variables	Coeff.	z-stat.	M.E.	Coeff.	z-stat.	M.E.
Change_AA_Status	−0.063	−0.18	−0.003	−0.533	−1.29	−0.020
Post_Period	−0.578	−1.51	−0.032	−0.427	−0.87	−0.017
Change_AA_Status*Post_Period	0.996**	2.29	0.055	0.421	0.80	0.015
Optimism	0.906	0.14	0.001	22.112***	2.88	0.025
Inst_Pct	1.115*	1.72	0.017	−0.937	−1.29	−0.012
Following	0.519	1.60	0.017	0.073	0.13	−0.003
Ret_Vol	−0.243	−0.02	0.000	−0.399	−0.03	0.000
Size	−0.038	−0.29	−0.004	−0.023	−0.17	0.003
ROA	−4.090	−1.19	−0.010	8.271	1.37	0.014
Loss	0.461	1.42	0.025	0.525	1.09	0.021
Dispersion	−0.338	−1.37	−0.008	−0.086	−0.28	−0.002
Abn_Tvol	0.267	1.02	0.007	0.144	0.40	0.001
Persistent_Guider	1.296***	4.50	0.071	2.248***	6.80	0.102
Industry Fixed Effect	Yes			Yes		
Year Fixed Effect	Yes			Yes		
Quarter Fixed Effect	Yes			Yes		
N	1272			812		
Log-likelihood Ratio	200.8			175.6		

This table reports the results from the logistic regression of the incidence of MEFs on the changes of AA analyst coverage in Panel A and on the changes of AA status in Panel B. In Panel A, the event of interest (Change_AA_Coverage) is the AA coverage initiation in Column (1) and the AA coverage discontinuation in Column (2), respectively. Panel B, the event of interest (Change_AA_Status) is the analyst status change from a non-AA to an AA analyst in Column (1) and from an AA to a non-AA analyst in Column (2), respectively. Panel A is based on PSM samples that are obtained from the Probit regression of AA coverage initiation and AA coverage discontinuation, respectively. Panel B is based on PSM samples that are obtained from the Probit regression of the change of the analyst status from a non-AA to an AA analyst and from an AA to a non-AA analyst, respectively. The logistic regression is estimated using the two quarters t − 1 and t, where quarter t is the quarter during which a change of AA analyst coverage (i.e., either initiation or drop of coverage) takes places in Panel A and during which an analyst status change (i.e., either from a non-AA to an AA analyst and from an AA to a non-AA analyst) takes places in Panel B. Post_Period equals one for quarter t, and zero for quarter t − 1. All other variables are defined in Appendix A. All continuous variables are winsorized at the 1% and 99%. All test statistics and significance levels are based on the standard errors adjusted for firm clustering. The marginal effect is calculated as the change in the probability of issuing an earning guidance when the variable of interest changes by one standard deviation (or from 0 to 1 for indicator variables) and other variables are held at the corresponding means. *, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

Table 6
AA and non-AA analysts' forecast optimism and MEF properties.

Dependent variable =	Forecast news		Forecast bias		Forecast revision	
	(1)		(2)		(3)	
Explanatory variables	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	z-stat.
Optimism_NonAA (β1)	−0.119	−1.40	0.307***	2.61	7.865***	2.60
Optimism_AA (β2)	−0.754***	−4.13	−0.555*	−1.73	50.008***	4.17
Inst_Pct	−0.004*	−1.84	−0.003	−1.50	0.162	0.67
Ret_Vol	−0.019	−0.50	0.013	0.24	0.252*	1.77
Size	0.000	0.90	0.000	−0.57	5.927	1.47
ROA	−0.006	−0.26	−0.064**	−1.98	0.144**	2.58
Loss	−0.003**	−2.45	0.001	0.54	0.725	0.45
Dispersion	−0.003***	−3.38	−0.003**	−2.32	0.402**	2.39
Abn_Tvol	0.001	1.28	−0.001	−0.49	0.230*	1.67
Persistent_Guider	−0.001	−0.29	−0.005	−0.91	0.387***	3.68
IMR	−0.002	−0.29	−0.009	−0.89	−0.064	−0.63
F-test: β1 = β2	−0.636**	6.47	−0.862**	4.74	42.144***	11.72
Industry Fixed Effect	Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes	
Quarter Fixed Effect	Yes		Yes		Yes	
N	1345		1345		3486	
Adjusted R^2	0.2841		0.1217		–	
Log-likelihood Ratio	–		–		589.7	

This table reports the results from the analyses of MEF properties. The dependent variables are earnings forecast news (MF_News), earnings forecast bias (i.e., MF_Bias) and earnings forecast revision (MF_Revision), respectively. All other variables are defined in Appendix A. All continuous variables are winsorized at the 1% and 99%. All test statistics and significance levels are based on the standard errors adjusted for firm clustering. *, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

To further address the endogeneity concern, we utilize an event that potentially changes perceptions about an analyst's reputation.[27] We examine cases where the same analyst follows the firm in both quarter t − 1 and quarter t, but her/his status changes from non-AA to AA (from AA to non-AA) in quarter t, because the analyst is newly listed in (dropped from) II's AA rankings. We test whether quarterly MEFs in quarter t are more (less) likely when analysts change their status from non-AA to AA (from AA to non-AA). Because the same analyst has been covering the firm, the relation between the incidence of MEFs and the change in the analyst's status in quarter t cannot be explained by an analyst's making a coverage choice as a response to MEFs. Thus, we can better establish the direction of causality (i.e., from AA analyst coverage to voluntary disclosure practice, and not the other way around). Panel B of Table 5 reports the results.

In Column (1), we examine 318 firm-quarters that are not covered by any AA analyst in quarter t − 1 but are covered by at least one AA analyst in quarter t only because the analyst who covers the firm in quarter t − 1 is newly listed in II's AA rankings. We also utilize matched control firm-quarters that are not covered by AA analysts in both quarter t − 1 and quarter t for the difference-in-differences test. As in Panel A of Table 5, we use the difference-in-differences research design and include both the event firm-quarters with an analyst status change from non-AA to AA and the control firm-quarters without such a change. In this analysis, we include only firm-quarters where all analysts following the firm in quarter t − 1 are non-AA analysts. Accordingly, Change_AA_Status in Column (1) equals one if a non-AA analyst in quarter t − 1 becomes an AA analyst in quarter t, and zero otherwise. We interact Change_AA_Status with Post_Period. We find that the coefficient on Change_AA_Status*Post_Period is positive and statistically significant, suggesting the positive effect of analyst reputation on the propensity to issue MEFs. This result reinforces the conclusion that AA analyst coverage influences a firm's voluntary disclosure strategy.

In Column (2) of Panel B, we examine 203 firm-quarters that are covered by AA analysts in quarter t − 1 but are not covered by any AA analyst in quarter t, only because the AA analyst who covers the firm in quarter t − 1 is dropped from II's AA rankings. We also utilize matched control firm-quarters that are covered by AA analysts in both quarters for the difference-in-differences test. That is, we include both the event firm-quarters with analyst status changes from AA to non-AA and the control firm-quarters without such changes. In turn, Change_AA_Status equals one if an AA analyst in quarter t − 1 becomes a non-AA analyst in quarter t, and zero otherwise. We find that the coefficient on Change_AA_Status*Post_Period is insignificant. The insignificant impact of the status change from AA to non-AA on the incidence of MEFs may reflect difficulties in changing perceptions about once-reputable analysts. Arguably, it is more difficult to change perceptions about once-reputable analysts when their names are dropped from the most recent ranking than to change perceptions about

[27] The change of an analyst's status, either from non-AA to AA or from AA to non-AA, is unlikely to be influenced by an individual firm's disclosure practice to a large extent, because AA rankings are determined based on an individual analyst's overall performance (i.e., based on forecasts, investment recommendations, and research reports, not just for one individual firm but for all firms that the individual analyst covers).

Table 7
Coverage and forecast optimism of alternative measures of analyst reputation and MEFs.

Reputable Analysts =	General experience				Brokerage size				Prior forecast accuracy			
	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)		Model (6)	
Explanatory Variables	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
RA_Covered	0.088**	2.09			0.019	0.40			0.071	1.48		
Optimism	6.646***	8.41			7.069***	8.26			9.929***	6.70		
Optimism_NonRA (γ1)			5.222***	5.61			6.534***	5.44			13.373***	6.85
Optimism_RA (γ2)			11.253***	5.51			20.230***	7.14			63.298***	9.59
Inst_Pct	0.415***	3.66	0.285**	2.07	0.559***	4.74	0.515***	3.41	0.361**	2.41	0.626***	3.37
Following	0.361***	5.81	0.407***	5.44	0.315***	4.63	0.257***	2.92	0.280***	2.92	0.262**	2.23
Ret_Vol	4.983***	2.92	3.109	1.34	4.760**	2.51	3.703	1.44	4.217	1.63	3.619	1.03
Size	0.018	0.69	0.023	0.83	0.002	0.06	0.022	0.65	0.077**	2.25	0.112***	2.73
ROA	0.836	1.33	0.368	0.41	1.260*	1.72	1.473	1.47	−0.134	−0.14	−1.066	−0.83
Loss	0.076	1.09	0.061	0.62	0.128	1.64	0.077	0.73	0.021	0.21	−0.055	−0.39
Dispersion	−0.137**	−2.21	−0.196**	−2.26	−0.243***	−3.28	−0.232**	−2.28	−0.215**	−2.06	−0.122	−0.75
Abn_Tvol	0.396***	10.51	0.425***	7.95	0.377***	8.88	0.289***	4.66	0.334***	6.45	0.403***	5.61
Persistent_Guider	1.440***	25.20	1.365***	19.46	1.331***	19.49	1.369***	16.93	1.512***	20.92	1.529***	17.02
F-test: γ1 = γ2			6.031***	9.77			13.697***	20.94			49.925***	59.43
Industry Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes	
Quarter Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes	
N	47,462		23,731		35,296		17,648		28,020		14,010	
Log-likelihood Ratio	5909.8		2986.0		4057.4		2105.2		4150.2		2111.5	

This table reports the results from the logistic regression of the incidence of MEFs on coverage of alternative measures of reputable analysts (RA) and their forecast optimism and other analysts' (Non-RA) forecast optimism using a propensity-score-matched sample. Reputable analysts are defined as those analysts who are in the top decile group of the analyst sophistication distribution based on three different measures: (i) general experience in Models (1) and (2), (ii) brokerage size in Models (3) and (4), and (iii) prior period forecast accuracy in Models (5) and (6). General experience of an analyst is measured as the number of quarters since the analyst first appeared in the I/B/E/S database. Brokerage size is measured as the number of analysts who work for a brokerage in the quarter. Prior forecast accuracy of an analyst is measured as the average of the forecast accuracy for the past four quarters. Optimism_RA is the orthogonalized forecast optimism of RA with respect to forecast optimism of Non-RA, which is measured as the residuals from the regression of raw values of reputable analysts' forecast optimism on Optimism_NonRA. All other variables are defined in Appendix A. All continuous variables are winsorized at the 1% and 99%. All test statistics and significance levels are based on the standard errors adjusted for firm clustering. *, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

non-AA analysts when their names are newly added to the ranking. Alternatively, the insignificant results could be due to managers' delayed reaction in shaping the voluntary disclosure strategy.[28]

4.6. Bundled guidance

We note that "bundled guidance" (i.e., a management forecast issued concurrently with an earnings announcement) has increased significantly in recent years. Because we focus on management forecasts issued later in the quarter, we omit a large amount of guidance. We are, however, interested in managers' response to analysts' forecast optimism and whether this response is driven by managers' incentive to meet or beat market expectations. Therefore, including bundled forecasts in our setting is problematic.

The underlying motives for issuing management forecasts during the earnings announcement (i.e., issuing bundled guidance or bundled forecasts) are different from those for issuing forecasts later in the quarter. Rogers and Van Buskirk (2013) suggest that bundled forecasts increase dramatically following Reg. FD's enactment because firms use conference calls more often as channels to issue bundled forecasts and to publicly respond to analysts' questions about management forecasts than before. Cotter et al. (2006) conduct an analysis based on shorter horizon management forecasts (i.e., issued within 30 days before earnings announcement) because the management has a better idea about the actual earnings when the timing of management forecasts is closer to the earnings announcement. Such forecasts better capture the managers' incentive to guide analysts toward beatable earnings targets. In examining whether managers use their earnings forecasts to dampen

[28] In unreported analyses, we examine the event samples only (i.e., AA analyst coverage initiation, discontinuation, and AA analyst status changes from non-AA to AA analyst or from AA to non-AA analyst). The results are consistent with those reported in Table 5. That is, firms are more (less) likely to issue MEFs after AA analysts initiate coverage (AA analysts discontinue coverage) and that firms are more likely to issue MEFs after analysts who follow the firms change their status from non-AA to AA, while there is no significant impact of the status change from AA to non-AA.

Table 8
Market reactions to Meeting or Missing AA and Consensus Forecasts.

	Model (1)		Model (2)		Model (3)	
Explanatory Variables	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
MBE	0.032***	12.10	0.039***	19.40		
MBE_AA	0.008***	3.10				
MBE & MISS_AA (δ1)			−0.015***	−4.14	0.024***	6.19
MISS & MBE_AA			0.002	0.49		
MBE & MBE_AA (δ2)					0.039***	20.25
Surprise	0.217***	2.83	0.222***	2.89	0.224***	2.93
Size	0.004***	4.15	0.004***	4.13	0.004***	4.13
Ret_Vol	0.367***	5.03	0.367***	5.03	0.367***	5.03
BM	0.007**	2.37	0.007**	2.35	0.007**	2.34
Loss	−0.013***	−5.53	−0.013***	−5.54	−0.013***	−5.57
Intercept	−0.120***	−5.33	−0.119***	−5.27	−0.118***	−5.26
F-test: δ1 = δ2					0.015***	17.10
N	16,812		16,812		16,812	
Adjusted R^2	0.0545		0.0548		0.0549	

This table reports the results from the OLS regression of earnings announcement returns on meeting (missing) AA analyst forecasts and consensus forecasts. The dependent variable is the three-day cumulative abnormal returns around the earnings announcement date [−1, +1] for quarter t (CAR), where daily abnormal returns are measured as the firm's daily return minus the daily return of the value-weighted index. MBE is an indicator variable that equals one if the actual EPS for quarter t is greater than or equal to the mean analyst consensus forecasts, and zero otherwise. MBE_AA is an indicator variable that equals one if the actual EPS for quarter t is greater than or equal to AA analyst forecasts, and zero otherwise. MBE & MISS_AA is an indicator variable that equals one if the actual EPS for quarter t is greater than or equal to the mean analyst consensus forecasts, and at the same time, the actual EPS is less than AA analyst forecasts, and zero otherwise. MISS & MBE_AA is an indicator variable that equals one if the actual EPS for quarter t is less than the mean analyst consensus forecasts, and at the same time, the actual EPS is greater than or equal to the AA analyst forecasts, and zero otherwise. MBE & MBE_AA is an indicator variable that equals one if the actual EPS for quarter t is greater than or equal to both the mean analyst consensus forecasts and AA analyst forecasts, and zero otherwise. All other variables are defined in Appendix A. All continuous variables are winsorized at the 1% and 99%. All test statistics and significance levels are based on the standard errors adjusted for firm clustering. *, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

analysts' expectations, Baik and Jiang (2006) keep the management forecast issued closest to the earnings announcement in those firm-quarters where managers issue multiple forecasts. Although the authors do not explicitly explain the reason for their choice, it is consistent with the assumption that management forecasts issued closer to the earnings announcement allow managers to have a better idea about actual earnings and therefore can better guide analysts toward beatable earnings targets. Finally, Kim and Park (2012) suggest that the incentive for expectations management (i.e., guiding down market expectations toward beatable earnings targets) would be greater as the earnings-announcement date approaches. Consistent with this prediction, they find that the fraction of management forecasts issued with the expectations-management incentive is greater for forecasts issued later in the quarter than for those issued earlier in the quarter. Thus, the prior literature suggests that the underlying motives for issuing bundled forecasts and those for issuing forecasts later in the quarter (or closer to the earnings announcement) are different from each other, and management forecasts issued closer to the earnings announcement better reflect managers' incentive to guide market expectation toward beatable earnings targets.

One concern is that firms that issue bundled forecasts and those that do not issue bundled forecasts might be fundamentally different from each other and managers' decision to issue bundled forecasts may affect their decision to use management forecasts for the expectations-management. For example, firms that issue bundled forecasts may be less likely to issue management forecasts later in the quarter. We address this endogeneity challenge using two different approaches.

First, we estimate the likelihood of issuing bundled forecasts and estimate the inverse Mills ratio from this model. We then include the inverse Mills ratio in the main regressions to control for the potential selection bias. Second, we include an indicator variable for issuing a bundled forecast at the time of the announcement of prior quarter earnings as an additional control variable in the main regression. Untabulated results show that our main results are robust to addressing endogeneity concerns through two alternative approaches. That is, the coverage of AA analysts is positively associated with the likelihood of quarterly MEFs, and AA analysts' forecast optimism is more positively associated with the likelihood of MEFs than non-AA analysts' forecast optimism. These results mitigate the concern that our results are significantly affected by biases arising from the treatment of bundled forecasts.[29]

[29] We acknowledge, however, that the inferences from our results are limited to management forecasts issued later in the quarter, but not to management forecasts bundled with earnings announcements.

5. Additional analyses

5.1. AA analysts' early forecast optimism and properties of MEFs

While managers decide whether to issue MEFs in response to analysts' forecast optimism, they also have discretion in shaping various properties of management forecasts. To provide broader insights on the effects of individual analysts' reputation on voluntary disclosure practice, we examine the relations between AA analysts' early forecast optimism and management forecast properties, such as news, bias, and revisions of management forecasts.[30]

Although managers do not entirely control the news that their forecasts convey, they effectively can exert such control via decisions about whether to issue an earnings forecast, and if so, which earnings number to forecast (Hirst et al., 2008). The news conveyed by a forecast falls into one of the three categories: good-news forecasts, which exceed prevailing market expectations; bad-news forecasts, which fall short of these expectations; and confirming forecasts, which corroborate those expectations (e.g., Anilowski et al., 2007; Kim and Shi, 2011). If managers issue quarterly MEFs to guide reputable analysts' forecasts downward, they are likely to issue guidance with more negative news when AA analysts' forecasts are more optimistic. That is, we expect a negative relation between AA analysts' early forecast optimism and earnings forecast news.

Managers often use their guidance to walk-down market earnings expectations (Bergman and Roychowdhury, 2008; Cotter et al., 2006; Matsumoto, 2002). For example, managers may intentionally issue pessimistic forecasts that, in turn, cause market participants to revise their expectations downward. As AA analysts' forecasts are influential, managers are likely to issue pessimistic forecasts to walk-down AA analysts' forecasts, especially when these analysts are overly optimistic. Reputation costs, however, may prevent managers from intentionally biasing their forecasts.

Nagar et al. (2003) show that managers strategically choose the frequency of MEFs. They argue that managers with higher levels of equity-based compensation issue more frequent forecasts to avoid equity mispricing, which could adversely affect their wealth. They find evidence consistent with this argument. As managers have incentives to deflate analysts' initial optimism (Bartov et al., 2002; Matsumoto, 2002; Richardson et al., 2004), they are more likely to update their earlier forecasts when analysts' forecasts are overly optimistic. Considering the greater influence of AA analysts in the market, we expect that the positive relation between analysts' early forecast optimism and the likelihood of MEF revisions is more prominent for AA analysts than for non-AA analysts.

To test the predictions on MEF properties, we estimate the following regression.

$$\begin{aligned}\text{MEF Property}_{i,t} = {} & \delta_0 + \delta_1\ \text{OptimismNonAA}_{i,t} + \delta_2\ \text{OptimismAA}_{i,t} + \delta_3\ \text{InstPct}_{i,t-1} + \delta_4\ \text{RetVol}_{i,t-1} \\ & + \delta_5 Size_{i,t-1} + \delta_6 ROA_{i,t} + \delta_7 Loss_{i,t} + \delta_8 Dispersion_{i,t-1} + \delta_9 Abn_T vol_{i,t} + \delta_{10} Persistent_G uider_{i,t} \\ & + \delta_{11} IMR_{i,t} + Industrydummies + YearandQuarterdummies \end{aligned} \quad (4)$$

MEF Property is MF_News, MF_Bias, or MF_Revision. MF_News is calculated as MEF for quarter t minus the analyst mean consensus forecast, divided by the stock price at the beginning of quarter t. MF_Bias is calculated as MEF for quarter t minus the actual EPS for quarter t, divided by the stock price at the beginning of quarter t. MF_Revision is an indicator variable that equals one if a firm issues at least one MEF in the earnings guidance window after issuing at least one MEF in the analyst forecast window, and zero otherwise. More detailed definitions of these variables are presented in Appendix A. Because providing MEFs is voluntary, the analyses of MEF properties may be subject to self-selection bias. To control for this bias, we use a Heckman (1979) two-stage model, following Feng et al. (2009). We estimate the Probit model of the likelihood of MEFs using equation (2). Following Feng et al. (2009), we use analyst coverage as an instrumental variable in the first-stage Probit model.[31] The Inverse Mills Ratio (IMR) calculated from the first-stage Probit model is included in the second-stage regressions. Finally, to test MEF revisions, we estimate equation (3) after limiting the test sample to those firm-quarters in which managers already issue at least one MEF in the analyst forecast window.

Table 6 reports the results of testing the relation between AA analysts' early forecast optimism and MEF news, MEF bias, and MEF revisions.[32] In Column (1), we examine the relation between AA analysts' early forecast optimism and MEF news. Consistent with our prediction, we find that guidance news is negatively associated with AA analysts' forecast optimism, suggesting that MEF news is more negative when AA analysts' forecasts are more optimistic. The F-test indicates that the coefficient on Optimism_AA is significantly more negative than even the biased-downward estimate of the coefficient on Optimism_NonAA.[33] These results sug-

[30] Since it is ex-ante unclear how analyst reputation affects MEF properties, we do not develop formal hypotheses for the tests in this section. Please note that we develop our prediction on the relation between AA analyst coverage and the incidence of MEF based on disclosure theories (e.g., Dye, 1985; 1998). Our prediction on the relation between AA analyst forecast optimism and the incidence of MEFs is built on prior empirical evidence on the influence of AA analysts. In contrast, no theory or prior empirical evidence guides us in predicting the relation between analyst reputation and other MEF properties, such as forecast news, bias, and frequency.

[31] Feng et al. (2009) argue that while analyst coverage affects the incidence of management earnings forecasts, it is not related to management forecast accuracy. As analyst coverage is used as an instrumental variable, it is omitted from the second-stage regressions.

[32] The number of observations in columns (1) and (2) of Table 6 is smaller than the total number of firm-quarters with MEFs and AA coverage, because we eliminate the firm-quarters for which we cannot calculate earnings forecast news and bias, as MEFs are either qualitative or open-ended. We calculate earnings forecast news and bias only for point and range guidance. The number of observations in column (3) of Table 6 is smaller than that in Table 3, because we limit the test sample to those firm-quarters in which managers already issue at least one MEF in the analyst forecast window.

[33] As the efficient on *Optimism_NonAA* in Panel B of Table 3 is biased upward because the raw values of AA analyst forecast optimism are replaced by the orthogonalized values (Pearce and Reiter, 1985), the coefficient on *Optimism_NonAA* in column (1) (column (3)) of Table 6 is biased downward (upward).

gest that when analyst forecasts are optimistic, managers are likely to guide down analysts' earnings expectations; this tendency is more pronounced when optimistic analysts are AA analysts than when optimistic analysts are non-AA analysts.

One concern is that MEF news and analysts' forecast optimism are mechanically associated, because both variables have the analyst consensus forecast in their calculations. To mitigate any potential bias arising from this mechanical relation, we also estimate the MEF news model using ordered Logit. Specifically, we transform MEF news into a discrete variable that takes the value of −1 for bad news, 0 for neutral news, and 1 for good news. Untabulated results from these ordered Logit regressions are qualitatively similar to those based on OLS regressions.[34]

Column (2) reports the results of testing the relation between AA analysts' early forecast optimism and MEF bias. Results show that AA analysts' early forecast optimism is negatively associated with management forecast bias, suggesting that managers issue more pessimistic forecasts to walk-down AA analysts' optimistic forecasts. The F-test indicates that the relation between forecast optimism and MEF bias is more negative for AA analysts than for non-AA analysts. To gain more insights on the influence of individual analyst heterogeneity on MEF frequency, we examine the relation between MEF revisions and AA analysts' early forecast optimism and report the results in Column (3). We limit the sample to firm-quarters that have at least one MEF issued in the analyst forecast window and examine the likelihood of MEF revision in the earnings guidance window. Consistent with our prediction, AA analysts' early forecast optimism is positively associated with the likelihood of MEF revision in the guidance window. F-tests show that the relation between AA analysts' early forecast optimism and the likelihood of MEF revision is more positive than the relation between non-AA analysts' early forecast optimism and the likelihood of MEF revision.

5.2. Alternative proxies for analyst reputation and the likelihood of quarterly MEFs

So far, we employ Institutional Investor magazine's AA rankings to test our hypotheses on the relation between analyst reputation and incidence of MEFs, because the AA ranking encompasses various dimensions of analyst quality. As mentioned earlier, however, prior studies also consider various analyst and/or forecast characteristics to identify prominent or more influential analysts (e.g., Clement, 1999; Mikhail et al., 1997; Bonner et al., 2007). Thus, we examine whether other dimensions of analyst characteristics, which are potentially associated with their reputation, are related to firms' voluntary disclosure practice.

In this section, we define reputable analysts based on three commonly used measures of analyst competencies: (i) analysts' general experience, (ii) brokerage size, and (iii) past forecast accuracy. Analysts' general experience is measured as the number of quarters since the analyst first appeared in the I/B/E/S database.[35] Brokerage size is measured as the number of analysts who work for a brokerage in the quarter. Analyst's prior forecast accuracy is measured as the average forecast accuracy for the past four quarters. We classify an analyst as reputable if she/he belongs to a top decile of these three alternative reputation measures in each quarter and the industry group. Then, we measure the coverage and forecast optimism of reputable analysts, as well as the forecast optimism of non-reputable analysts, in the same way that we measure those for AA and non-AA analysts. Specifically, RA_Covered is an indicator variable that equals one if at least one reputable analyst (defined separately based on three different alternative measures of analyst reputation) issues an earnings forecast for the current quarter in the analyst forecast window, and zero otherwise. Optimism_NonRA (raw Optimism_RA) is measured by the mean consensus forecast of non-reputable analysts (reputable analysts) in the analyst forecast window minus the actual EPS for quarter t from I/B/E/S, scaled by the stock price at the beginning of quarter t. Then, we estimate the logistic regression models (2) and (3) after replacing AA_Covered, Optimism_NonAA, and Optimism_AA with RA_Covered, Optimism_NonRA, and Optimism_RA.[36]

Table 7 reports the results. Reputable analysts are defined based on analysts' general experience in Models (1) and (2), brokerage size in Models (3) and (4), and prior forecast accuracy in Models (5) and (6). While the coefficient on RA_Covered is significantly positive in Model (1), it is insignificant in Models (3) and (5). We find more consistent results on the relation between reputable analysts' forecast optimism and the likelihood of MEFs. In all three models (i.e., Models (2), (4), and (6)), the coefficient on Optimism_RA is significantly positive and more positive than the coefficient on Optimism_NonRA. These results suggest that managers are more responsive to reputable analysts' forecast optimism than other analysts' forecast optimism. The inferences from these results are generally consistent with those from our main results based on AA status as the measure of analyst reputation.[37]

[34] We tabulate the results based on OLS, because a nonlinear model, such as the ordered Logit in the second stage of the Heckman two-stage model, may result in inconsistent parameter estimates (Das et al., 2011).

[35] Analysts' firm specific experience is not a suitable measure in our context, because we want to define analyst reputation such that it applies to all analysts, and not to the specific firm she/he follows.

[36] As in the main test (Table 3), we use the orthogonalized forecast optimism of reputable analysts with respect to the forecast optimism of non-reputable analysts in the regressions.

[37] We also conduct additional analyses based on the "key analyst" measure (Kirk et al. 2014) as an alternative proxy for reputable analysts, with a modification. That is, after calculating the raw composite analyst scores, following Kirk et al. (2014), we standardize individual analysts' scores to make them comparable across firms. Because the group of individual analysts who follow a firm is influenced by firm characteristics, the raw composite analyst score for each firm might be affected by firm-specific factors. Therefore, we subtract the mean composite score for each firm from the raw composite analyst score and scale it by the standard deviation for each firm. Then, we consider an analyst as a key analyst if the individual analyst is in the top decile of the standardized composite score distribution at each quarter. Untabulated results show that while the coverage of key analysts is not significantly associated with the issuance of MEFs, key analysts' forecast optimism has a stronger positive impact on the likelihood of MEFs than non-key analysts' forecast optimism, which is consistent with our main results for H2. The insignificant coverage result may reflect the difficulty of defining reputable analysts in a way that applies to all firms based on the composite analyst score. Although we standardize the composite analyst scores to make them comparable across firms, our approach may not completely eliminate the influence of firm-specific factors.

5.3. Earnings announcement returns to meeting AA analyst forecasts

We reason that managers are more responsive to AA analysts' forecast optimism than non-AA analysts' forecast optimism when their firms are covered by AA analysts because meeting/beating AA analysts' forecasts has a greater consequence than meeting/beating non-AA analysts' forecasts. While prior studies already provide evidence suggesting that AA analysts are more influential than other analysts (Stickel, 1992; Gleason and Lee, 2003; Loh and Stulz, 2011) and that markets react differently to AA analysts' forecasts, in this section, we examine differential market reactions to meeting/beating AA analysts' forecasts using our sample firms. That is, we seek to provide evidence that validates our underlying premise that market penalties at the time of earnings announcements are greater for missing AA analysts' forecasts than for missing non-AA analysts' forecasts.

Table 8 reports the results of estimating an OLS regression model where the dependent variable is the three-day cumulative abnormal returns around the earnings announcement date [−1, +1] for quarter t (CAR). We employ several indicator variables (i) to identify the quarterly earnings announcements in which the actual reported earnings meet/beat the consensus forecasts, and (ii) to distinguish between meeting/beating AA analyst forecasts and missing AA analyst forecasts. In Model (1), MBE (MBE_AA) is an indicator variable for meeting/beating the consensus forecasts (AA analyst forecasts). The significantly positive coefficient on MBE_AA indicates that there is a premium to meeting/beating AA analyst forecasts. This additional positive return for meeting/beating AA analyst forecasts is obtained after controlling for the well-established market premium to meeting/beating the consensus forecasts at the quarterly earnings announcements, as evidenced by the significantly positive coefficient on MBE.

In Model (2), we include MBE and two indicators for meeting and missing AA analyst forecasts. MBE & MISS_AA is an indicator variable for meeting/beating the consensus forecasts and missing AA analyst forecasts, while MISS & MBE_AA is an indicator variable for missing the consensus forecasts and meeting/beating the AA analyst forecasts. Thus, the benchmark group consists of firms that miss both the consensus forecast and the AA analyst forecasts. The intercept captures the returns to the benchmark group. The results show that the coefficient on MBE & MISS_AA is significantly negative, suggesting that there is a penalty (i.e., an incremental negative market reaction) for missing the AA analyst forecasts at the quarterly earnings announcements. The insignificant coefficient on MISS & MBE_AA suggests that there is no market reaction to meeting/beating the AA analyst forecasts if the firm misses the consensus forecast.

In Model (3), we directly compare meeting/beating and missing AA analyst forecasts, conditional on meeting/beating the consensus forecast. MBE & MBE_AA is an indicator variable for meeting/beating both the consensus forecast and the AA analyst forecasts. While the coefficients on both MBE & MISS_AA and MBE & MBE_AA are significantly positive, the F-test at the bottom of table indicates that the former is significantly smaller than the latter. In sum, the results in Table 8 support our argument that meeting/beating AA analysts' forecasts has a greater consequence than meeting/beating those of other analysts, motivating managers to guide down AA analysts' optimistic forecasts by issuing MEFs.

6. Conclusion

Despite an abundance of evidence that analysts are not homogeneous, prior studies rarely consider the possibility that managers consider the reputation of individual analysts in their voluntary disclosure decisions. Using II's AA rankings as a proxy for analyst reputation, this paper finds evidence that managers shape voluntary disclosure practice by taking into account the reputation of individual analysts following their firms.

We find that firms followed by AA analysts are more likely to issue quarterly MEFs than firms not followed by AA analysts. We also find that AA analysts' forecast optimism is more positively associated with the likelihood of MEFs than non-AA analysts' forecast optimism when the firm is covered by AA analysts. The analyses based on AA analysts' coverage change and status change provide evidence that supports the argument that AA analyst coverage influences the voluntary disclosure practice, and not the other way around. To provide broader insights on the relation between individual analysts' reputation and voluntary disclosure practice, we also examine various properties of MEFs. We find that MEF news and bias are more negative when AA analysts' early forecasts are more optimistic. We also find that managers are more likely to update MEFs issued earlier in the quarter when AA analysts' early forecasts are more optimistic.

Our study contributes to the literature on analyst research by extending the concept of analyst heterogeneity to the voluntary disclosure setting. We also add to the voluntary disclosure literature by providing evidence that the reputation of individual analysts following a firm influences the firm's decision to provide quarterly MEFs, as well as the properties of these forecasts.

There is one caveat in our analysis of MEFs issued in the earnings guidance window. "Bundled guidance" (i.e., a management forecast issued concurrently with an earnings announcement) has increased significantly in recent years. Because we are interested in managers' response to analysts' forecast optimism to meet or beat market expectations and bundled forecasts are issued for reasons other than benchmark beating/meeting, we exclude bundled forecasts from our analyses. Nonetheless, we acknowledge a caveat of omitting a large number of MEFs, and thus, the results of this study should be interpreted with some caution.

Appendix A. Variable definitions

Variable	Definition
MF	Indicator variable that equals one if a firm issues at least one management earnings forecast (MEF) over the period from 12 days after the quarter t − 1 earnings announcement date to the quarter t earnings announcement date, and zero otherwise.
MF_News	News from MEF, calculated as MEF for quarter t minus the analyst mean consensus forecast as of 11 days after the quarter t − 1 earnings announcement date, divided by the stock price at the beginning of quarter t. Guidance news is calculated based on point and range guidance only. For the range guidance, the midpoint of the range is used.
MF_Bias	Forecast bias of an MEF, calculated as MEF for quarter t minus the actual EPS for quarter t, scaled by the stock price at the beginning of quarter t. Forecast bias is calculated based on point and range guidance only. For the range guidance, the midpoint of the range is used.
MF_Revision	Indicator variable for management earnings forecast revision, which is defined only for firms that issue at least one management earnings forecast (MEF) over the analyst forecast window (i.e., from the quarter t − 1 earnings announcement date to 11 days after the quarter t − 1 earnings announcement date). MF_Revision equals one if a firm issues at least one management earnings forecast (MEF) over the earnings guidance window (i.e., from 12 days after the quarter t − 1 earnings announcement date to the quarter t earnings announcement date), and zero otherwise.
AA_Covered	Indicator variable that equals one if quarter t is covered by All-American (AA) analysts, and zero otherwise. We define AA analysts as those who are ranked at any positions including 'runner up' ranking in the previous year. A quarter is considered as being covered by AA analysts if at least one AA analyst issues an earnings forecast for the quarter
Optimism	Optimism level of analyst consensus forecast as of 11 days after the quarter t − 1 earnings announcement date. This variable is measured as the mean consensus forecast minus the actual EPS for quarter t, scaled by the stock price at the beginning of quarter t.
Optimism_NonAA	Optimism level of non-AA analysts' forecasts as of 11 days after the quarter t − 1 earnings announcement date. This variable is calculated in the same way as Optimism is calculated except that the consensus is based on non-AA analysts' forecasts only.
Optimism_AA (raw)	Optimism level of AA analysts' forecasts as of 11 days after the quarter t − 1 earnings announcement date. This variable is calculated in the same way as Optimism is calculated except that the consensus is based on AA analysts' forecasts only.
Optimism_AA	Orthogonalized AA analysts' forecast optimism with respect to non-AA analysts' forecast optimism, measured as the residual from the regression of Optimism_AA (raw) on Optimism_NonAA.
Change_AA_Coverage	Indicator variable representing either AA coverage initiation or AA coverage discontinuation. For the AA coverage initiation case, indicator variable equals one if a firm was not covered by AA analysts in the previous quarter (i.e., quarter t − 1) but is newly covered by AA analysts in quarter t, and zero otherwise. For the AA coverage discontinuation case, indicator variable equals one if a firm was covered by AA analysts in the previous quarter (i.e., quarter t − 1) but is not covered by AA analysts in quarter t, and zero otherwise.
Change_AA_Status	Indicator variable representing either analyst status changes from a non-AA to an AA analyst or analyst status changes from an AA to a non-AA analyst. For the case where analyst status changes from a non-AA to an AA analyst, indicator variable equals one if a firm is covered in both quarter t − 1 and quarter t by an analyst whose status changes from non-AA analyst in the previous quarter (i.e., quarter t − 1) to AA analyst in the current quarter t, and zero otherwise. For the case where analyst status changes from an AA to a non-AA analyst, indicator variable equals one if a firm is covered in both quarter t − 1 and quarter t by an analyst whose status changes from AA analyst in the previous quarter (i.e., quarter t − 1) to non-AA analyst in the current quarter t, and zero otherwise.
AA_Ratio	The proportion of AA analysts over all analysts who follow a firm in quarter t.
High_AA_Optimism	Indicator variable that equals one if the optimism level of AA analysts' forecasts (Optimism_AA) is greater than that of non-AA analysts' forecasts (Optimism_NonAA) for a firm, and zero otherwise

Appendix (*continued*)

Variable	Definition
Inst_Pct	Institutional ownership at the beginning of quarter t, measured as the fraction of total shares outstanding held by institutional investors.
Following	Analyst coverage, measured as the number of analysts who follow a firm in quarter t. The natural logarithm of (one plus analyst coverage) is used in the regressions.
Ret_Vol	Return volatility calculated as the standard deviation of daily stock return measured over a six-month period ending one month before the actual earnings announcement for quarter t.
Size	Market value of equity, calculated as the price multiplied by the number of common shares outstanding as of the beginning of quarter t. The natural logarithm of the market value of equity is used in the regressions.
ROA	Return on Assets for quarter t, calculated as Income Before Extraordinary Items (IBQ) divided by Total Assets (ATQ).
Loss	Indicator variable that equals one if a firm reports a loss (based on IBQ) for quarter t, and zero otherwise.
Dispersion	Analyst forecast dispersion, calculated as the standard deviation of analyst forecast for quarter t divided by the absolute value of the mean consensus forecast at the beginning of quarter t.
Abn_Tvol	The median daily abnormal trading volume over quarter t (from one day after the earnings announcement date for quarter $t-1$ to the earnings announcement date for quarter t), where daily abnormal trading volume is calculated as a firm's daily trading volume minus the average of daily trading volume, scaled by the standard deviation of daily trading volume; the average and the standard deviation of daily trading volume are calculated over the one-year period ending at one-month prior to the earnings announcement date for quarter $t-1$.
Persistent_Guider	Indicator variable that equals one if a firm issues a management earnings forecast (MEF) at least three times out of the previous four quarters (i.e., from quarter $t-4$ to $t-1$), and zero otherwise. This variable is measured using all MEFs issued during the entire period of quarter (i.e., MEFs made not only during the earnings guidance window but also during the analyst forecast window).
IMR	Inverse Mills Ratio, calculated from a Probit regression of the incidence of MEFs on AA analyst coverage and other control variables.
CAR	The three-day cumulative abnormal returns around the earnings announcement date [−1, +1] for quarter t, where daily abnormal returns are measured as the firm's daily return minus the daily return of the value-weighted index.
Surprise	Earnings surprise for quarter t, measured as the actual EPS for quarter t minus the mean consensus forecast as of two weeks prior to the end of quarter t, scaled by the stock price at the beginning of quarter t.
BM	Book-to-market ratio, measured as book value of common equity divided by the market value of equity at the beginning of quarter t.

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