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Earnings conference calls and information asymmetry among investors: the effect of heterogeneity in analyst questions

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ABSTRACT We examine the association between heterogeneity in analysts' questions during earnings conference calls (ECCs) and investor information asymmetry. Using a dataset of U.S. ECC transcripts from 2007 to 2020, we construct five measures of question heterogeneity capturing variation in the volume of questions, analysts' tone, thematic diversity, linguistic dissimilarity, and analyst turnover. Greater question heterogeneity is associated with higher unexplained trading volume, our proxy for investor information asymmetry. We attribute this to increased information processing costs, allowing investors with higher processing ability to transform public information into private advantages. Consistently, the association between analyst question heterogeneity and investor disagreement grows when processing burdens are higher, such as following negative earnings surprises or in firms with low institutional ownership. Conversely, it weakens when analysts revise forecasts positively in real time and when managers address a broader range of topics or engage in casting analyst participation. Our analyses control for firm-, analyst-, and call-level characteristics, including lagged unexplained trading volume; our main findings are robust to alternative specifications and are not readily explained by the alternative mechanisms we test. Our results highlight the complex role of analyst interactions during ECCs and suggest that more heterogeneous questions, while informative, can also exacerbate disparities in investor interpretation.

Keywords: Analyst heterogeneity; earnings conference call; textual analysis; information asymmetry; information processing costs

1. Introduction

We investigate how analyst questions during the Q&A sessions of earnings conference calls (ECCs) influence information asymmetry among investors. Specifically, we examine whether greater variation in the content and linguistic framing of these questions may complicate the

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information environment for investors. We argue that while such heterogeneity can enhance the informational value of ECCs, it may also increase the level of cognitive effort and other resources required to interpret and incorporate the information into prices. This can exacerbate disparities in investors' information sets, as it allows investors with lower information interpretation costs to turn public information into private information advantages.

ECCs are significant corporate disclosure events, enabling timely and stakeholder-driven communication with firms (Bowen *et al.*, 2002; Davis *et al.*, 2015; Kimbrough, 2005; Matsumoto *et al.*, 2011). The introduction of regulatory requirements for transparency and fair disclosure (e.g. Regulation Fair Disclosure), alongside the rise of social media and digital communication channels, has transformed ECCs into central information dissemination channels with broad investor reach. In particular, the Q&A session allows investors to observe analysts' real-time processes of information acquisition and discovery, providing many, especially retail investors, with a rare, low-cost opportunity to access pertinent information that they would not otherwise acquire independently.

Ample research has established the high informational content of ECCs.¹ While the vast majority of literature studying analyst contributions during ECCs focuses on their information acquisition strategies and their impact on average investor informedness, we shift the focus to how analyst questions influence the variation of informedness among investors. An increase in public information does not guarantee that investors become uniformly informed or reach consensus about firm valuation. As Blankespoor and Marinovic (2020) note, even public information entails significant processing costs, which include: (1) awareness costs (identifying the existence of information), (2) acquisition costs (retrieving the information), and (3) integration costs (interpreting and incorporating information into valuations). Variation in the level of these costs across investors can lead to information asymmetry.

Prior literature supports the existence of all three types of processing costs (Booker *et al.*, 2023; Gomez, 2024; Hirshleifer & Teoh, 2003; Israeli *et al.*, 2021) and these costs are often correlated (Blankespoor *et al.*, 2019; Blankespoor & Marinovic, 2020). For instance, Gomez (2024) finds that while the introduction of the EDGAR system reduced acquisition costs, it simultaneously increased information asymmetry by raising integration costs. In the context of ECCs, the framing and content of analyst questions convey important signals about their information set and their assessment of firm value. The more heterogeneous the analyst questions, the broader the set of signals to investors but also the higher the cost of integrating those signals into value.

Consider, for instance, the following two examples. The first consists of the following consecutive analyst questions from Noah Education Holdings Ltd. for Q4 of 2011:

*A1: Jerry, did I get you right that you said that you expect to be **profitable** both in fiscal first quarter and fiscal year '12?*

*A1: Great, good to know. And for the full year of FY '12, could you share some color in terms of what **profitability** or what **margins** you are expecting*

A2: Just a follow-up what's the profitability of your LNS and Wentai for this quarter or maybe for fiscal 2011?

A2: Okay. So standalone these two segments are basically profitable?

¹For instance, Matsumoto *et al.* (2011) and J. V. Chen *et al.* (2018) show that significant stock price movements often occur during the Q&A session, suggesting that both analyst questions and the elicited managerial responses convey price-relevant information (Barth *et al.*, 2023; Hollander *et al.*, 2010; J. Lee, 2016; Rennekamp *et al.*, 2022). Haag *et al.* (2023) and Allee *et al.* (2025) further find that investor reactions are more pronounced when analyst questions prompt managers to deviate from their prepared remarks, thereby generating new information. Notably, investors appear to extract signals not only from the content of Q&A exchanges but also from their linguistic features. Prior literature documents investor sensitivity to humour (Call *et al.*, 2021), extreme language (Bochkay *et al.*, 2020) and deception cues (Larcker & Zakolyukina, 2012), as well as tonal cues from both managers and analysts (Allee & Deangelis, 2015; Mayew *et al.*, 2020; Mayew & Venkatachalam, 2012; Price *et al.*, 2012).

The second example includes the following consecutive analyst questions from Alcoa Corp's ECC for Q1 2017:

*A1: And then shifting over to **third-party** I guess **shipments and sales** it looks like Alumina and Aluminum were relatively stable quarter-over-quarter and it looks like Bauxite third-party sales **were down about a little over 20% quarter-over-quarter**. Just curious if you could just touch on what's driving that?*

*A2: Could you describe **the eight locations in addition to the headquarters** where you streamlined it seems like a very sweeping organizational change?*

*A3: Just on uses of **free cash flow**. Is there a point at which your **leverage sort of gets low enough that capital return becomes a more active conversation?** I realize that pension funding and return-seeking capital are important. But assuming those two are satisfied is there sort of a target leverage level at which the capital return discussion becomes more pronounced?*

Each question in the examples above signals different aspects of the analyst's information set and valuation focus. In the first example, the analysts' questions are narrowly centred on a single theme related to profitability, probing expected margins and segment-specific performance. In contrast, the three questions in the second example cover three distinct topics – sales dynamics, corporate restructuring, and capital structure – thereby providing a wider range of signals. This heterogeneity in analyst questions increases the informational value of the Q&A session by expanding the scope of publicly available information and lowering investors' information acquisition costs. Allee et al. (2025) and Haag et al. (2023) provide empirical support for this effect, showing that the increase in value signals when analyst questions deviate from management's prepared narratives is associated with stronger investor reactions.

However, increased heterogeneity also imposes costs. As the volume and variety of signals grow in the second example, so does the complexity of processing and evaluating them. Integration costs rise as investors must assess each signal's relevance and credibility. These assessments are complicated by the fact that analyst questions are shaped not only by skill and genuine attempts to uncover new insights (Allee et al., 2025; Haag et al., 2023) but also by career motivations such as building rapport with management (Haag et al., 2023; Mayew et al., 2020), attracting or appeasing current and prospective employers (Harford et al., 2019), or differentiating themselves from peer analysts (J. V. Chen et al., 2018; Haag et al., 2023). To the extent that investors differ in their ability to process and integrate these signals, we expect a positive association between analyst question heterogeneity and information asymmetry, despite the potential increase in total public information.

We investigate the association between analyst question heterogeneity and investor information asymmetry by analysing a sample of 64,253 quarterly ECC transcripts from 3176 unique U.S.-listed firms for the period 2007–2020. We employ five measures of analyst question heterogeneity. First, we use the number of questions raised. To the extent that the questions are not entirely repetitive, a greater number of questions should capture a wider range of interests. Second, we examine the variation in analysts' tone. With this proxy we aim to capture differing levels of analysts' scepticism that are transmitted through the framing rather than the content of the questions. Third, we use the variation in their thematic focus to capture differences in the topics raised by analysts. Fourth, following Allee et al. (2025) we calculate the questions' linguistic uniqueness, which captures variation in wording. Lastly, we employ the number of new analysts participating in the ECC to capture the fresh perspectives brought by analysts with less experience with the firm and the peer analysts' group. Following Garfinkel (2009), we use unexplained trading volume, measured as the change in the daily market-adjusted percentage of shares traded as a proxy for investor opinion divergence. We interpret this divergence as a result of information asymmetry, where differences in investors' processing abilities lead to varying levels of informedness and ultimately to diverging valuations (Blankespoor & Marinovic, 2020).

We find that greater dispersion in analysts' questioning is associated with higher unexplained trading volume, our proxy for investor information asymmetry, across all five distinct

measures of question heterogeneity employed. The economic magnitudes are meaningful, with one-standard-deviation increases in heterogeneity corresponding to increases in trading volume of between 2.6% to 7.7% relative to the sample mean. These findings are consistent with heterogeneous analyst questions increasing investors' information processing costs and thereby amplifying differences in interpretation. We further examine the conditions under which this association is more or less pronounced to shed light on the underlying information-processing channel. The association between analyst question heterogeneity and investor disagreement is weaker following strong earnings surprises and in firms with high institutional ownership, settings in which signals are clearer or investors face lower interpretation costs.

In additional analysis, we examine the potential role of managers in mitigating the association between analysts' question heterogeneity and investor information asymmetry. We find that managers can mitigate the effects of question-related heterogeneity by addressing a wide range of topics in their responses, potentially reconciling analysts' views and clarifying the importance and relevance of the issues raised. Managers' efforts to control the narratives through question casting also yield similar results, attenuating the impact of analyst question heterogeneity. Finally, we test whether analysts themselves can moderate the effect of heterogeneity in their questions by summarising the results of the ECCs into potentially more homogeneous forecasts. We find that, when positive forecast revisions on the same day as the ECC dominate, the association between question heterogeneity and investor information asymmetry is attenuated. In contrast, when forecast revisions are predominantly negative, integration costs and investor information asymmetry appear to increase further.

While our results provide robust evidence of an empirical association between heterogeneity in analysts' questions during ECCs and subsequent investor information asymmetry, we acknowledge that they do not conclusively establish a causal relationship. As with much of the empirical literature in this area, a key concern is that analyst behaviour may reflect differences in firms' information environments, complexity, or news content, which could independently affect information asymmetry among investors. To address these concerns, we subject our main findings to a battery of robustness tests aimed at mitigating alternative interpretations related to firm characteristics or correlated information shocks. First, we confirm the robustness of our results using firm fixed effects, which account for time-invariant firm complexity. Second, we perform a placebo test to mitigate the possibility that our results are influenced by inherent firm complexity present even outside the ECC window. When we examine unexplained trading volume five days prior to the call, we find no significant effects, suggesting that our findings are specific to the information environment created by the call. Third, we confirm the robustness of our findings by using an alternative measure of investor disagreement that accounts for the amount of new information reflected in price movements. Fourth, we repeat our main analysis for a subsample of ECCs held on a different date than the earnings announcement, thereby mitigating concerns that the trading activity around the call is mechanically driven by the earnings release itself. We find results that are qualitatively similar to our main findings. Fifth, we repeat our analysis on a subsample of firms for which we expect low complexity based on size, sales growth, and the market-to-book ratio. Our results confirm that they hold for this set of firms. Sixth, our findings remain consistent when we match firms based on reporting complexity and on the linguistic characteristics of managerial speech during the introductory section of the ECC. Taken together, our robustness tests, while not entirely ruling out alternative explanations, suggest that analyst question heterogeneity captures aspects of analyst behaviour beyond firm-fundamental complexity and the broader information environment.

Our study extends three strands of research. First, we build upon research on the capital market consequences of ECCs. A large body of theoretical and empirical work has examined how markets respond to corporate disclosures, particularly around earnings announcements and ECCs

(Kandel & Pearson, 1995; Kim & Verrecchia, 1997; Kimbrough, 2005; Matsumoto et al., 2011). These studies document significant stock price reactions and trading volume spikes around ECCs (S. Brown et al., 2004; J. V. Chen et al., 2018; Matsumoto et al., 2011; Price et al., 2012), linking these market outcomes to the high informativeness of ECCs. S. Brown et al. (2004), for example, associate ECCs with reduced information asymmetry. Our study extends this literature by showing that, while ECCs generally improve the public information set, they may also result in higher investment information asymmetry when differential interpretation costs are amplified by analyst question heterogeneity.

Second, we contribute to the literature on the role of equity analysts in the price discovery process. Much of the existing ECC literature that focuses on the Q&A session tends to treat analysts as a homogeneous group, emphasising the analyst–manager dynamic. In contrast, we shift our attention to heterogeneity among analysts themselves. While prior research has begun to explore variation in analyst questions (Allee et al., 2025; Call et al., 2021; Haag et al., 2023; Mayew, 2008), our work contributes to this emerging stream with a distinct focus. Two recent studies are particularly relevant, Allee et al. (2025) and Haag et al. (2023). They examine the determinants of variation in question wording, or ‘uniqueness’, which they associate with thematic divergence. These studies find that factors such as analyst experience, access to resources, and incentives to appease managers or manage peer competition shape the uniqueness of the questions. Consistent with their hypothesis that question uniqueness enhances information production and lowers investors’ information acquisition costs, they further show that price reactions are stronger when analysts ask questions that diverge from the content of managerial introductions. Both studies focus on how analysts’ information acquisition strategies improve the average informativeness of public disclosures. In contrast, our study examines how variation among analyst questions can increase the cognitive burden on investors asymmetrically, thereby exacerbating information asymmetry. This alternative perspective also helps reconcile the seemingly contradictory findings in Allee et al. (2025), which show that question uniqueness relative to managerial discussion increases the informativeness of the Q&A session while uniqueness across analyst questions appears to reduce it. In addition to the distinct focus of our work, we adopt a conceptually broader definition of analyst question variation. Whereas Allee et al. (2025) and Haag et al. (2023) examine word-level (dis)similarity, we define heterogeneity as variation in both topical content and linguistic framing, reflecting the distinction between information derived from content and verbal cues to which investors respond to during ECCs.

Third, we contribute to research on the information processing costs of investors. As noted by Blankespoor and Marinovic (2020), despite improved access to information through digital platforms, social media, and AI-driven tools, investors continue to face substantial frictions in processing public information. We confirm this argument. Prior work typically focuses on individual components of these frictions – that is, awareness, acquisition, or integration costs – in isolation. A notable exception is Gomez (2024), who finds that while the EDGAR system reduced acquisition costs, it exacerbated integration frictions and, consequently, increased information asymmetry. Our study extends this perspective by showing that heterogeneity in analyst questions, while potentially lowering acquisition costs by broadening public signals, can simultaneously elevate integration costs and thereby increase investor information asymmetry. In this way, we respond to the call by Blankespoor and Marinovic (2020) for more comprehensive evidence on how different dimensions of information processing costs affect capital market outcomes.

The remainder of the paper is organised as follows. In Section 2, we discuss the related literature and develop our hypotheses. Section 3 details our empirical design. Section 4 presents and discusses the main results, additional analyses, and robustness tests. Finally, in Section 5, we conclude by summarising the key findings.

2. Hypotheses development

ECCs are high-profile public events that play a critical role in the disseminating firm-specific information. Accordingly, prior research has consistently highlighted their informational value. For instance, S. Brown et al. (2004) and Kimbrough (2005) find that ECCs reduce information asymmetry among investors and attenuate post-earnings announcement drift (PEAD), respectively. Building on these findings, subsequent studies have explored how variation in the content of ECCs further influences their effectiveness. Hollander et al. (2010), J. Lee (2016), and Rennekamp et al. (2022) show that managerial responsiveness to analysts' questions significantly shapes investor reactions. Haag et al. (2023) and Allee et al. (2025) find that when analysts challenge managers by asking questions that deviate linguistically from the managerial presentation during the introduction session of the ECC, investors react more strongly consistent with ECCs being more informative in such cases.

Yet, as Blankespoor and Marinovic (2020) emphasise, the public nature of ECCs and the documented market reactions do not imply that information is immediately, fully, or costlessly incorporated into prices. Investors face non-trivial information processing costs, which can impede the assimilation of public information into prices, particularly when the cost of using it exceeds its perceived benefit (Bloomfield, 2002; Grossman & Stiglitz, 1980). As outlined by Blankespoor and Marinovic (2020), these frictions occur at three key stages: awareness (becoming aware that information exists), acquisition (accessing the relevant information), and integration (incorporating it into investment decisions).

Awareness and acquisition costs have been a particular focus of Securities and Exchange Commission regulation, as empirical research consistently shows that these frictions remain significant². However, while awareness and acquisition costs clearly limit investors' ability to process information, they do not fully explain market outcomes. Blankespoor et al. (2019) find that even when these costs are minimal, individuals often ignore earnings information, suggesting the presence of another important friction: integration costs. These refer to the cognitive effort required to interpret, evaluate, and incorporate accounting data into valuation models and trading decisions (Hodge et al., 2004). Ample research highlights the significance of integration costs. You and Zhang (2009) find that investor underreaction is more severe for firms with more complex 10-K filings. Similarly, Tetlock (2011) finds that investors are more responsive to repeated news items, consistent with the idea that novel information is harder to process. C. M. Lee and Zhong (2022) demonstrate that even when given the chance to question management directly, investors often focus on clarifying existing, but complex, public information. Broader evidence from studies on accounting anomalies, such as accrual mispricing and PEAD (Collins et al., 2003; Price et al., 2012; Sloan, 1996), further supports the notion that limits in processing capacity hinder the full and/or immediate integration of available data into prices.

Financial analysts, as key information intermediaries, help mitigate these frictions. Analysts reduce investors' processing costs by uncovering private information and offering expert interpretations of public disclosures. Prior research shows that analysts help lower awareness and acquisition costs by synthesising dispersed information and generating firm-specific insights (Barth, Cram, et al., 2001; X. Chen et al., 2010). They also reduce integration costs by framing complex information and issuing informed recommendations, particularly when firms' disclosures are opaque or ambiguous (Huang et al., 2018). Supporting this view, Barth, Cram,

²For instance, Hirshleifer and Teoh (2003) find that market reactions to earnings announcements are muted when many firms report on the same day. Frederickson and Zolotoy (2016) show that retail investors are more likely to focus on highly visible firms under such conditions. More recently, Israeli et al. (2021) demonstrates that retail investor attention and trading responses are weakened on days with competing news. Collectively, these studies suggest that investors, particularly retail investors, struggle to process information from multiple sources simultaneously due to resource constraints.

et al. (2001) find that analysts are more likely to follow firms with hard-to-value intangible assets, and Huang et al. (2018) show that analyst reports generate investor reactions not only due to new information, but also through their interpretations of existing disclosures.

An especially relevant setting for observing analyst-facilitated information acquisition is the Q&A session of ECCs where analysts publicly pose questions to management in real time³. Investors appear to respond more strongly to this session relative to the scripted presentation, suggesting that analysts help surface valuable new information during these interactions (J. V. Chen et al., 2018). Unlike formal analyst reports, the Q&A interactions are less structured and more spontaneous, allowing researchers to observe analysts' immediate reactions and information-seeking behaviour. Prior work notes that analysts face incentives to conform due to reputational concerns, often leading to herding in forecasts (Clement & Tse, 2005; Jegadeesh & Kim, 2010; Trueman, 1994; Welch, 2000). In contrast, the questions analysts pose during Q&A sessions are more likely to reflect individual characteristics, including beliefs and private information sets. Although managers often attempt to control the flow of the conversation by selecting which analysts can speak (Cohen et al., 2020; Mayew, 2008), heterogeneity in analyst questioning remains evident. For instance, Call et al. (2021) find that, compared to sell-side analysts, buy-side analysts ask different types of questions that are shorter and convey more negativity and uncertainty. Comprix et al. (2022) find that gender also affects the negativity and aggressiveness of analyst questions, with male analysts asking more aggressive questions. Haag et al. (2023) find results consistent with analysts questions reflecting their efforts to balance gathering new information from managers and maintaining a comparative advantage among their peers. Similar to Mayew et al. (2020), they find that analysts with information disadvantages and less access to managers are more likely to ask questions that challenge the managers and elicit high informational value responses. Lastly, Allee et al. (2025) find that analysts with less experience, lower workload, and better private information sets ask more unique questions and elicit more information from managers.

Collectively this literature is based on the premise that more information is generally beneficial for price discovery and that analyst questions reveal, at least partially, their private information set and data-gathering focus. That renders ECCs a unique opportunity for investors to receive multiple signals from analysts they might not have had access to otherwise. However, an implicit assumption in many of these studies is that investors are homogeneously equipped to process such information and that more signals are uniformly beneficial to investors. This assumption is challenged by research on information processing costs, which shows that the incorporation of public information into prices may still be hindered by some investors' high integration costs (Blankespoor & Marinovic, 2020; Gomez, 2024; Hirshleifer & Teoh, 2003). As heterogeneity in questions increases, the number of signals to be processed and the need to classify them based on analyst ability, resources, and incentives should also increase. This might also explain why Allee et al. (2025) find that Q&A segments are more informative when analysts overall challenge managers but less so when analysts' questions differ from each other. In this light, we argue that while analyst question heterogeneity may increase the volume and diversity of value-relevant signals, it may also increase the cognitive and interpretive burden required to extract and integrate these signals into valuation, with integration costs varying across investors. Specifically, we propose the following hypothesis:

H1: Heterogeneity in analyst questions is associated with higher investor information asymmetry around ECCs.

³Following Regulation Fair Disclosure (Reg FD), enacted in 2000, firms are prohibited from sharing material non-public information with select analysts, which has made the public Q&A session a crucial venue for real-time information extraction.

We expect this association to vary across contexts depending on investors' information processing costs. One factor affecting investors integration costs is the magnitude of earnings surprises. Large surprises, by definition, deviate from investor expectations and require significant belief updating. Bamber (1987) finds that such surprises result in more dispersed beliefs and increased trading activity. Similarly, Holthausen and Verrecchia (1990) and Kim and Verrecchia (1997) argue that large, information-rich announcements heighten integration demands, leading to increased investor information asymmetry. However, the direction of the surprise also matters. S. Brown and Hillegeist (2007) and Peng et al. (2020) find that positive earnings surprises tend to reduce investors' information integration costs and facilitate consensus, whereas negative surprises increase these costs. This is consistent with the idea that bad news forces a revision of optimistic priors, increasing information-processing burdens, while good news confirms expectations and is easier to absorb. We therefore expect analyst question heterogeneity to have a weaker effect on investor information asymmetry when firms report positive performance:

H2a: The association between heterogeneity in analyst questions and investor information asymmetry is less positive for high-performing firms.

Another moderating factor we examine is the composition of a firm's investor base. Institutional investors are widely viewed as more sophisticated than retail investors with better access to information and analytical resources. As institutional investors face lower marginal costs in acquiring and interpreting information, they become less dependent on ECCs as a source of insight. Bartov et al. (2000) and Collins et al. (2003) show that institutional investors improve pricing efficiency and reduce market anomalies, while Jiambalvo et al. (2002) finds that institutional ownership facilitates the incorporation of forward-looking information into stock prices. In our setting, we expect the presence of institutional investors to attenuate the effect of analyst question heterogeneity, both because institutional investors are less reliant on ECCs and because their presence may reduce the efforts of retail investors to further acquire and process public signals, as the price is already highly informative about value.

H2b: The association between heterogeneity in analyst questions and investor information asymmetry is less positive for firms with high institutional ownership.

3. Empirical design

We test how heterogeneity in analysts' questions during ECCs is associated with investor information asymmetry (H1) by estimating the following ordinary least squares regression model:

$$InformationAsymmetry_{i,q} = \hat{\alpha}_i + \hat{\beta}_i \cdot AnalystHeterogeneity_{i,q} + \sum_{j=1}^J \hat{\delta}_j \cdot Controls_{j,i,q}, \quad (1)$$

where $InformationAsymmetry_{i,q}$ is measured based on the unexplained trading volume (see Section 3.2) for firm i in quarter q , $AnalystHeterogeneity_{i,q}$ is one of our proxies for heterogeneity in analysts' questions (see Section 3.1), $Controls_{j,i,q}$ represent a set of control variables, and $\hat{\alpha}_i$, $\hat{\beta}_i$, and $\sum_{j=1}^J \hat{\delta}_j$ are the estimated coefficients. We use industry and quarter-year-fixed effects to hold constant any industry- or time-specific characteristics of a call. Further, we estimate Equation (1) with robust standard errors clustered at the firm level. All variables are defined in Table IA.1 of the Internet Appendix.

Table 1. Sample Construction.

ECC quarter-year observations	
Initial sample of transcripts	144,273
Less observations not listed in Compustat	13,077
Less observations not listed in IBES	20,985
Less observations not listed in Capital IQ	5767
Less observations with missing values in Compustat	22,840
Less observations with missing previous quarter-year observation in Compustat for calculating Delta ROA	11,382
Less observations with missing values in CRSP	125
Less observations with missing values in IBES	5610
Less observations with missing values for calculating ECC control variables	234
Sample for main regressions	64,253
Number of firms in sample for main regressions	3176

Note: This table presents the sample selection procedure. The base-line sample in our main analysis comprises 64,253 conference calls. All variables are as defined in Table IA.1 of the Internet Appendix.

To capture the moderating effects of high-performing firms (Hypothesis H2a) and high institutional ownership (H2b), we estimate the following model:

$$\begin{aligned}
 \text{InformationAsymmetry}_{i,q} = & \hat{\alpha}_i + \hat{\beta}_i^1 \cdot \text{AnalystHeterogeneity}_{i,q} + \hat{\beta}_i^2 \cdot \text{Factor}_{i,q} \\
 & + \hat{\beta}_i^3 \cdot \text{AnalystHeterogeneity}_{i,q} \cdot \text{Factor}_{i,q} \\
 & + \sum_{j=1}^J \hat{\delta}_j \cdot \text{Controls}_{j,i,q},
 \end{aligned} \tag{2}$$

where $\text{Factor}_{i,q}$ is an indicator variable that measures high positive surprise or high institutional ownership. As in Equation (1), we use industry and quarter-year-fixed effects and cluster standard errors at the firm level.

Our initial sample consists of all quarterly ECC transcripts of U.S.-listed firms over the period 2007–2020 available from the data provider Finnhub Stock API.⁴ The quarterly observations are supplemented with firm fundamentals and stock market data from the Center for Research in Security Prices (CRSP) and Compustat, data on analysts covering the firms from the Institutional Brokers' Estimate System (IBES), as well as the dates and times of the ECCs and the percentage of shares held by institutional owners from S&P Capital IQ.⁵ After dropping all observations for which we cannot estimate the required variables, we end up with 64,253 ECCs corresponding to 3,176 unique firms. Table 1 details our sample construction.

3.1. Measuring heterogeneity in analyst questions

For each quarterly ECC transcript in our data, we segment and preprocess it as described in Internet Appendix IA.1 and derive five measures from the questions in the Q&A session that

⁴<https://finnhub.io/>

⁵The data from CRSP, Compustat, and IBES are derived from the WRDS platform.

serve as proxies for the heterogeneity of information demanded by analysts. First, we measure the *number of questions* asked during the ECC. Assuming that the questions are not entirely repetitive, a higher number indicates a broader range of interests.

Second, we analyse the *variation in the tone of analysts* by calculating the standard deviation of tone negativity among all questions in an ECC, measured using the word lists compiled by Loughran and McDonald (2016). Significant variation in negativity suggests analysts' differing scepticism about the firm's future.

Third, we measure the *divergence of thematic interests* among analysts to capture the heterogeneity in the content of their questions. We measure this by first identifying topics per industry at the four-digit level of the Global Industry Classification Standard, thereby accounting for industry-specific differences, following prior accounting literature (N. C. Brown *et al.*, 2020; Dyer *et al.*, 2017; Huang *et al.*, 2018). The topics are identified using MALLET's Latent Dirichlet Allocation (LDA) algorithm, an advanced unsupervised Bayesian machine learning technique that models human text-generation processes (Blei *et al.*, 2003; Chang *et al.*, 2009; McCallum, 2002). After identifying the topics for each industry, we generate a topic vector for every analyst question in each of the ECCs. The size of each vector corresponds to the number of topics identified for the industry to which the firm belongs, with each value ranging from 0 to 1 and representing the proportion of the question's content associated with each topic. Next, we calculate the standard deviation of the topic proportions, separately for each topic, across all analyst questions within each ECC. Finally, we compute topic divergence at the ECC level by averaging the standard deviations across all topics. Additional details on topic modelling and variable construction are provided in Internet Appendix IA.2.

Fourth, we calculate *uniqueness* as a proxy for analyst heterogeneity, capturing the extent to which each analyst's question differs from those previously asked within the same ECC. Following Allee *et al.* (2025), for each analyst question in the call, we first compute the cosine similarity between the vector of words in this question and the vector of words of a reference text containing all prior analyst questions in the call. We then define the uniqueness of each question as one minus the cosine similarity, ensuring that higher values indicate greater distinctiveness in phrasing and wording. For the empirical tests, we aggregate this measure at the ECC level by computing the mean uniqueness score across all analyst questions within the ECC. This approach captures differences in how analysts structure their inquiries, distinguishing variations in linguistic formulation, but does not necessarily capture thematic divergence.

Finally, we assess the influx of new perspectives by identifying the *number of analysts* who are relatively new ECC participants, specifically those attending a firm's ECC for the first or second time.

3.2. Measuring investor information asymmetry

We measure investor information asymmetry using unexplained trading volume, following Garfinkel (2009), who argues that this proxy outperforms alternatives such as bid-ask spreads, return volatility, and analyst forecast dispersion. We interpret higher unexplained volume as indicative of opinion divergence arising from information asymmetry, where differences in investors' ability to process information lead to varying valuations, consistent with Blankespoor and Marinovic (2020).

Following Garfinkel (2009), we calculate the unexplained trading volume for each of our quarterly ECC observations as the change in the market-adjusted percentage of outstanding shares

traded ($\Delta TO_{i,t}$) for firm i on the trading day of the ECC t .⁶ First, we calculate the percentage of outstanding shares traded by dividing the total number of shares sold on a day ($Vol_{i,t}$) by the number of shares outstanding ($Shs_{i,t}$) and then multiplying the result by 100. Next, to account for the correlation between firm-specific and market-wide trading, we subtract the market-wide percentage of outstanding shares traded on the same trading day, calculated in the same manner across all NYSE and NASDAQ. This yields the market-adjusted percentage of outstanding shares traded:

$$MATO_{i,t} = 100 \cdot \frac{Vol_{i,t}}{Shs_{i,t}} - 100 \cdot \frac{Vol_t^m}{Shs_t^m}, \quad (3)$$

where Vol_t^m and Shs_t^m are the daily total number of shares sold and the number of shares outstanding at the market level. Finally, we calculate $\Delta TO_{i,t}$ as the difference between $MATO_{i,t}$ on the ECC trading day and the average $MATO_{i,j}$ over the previous 20 trading days:

$$\Delta TO_{i,t} = MATO_{i,t} - \left(\sum_{j=t-20}^{t-1} MATO_{i,j} \right) / 20. \quad (4)$$

3.3. Control variables

Guided by prior literature and identification considerations, we include a broad set of firm- and ECC- level control variables to capture variation in the information environment of firms. All variables are defined in Table IA.1 of the Internet Appendix.

We include the unexplained trading volume on the trading day prior to the ECC to control for prior investor disagreement. Including the lagged dependent variable helps absorb unobserved, persistent firm-level factors that may jointly affect investor disagreement and analysts' questioning behaviour.

We also include speech pattern characteristics from the introductory segment of ECCs. We measure the specificity in the introduction as the ratio of tokens representing time, date, location, numbers, percentages, and currency, provided by Stanford's Named Entity Recognition (NER) label sequences (Manning & Schütze, 1999).⁷ Further, we derive the tone and uncertainty in the introductory sections through sentiment analysis using the Loughran and McDonald (2016) word lists. Specifically, we calculate tone in the introduction as the fraction of positive tokens minus the fraction of negative tokens, categorised using their respective positive and negative word lists. Moreover, we measure uncertainty as the fraction of tokens categorised as uncertain in their uncertainty word lists.

To alleviate concerns that we capture variation in the initial scope of topics introduced by management rather than differences in analysts perspectives, we include topic distribution in the introduction to control for the breadth of information disclosed by management prior to the Q&A session. Specifically, for each ECC, we first apply the LDA algorithm and the industry-specific topics identified, as described in Section 3.1 and Internet Appendix IA.2, to compute a vector of proportions representing the content of management's introduction associated with each topic. We then construct the control variable *Introduction Topic Diversity* as the standard deviation of these proportions, multiplied by -1 , so that higher values indicate a more diverse distribution of topics rather than a concentration on a few dominant themes.

⁶The trading day of the ECC is the date when the ECC was conducted, provided it occurred during the trading hours of the NYSE and NASDAQ. If the ECC took place outside trading hours, the ECC trading day is the first trading day after the ECC.

⁷<https://nlp.stanford.edu/software/CRF-NER.html>

Prior literature has established a link between the firm's information environment and analyst behaviour (Barth, Kasznik, et al., 2001; Lehavy et al., 2011). To address the potential self-selection of more vocal analysts into more complex firms, we control for the fraction of questions in each ECC that come from analysts affiliated with the 10 most vocal brokerage firms. More vocal brokerage firms are identified based on the number of questions raised by analysts from those brokerage houses across all ECCs in our sample of transcripts. Moreover, we control for analysts' prior forecast dispersion, which measures the degree of disagreement among analysts before the ECC. Prior research suggests that high forecast dispersion reflects greater uncertainty and divergent expectations about a firm's future performance, which can exacerbate information asymmetry (Barron et al., 1998; Diether et al., 2002). Additionally, we control for the number of ECCs held by firms in the same industry on the same day since multiple ECCs on the same day may affect analysts and investors' attention.

Lastly, following Hope and Wang (2018), we include several financial and firm-fundamental controls. We control for firm size to capture size-related information asymmetries (Glosten & Harris, 1988; Leuz, 2003), firm leverage to capture the level of monitoring of the firm, and the book-to-market ratio to capture the level of growth opportunities or risk associated with investor disagreement. We include an earnings-surprise variable to control for 'new' information provided to the market by announced earnings (Bushee et al., 2010), analyst coverage to control for variation in the competitiveness of analysts' information environments, and the quarterly change in return on assets (ROA), which is positively associated with firm-investor information asymmetries (S. Brown & Hillegeist, 2007). We also control for loss to address managers' tendency to provide more insights and supplemental disclosures when reporting bad news.

3.4. Descriptive statistics

Table 2 reports the summary statistics. All continuous variables are winsorised at the top and bottom 1%. Panel A provides an overview of variables derived from ECCs and Panel B presents other variables. On average, each firm receives 23.301 questions per call. Additionally, an average of 2.617 analysts participate for the first or second time, indicating some degree of turnover among the analysts asking questions. Across all the proxies for analyst heterogeneity, we observe a significant level of variability, with the ratio of standard deviation to mean being 0.473, 0.516, 0.143, 0.048, and 1.024, respectively, for *Number of Questions*, *Tone Divergence*, *Topic Divergence*, *Uniqueness*, and *New Analysts*. This indicates a notable degree of difference in analyst question heterogeneity across the conference calls. On average, 28.5% of all questions asked during the ECCs come from analysts at the top 10 most active brokerage firms. However, this varies significantly between calls, as the ratio of standard deviation to mean is 0.751. Lastly, the summary statistics for the control variables are largely consistent with those reported in previous studies (e.g. Bochkay et al., 2020).

Table IA.2 of the Internet Appendix presents the Pearson correlations among the variables used in the main analyses. It indicates that multicollinearity is not a concern. This is further confirmed by an untabulated variance inflation factor analysis conducted after each regression.

4. Results

4.1. Main results

Table 3 presents the results of our baseline model, as described in Equation (1), regressing the level of information asymmetry among investors, proxied by the unexplained trading volume, on the heterogeneity in analysts' questions and control variables. For all five of our proxies

Table 2. Descriptive Statistics.

	Obs.	Mean	St.Dev.	Min	P25	P50	P75	Max
Panel A: Conference call variables								
<i>Number of Questions</i>	64,253	23.301	11.017	4.000	15.000	22.000	30.000	58.000
<i>Tone Divergence</i>	64,253	0.213	0.110	0.026	0.138	0.193	0.265	0.654
<i>Topic Divergence</i>	64,253	0.014	0.002	0.008	0.012	0.014	0.015	0.019
<i>Uniqueness</i>	64,253	0.896	0.043	0.657	0.881	0.906	0.924	0.954
<i>New Analysts</i>	64,253	2.617	2.680	0.000	0.000	2.000	4.000	14.000
<i>Introduction Specificity</i>	64,253	0.059	0.015	0.027	0.049	0.059	0.069	0.102
<i>Introduction Uncertainty</i>	64,253	0.063	0.028	0.011	0.043	0.059	0.079	0.156
<i>Introduction Tone</i>	64,253	0.071	0.081	−0.176	0.021	0.075	0.127	0.251
<i>Introduction Topic Diversity</i>	64,253	−0.090	0.021	−0.153	−0.102	−0.088	−0.076	−0.048
<i>Most Active Brokerage Houses</i>	64,253	0.285	0.214	0.000	0.107	0.286	0.436	0.870
Panel B: Other variables								
<i>Unexplained Volume</i>	64,253	1.994	2.943	−0.632	0.350	1.001	2.357	17.621
<i>Unexplained Volume t-1</i>	64,253	0.390	0.819	−1.131	−0.035	0.179	0.548	4.596
<i>Analyst Coverage</i>	64,253	12.294	7.649	1.000	6.000	11.000	16.000	36.000
<i>Size</i>	64,253	7.833	1.749	3.449	6.630	7.817	9.017	11.917
<i>Leverage</i>	64,253	0.459	0.227	0.055	0.300	0.442	0.590	1.239
<i>Book to Market</i>	64,253	0.519	0.607	−0.400	0.196	0.378	0.661	5.678
<i>Surprise</i>	64,253	0.120	1.759	−11.924	−0.048	0.044	0.236	10.699
<i>Delta ROA</i>	64,253	−0.000	0.033	−0.139	−0.007	0.000	0.007	0.139
<i>Loss</i>	64,253	0.196	0.397	0.000	0.000	0.000	0.000	1.000
<i>Prior Forecast Dispersion</i>	64,253	0.288	0.741	0.006	0.034	0.080	0.207	5.679
<i>ECC Industry Clustering</i>	64,253	8.111	7.548	1.000	3.000	6.000	11.000	56.000
<i>Institutional Ownership</i>	64,253	19.114	14.481	0.000	4.765	19.476	29.910	54.802

Note: This table provides summary statistics for the variables used in the empirical analyses. All variables are winsorised at the 1st and 99th percentiles. All variables are as defined in Table IA.1 of the Internet Appendix.

for analyst question heterogeneity, we find a positive coefficient that is statistically significant below the 0.1% level. This indicates that greater heterogeneity in the questions posed by analysts increases the difficulty investors face in integrating the information into their valuations, ultimately resulting in information asymmetry and greater investor disagreement.

The positive coefficient for Number of Questions (Column 1; 0.014; p -value < 0.001) suggests that a one-standard-deviation increase in the number of questions is associated with a 0.15% increase in daily outstanding shares traded, which corresponds to a 7.7% increase from the average of 1.99% (see Table 2). The divergence in the negative tone of analysts' questions, *Tone Divergence*, which is a more direct measure of analyst heterogeneity as it reflects the variation in analysts' sentiments and perspectives, is also associated with a positive and statistically significant coefficient (Column 2; 0.470; p -value < 0.001). Economically, a one-standard-deviation increase in tone divergence leads to a 0.05% increase in daily outstanding shares traded, representing a 2.6% increase from the average of 1.99%. Column 3 of Table 3 shows that topic divergence, *Topic Divergence*, is also positively and significantly related to information asymmetry (49.703; p -value < 0.001). This measure captures the breadth of topics considered important by analysts, highlighting the diversity of focus that can contribute to differences in investor valuation due to variations in information integration costs. Economically, a one-standard-deviation increase in topic divergence is associated with a 0.10% increase in daily outstanding shares traded, representing a 5.0% rise relative to the mean. Further, the distinctiveness of analyst

Table 3. Analyst Heterogeneity and Investor Disagreement.

(Dep Variable: <i>Unexplained Volume</i>)	(1)	(2)	(3)	(4)	(5)
<i>Number of Questions</i>	0.014*** (0.002)				
<i>Tone Divergence</i>		0.470*** (0.098)			
<i>Topic Divergence</i>			49.703*** (7.306)		
<i>Uniqueness</i>				2.595*** (0.369)	
<i>New Analysts</i>					0.042*** (0.004)
<i>Introduction Specificity</i>	-8.261*** (1.412)	-7.146*** (1.415)	-6.783*** (1.412)	-7.847*** (1.409)	-7.259*** (1.409)
<i>Introduction Uncertainty</i>	2.288*** (0.632)	2.369*** (0.635)	2.370*** (0.634)	2.282*** (0.635)	2.367*** (0.632)
<i>Introduction Tone</i>	-0.724*** (0.212)	-0.693*** (0.214)	-0.818*** (0.211)	-0.773*** (0.212)	-0.781*** (0.212)
<i>Introduction Topic Diversity</i>	3.950*** (1.106)	4.194*** (1.104)	3.945*** (1.100)	3.991*** (1.103)	4.157*** (1.100)
<i>Most Active Brokerage Houses</i>	0.225*** (0.084)	0.192** (0.084)	0.160* (0.084)	0.217** (0.084)	0.185** (0.084)
<i>Unexplained Volume t-1</i>	1.809*** (0.038)	1.817*** (0.038)	1.812*** (0.038)	1.814*** (0.038)	1.811*** (0.038)
<i>Analyst Coverage</i>	0.048*** (0.004)	0.052*** (0.004)	0.050*** (0.004)	0.050*** (0.004)	0.048*** (0.004)
<i>Size</i>	-0.288*** (0.017)	-0.281*** (0.017)	-0.295*** (0.017)	-0.288*** (0.017)	-0.277*** (0.017)
<i>Leverage</i>	0.005 (0.104)	0.007 (0.103)	-0.001 (0.103)	0.004 (0.103)	0.013 (0.103)
<i>Book to Market</i>	-0.069** (0.034)	-0.080** (0.034)	-0.080** (0.034)	-0.076** (0.034)	-0.068** (0.034)
<i>Surprise</i>	-0.002 (0.007)	-0.005 (0.007)	-0.006 (0.007)	-0.003 (0.007)	-0.004 (0.007)
<i>Delta ROA</i>	0.801** (0.354)	0.831** (0.355)	0.791** (0.355)	0.792** (0.355)	0.806** (0.354)
<i>Loss</i>	-0.107** (0.053)	-0.109** (0.053)	-0.112** (0.053)	-0.106** (0.053)	-0.118** (0.053)
<i>Prior Forecast Dispersion</i>	0.065*** (0.018)	0.065*** (0.018)	0.063*** (0.018)	0.064*** (0.018)	0.064*** (0.018)
<i>ECC Industry Clustering</i>	-0.011*** (0.002)	-0.011*** (0.002)	-0.011*** (0.002)	-0.011*** (0.002)	-0.012*** (0.002)
<i>Intercept</i>	3.458*** (0.172)	3.531*** (0.172)	3.062*** (0.181)	1.405*** (0.356)	3.549*** (0.171)
Quarter Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
St. Errors clustered at firm level	Yes	Yes	Yes	Yes	Yes
Observations	64,253	64,253	64,253	64,253	64,253
R ²	0.367	0.365	0.366	0.366	0.366

Note: This table reports OLS estimates of investor information asymmetry, proxied by *Unexplained Volume*, on our five analyst question heterogeneity measures. Standard errors are clustered at the firm level and shown in parentheses; ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively. We use industry and quarter-year fixed effects.

questions compared to prior questions in the ECC, *Uniqueness*, is also positively and significantly related to investor information asymmetry (2.595; p -value < 0.001). This measure captures the variation in how analysts formulate their questions within the same call, reflecting differences in wording rather than thematic content. Economically, a one-standard-deviation

increase in uniqueness is associated with a 0.11% increase in daily outstanding shares traded, representing a 5.6% rise relative to the mean. Lastly, *New Analysts*, which reflects the fresh perspectives brought by analysts who have not previously participated, has a positive and significant coefficient (Column 5; 0.042; p -value < 0.001). This suggests that new analysts contribute to investor information integration costs by introducing novel viewpoints, thereby increasing information asymmetry. A one-standard-deviation increase in new analysts is associated with a 0.11% increase in daily outstanding shares traded, representing a 5.6% rise relative to the average.

4.2. Cross-sectional analyses

In this section, we investigate whether the association between heterogeneity in analyst questions and investor disagreement is moderated by firm characteristics. In Panel A of Table 4, we demonstrate how a firm's strong financial performance, indicated by an above-median surprise in quarterly earnings, moderates the association between analyst question heterogeneity and unexplained trading volume. To this end, we introduce an interaction term in the regressions between the proxies for analyst heterogeneity and an indicator variable equal to one if the surprise in a firm's earnings for the quarter exceeds the sample median.

Our findings indicate that for firm-quarters with higher earnings surprises, the association between analyst heterogeneity and investor information asymmetry is less positive than for firm-quarters with lower earnings surprises. Specifically, the interaction effects reveal negative coefficients for all proxies of question heterogeneity, with statistical significance at the 1% level for the number of questions, tone divergence and topic divergence and at the 10% level for uniqueness. These findings confirm H2a and are consistent with firms with higher earnings surprises providing clearer positive signals that reduce processing costs and information asymmetry, thereby reducing investor demand for information intermediaries (L. D. Brown et al., 2009; Peng et al., 2020).

Panel B of Table 4 presents the impact of high levels of institutional ownership on the relationship between analyst question heterogeneity and information asymmetry among investors. To classify firms with a high level of institutional ownership, we use an indicator variable that equals one when institutional holdings exceed 20%. This level of ownership is recognised as sufficiently significant to exert substantial influence over corporate governance and decision-making, consistent with the findings of La Porta et al. (1999). We observe a negative coefficient in the interaction between high institutional ownership and all our proxies for analyst question heterogeneity, with statistical significance below 1% for the number of questions, uniqueness, and new analysts. This suggests that firms with high levels of institutional ownership exhibit a weaker association between analyst question heterogeneity and investor information asymmetry. This is expected as institutional investors face lower information-processing costs, which decreases their reliance on analyst interpretations (Bochkay et al., 2020; Heinrichs et al., 2019). Furthermore, price informativeness can be higher for firms with high institutional ownership, resulting in lower processing costs for retail investors as well (Verrecchia, 1982).

4.3. Analysts' and managers' responsiveness

In this section, we investigate how the association between analyst heterogeneity and investor disagreement is moderated by analyst and management responsiveness. We assess analyst responsiveness in terms of same-day forecast revisions. Additionally, we examine management responsiveness along three distinct dimensions: the breadth with which management engages across topics raised by analysts, the spontaneity of their responses, and the extent to which firms strategically shape the Q&A session by selecting which analysts are invited to participate. These

Table 4. Cross-Sectional Analysis.

Panel A: High Positive Surprise					
(Dep Variable: <i>Unexplained Volume</i>)	Number of Questions (1)	Tone Divergence (2)	Topic Divergence (3)	Uniqueness (4)	New Analysts (5)
<i>Analyst Diversity</i>	0.017*** (0.002)	0.700*** (0.128)	74.424*** (8.910)	2.574*** (0.333)	0.046*** (0.006)
<i>High Positive Surprise</i>	0.096* (0.050)	0.027 (0.045)	0.585*** (0.145)	0.656* (0.379)	− 0.065** (0.030)
<i>Analyst Diversity# High Positive Surprise</i>	− 0.008*** (0.002)	− 0.517*** (0.186)	− 49.041*** (10.617)	− 0.826* (0.422)	− 0.008 (0.008)
<i>Intercept</i>	3.381*** (0.174)	3.494*** (0.173)	2.734*** (0.190)	1.428*** (0.332)	3.553*** (0.171)
Controls	Yes	Yes	Yes	Yes	Yes
Quarter-Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
St. Errors clustered at firm level	Yes	Yes	Yes	Yes	Yes
Observations	64,253	64,253	64,253	64,253	64,253
R^2	0.367	0.366	0.366	0.366	0.366
Panel B: Institutional Ownership					
(Dep Variable: <i>Unexplained Volume</i>)	Number of Questions (1)	Tone Divergence (2)	Topic Divergence (3)	Uniqueness (4)	New Analysts (5)
<i>Analyst Diversity</i>	0.020*** (0.002)	0.648*** (0.149)	63.313*** (10.148)	3.981*** (0.424)	0.057*** (0.006)
<i>High IO</i>	0.185** (0.073)	− 0.056 (0.059)	0.255 (0.196)	2.750*** (0.559)	− 0.029 (0.046)
<i>Analyst Diversity# High IO</i>	− 0.014*** (0.003)	− 0.370* (0.193)	− 28.069* (14.813)	− 3.221*** (0.624)	− 0.037*** (0.009)
<i>Intercept</i>	3.266*** (0.174)	3.454*** (0.174)	2.837*** (0.209)	0.124 (0.404)	3.464*** (0.172)
Controls	Yes	Yes	Yes	Yes	Yes
Quarter-Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
St. Errors clustered at firm level	Yes	Yes	Yes	Yes	Yes
Observations	64,253	64,253	64,253	64,253	64,253
R^2	0.368	0.366	0.366	0.367	0.367

Note: This table reports OLS estimates of how firm characteristics moderate the association between analyst question heterogeneity and investor information asymmetry, where the dependent variable is *Unexplained Volume* and *Analyst Diversity* denotes the heterogeneity proxy named in each column. In Panel A, analyst question heterogeneity is interacted with a dichotomous variable equal to one when the firm's earnings surprise for the quarter exceeds the sample median. In Panel B, analyst question heterogeneity is interacted with a dichotomous variable equal to one when institutional ownership is high, defined as holdings above 20%. Standard errors are clustered at the firm level and shown in parentheses; ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively. We use industry and quarter-year fixed effects. All regressions include a set of controls defined in Table IA.1 of the Internet Appendix: *Introduction Specificity*, *Introduction Uncertainty*, *Introduction Tone*, *Introduction Topic Diversity*, *Most Active Brokerage Houses*, *Unexplained Volume t-1*, *Analyst Coverage*, *Size*, *Leverage*, *Book to Market*, *Surprise*, *Delta ROA*, *Loss*, *Prior Forecast Dispersion*, and *ECC Industry Clustering*.

analyses exploit unique features of ECCs to provide additional evidence on the mechanisms through which analyst heterogeneity affects investor disagreement. Concurrently, examining the

association across multiple, conceptually distinct partitions provides a series of cross-sectional tests that reduce the scope for alternative explanations (Jiang, 2017).

Findings by Amiram et al. (2016) indicate that, unlike management earnings announcements or forecasts, analyst earnings forecasts actually reduce information asymmetry at the time of their release. They show that this effect holds for both good news (upward revisions) and bad news (downward revisions) relative to the prior consensus, suggesting that analyst forecasts help bridge the information gap regardless of the news direction. Given that analyst heterogeneity during ECCs increases information asymmetry, it is important to examine whether the impact of real-time forecast revisions differs from the average effect found in Amiram et al. (2016). To test this, we analyse analyst forecast updates made on the trading day of the ECC, capturing how analysts immediately adjust their expectations in response to the ECC. Specifically, we measure the fractions of analysts issuing upward and downward net income forecast revisions, respectively, relative to all forecasts during the ECC trading day, reflecting the extent to which analysts align with a more optimistic or pessimistic outlook. We then construct two indicator variables: one that equals one if the fraction of positive revisions is above the median, and the other equals one if the fraction of negative revisions is above the median. These are then interacted with the analyst heterogeneity proxies. This approach allows us to examine whether, despite the initial differential focus of analysts during the ECC, forecast revisions within the same trading day reflect a consensus shift in expectations and whether this shift mitigates the information asymmetry introduced by analyst heterogeneity.

In Table 5, Panels A and B present the moderating effects of same-day positive and negative forecast revisions, respectively. Consistent with our previous findings, the coefficients for all proxies of analyst heterogeneity remain positive and significant. Additionally, the results indicate that same-day forecast revisions influence the association between analyst heterogeneity and investor disagreement in an asymmetric manner. Specifically, in Panel A, across all proxies for analyst diversity, we observe a negative coefficient for the interaction term between the proxies and the above-median fraction of positive revisions. For most proxies, this coefficient is significant, including for the number of questions, tone divergence, topic divergence, and new analysts. This suggests that when analysts predominantly revise their forecasts upward during the ECC trading day, it mitigates the information asymmetry introduced by analyst heterogeneity. In contrast, Panel B shows the opposite pattern in the cases of above-median negative revisions. Specifically, across all proxies for analyst diversity, we observe a positive coefficient for the interaction term between the proxies and the above-median fraction of negative revisions, which is significant for tone divergence, topic divergence, and new analysts. This is consistent with analysts' downward revisions amplifying the association between analyst question heterogeneity and information asymmetry.

Prior research shows that management engagement during ECCs influences how investors process information (Rennekamp et al., 2022). We conceptualise management responsiveness during the Q&A as a multifaceted concept that encompasses how managers engage with analyst topics, how spontaneously they respond, and how analyst participation is structured. This subsection presents results indicating that these dimensions of management responsiveness moderate the association between analyst heterogeneity and investor information asymmetry.

We first focus on how management engages with the diverse topics raised by analysts during the Q&A session. Managers may choose to address a broad set of analyst concerns or selectively concentrate on a narrower subset, which can influence how investors process heterogeneous information. To examine this channel, we test whether the extent to which management addresses diverse analyst topics moderates the association between analyst heterogeneity and investor information asymmetry. We measure this engagement by the breadth of topics covered in management's answers to analysts' questions. Specifically, we construct a measure similar to

Table 5. Analyst Responsiveness and Investor Disagreement.

Panel A: Analyst Positive Response					
(Dep Variable: <i>Unexplained Volume</i>)	Number of Questions (1)	Tone Divergence (2)	Topic Divergence (3)	Uniqueness (4)	New Analysts (5)
<i>Analyst Diversity</i>	0.015*** (0.002)	0.643*** (0.125)	57.356*** (8.471)	2.690*** (0.414)	0.051*** (0.006)
<i>Same day positive revision</i>	− 0.040 (0.045)	− 0.016 (0.043)	0.142 (0.131)	0.086 (0.407)	− 0.066** (0.027)
<i>Analyst Diveristy# Same day positive revision</i>	− 0.003* (0.002)	− 0.470*** (0.178)	− 18.905** (9.554)	− 0.229 (0.452)	− 0.021*** (0.008)
<i>Intercept</i>	3.452*** (0.174)	3.520*** (0.173)	2.980*** (0.189)	1.345*** (0.395)	3.552*** (0.171)
Controls	Yes	Yes	Yes	Yes	Yes
Quarter Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
St. Errors clustered at firm level	Yes	Yes	Yes	Yes	Yes
Observations	64,253	64,253	64,253	64,253	64,253
R^2	0.367	0.366	0.366	0.367	0.367
Panel B: Analyst Negative Response					
(Dep Variable: <i>Unexplained Volume</i>)	Number of Questions (1)	Tone Divergence (2)	Topic Divergence (3)	Uniqueness (4)	New Analysts (5)
<i>Analyst Diversity</i>	0.012*** (0.002)	0.228* (0.135)	37.418*** (8.820)	2.571*** (0.447)	0.032*** (0.006)
<i>Same day negative revision</i>	0.061 (0.045)	0.023 (0.042)	− 0.188 (0.129)	0.058 (0.413)	0.065** (0.027)
<i>Analyst Diveristy# Same day negative revision</i>	0.002 (0.002)	0.394** (0.176)	21.610** (9.410)	0.059 (0.459)	0.018** (0.008)
<i>Intercept</i>	3.406*** (0.173)	3.506*** (0.173)	3.150*** (0.195)	1.347*** (0.421)	3.495*** (0.171)
Controls	Yes	Yes	Yes	Yes	Yes
Quarter Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
St. Errors clustered at firm level	Yes	Yes	Yes	Yes	Yes
Observations	64,253	64,253	64,253	64,253	64,253
R^2	0.367	0.366	0.366	0.366	0.367

Note: This table reports OLS estimates of how analysts' same day forecast revisions moderate the association between analyst question heterogeneity and investor information asymmetry, where the dependent variable is *Unexplained Volume* and *Analyst Diversity* denotes the heterogeneity proxy named in each column. In Panel A, analyst question heterogeneity is interacted with a dichotomous variable equal to one when the fraction of upward net income forecast revisions issued on the ECC trading day exceeds the sample median. In Panel B, analyst question heterogeneity is interacted with a dichotomous variable equal to one when the fraction of downward net income forecast revisions issued on the ECC trading day exceeds the sample median. Standard errors are clustered at the firm level and shown in parentheses; ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively. We use industry and quarter-year fixed effects. All regressions include a set of controls defined in Table IA.1 of the Internet Appendix: *Introduction Specificity, Introduction Uncertainty, Introduction Tone, Introduction Topic Diversity, Most Active Brokerage Houses, Unexplained Volume t-1, Analyst Coverage, Size, Leverage, Book to Market, Surprise, Delta ROA, Loss, Prior Forecast Dispersion, and ECC Industry Clustering*.

the analyst heterogeneity proxy *Topic Divergence* (see Section 3.1), but use the topic vector for each management answer in the ECCs instead of that for each analyst question. A high measure value suggests a broad, wide-ranging engagement strategy, in which management actively incorporates multiple themes into their answers. This may help reduce the effects of analyst heterogeneity on investor information integration costs by reconciling divergent analyst viewpoints and clarifying the importance and relevance of the issues raised. Conversely, a low value indicates a more selective, constrained engagement, potentially leaving some analyst concerns unaddressed and allowing multiple conflicting interpretations to persist, which may reinforce the effects of analyst heterogeneity on investor information integration costs. To test this, we create an indicator variable called *Mng Topic Divergence*, which equals one if the measure value is above the sample median, indicating high-breadth engagement.

In Panel A of Table 6, we present the regression results that include *Mng Topic Divergence*, both individually and in interaction with the analyst heterogeneity proxies, while keeping all other variables and model specifications unchanged. Consistent with our previous findings, the coefficients for all proxies of analyst heterogeneity remain positive and significant. Further, across all cases, we observe a negative coefficient for the interaction terms, which is significant in most instances, including the number of questions, topic divergence, uniqueness, and new analysts. This indicates that high divergence in the topics covered in management's answers to analysts' questions attenuates the positive association between analyst question heterogeneity and investor information asymmetry.

Beyond the breadth of topics addressed in management's responses, engagement during the Q&A segment also varies in the extent to which managers rely on prepared remarks. Prior research shows that investors can detect scripted managerial responses during ECCs and respond by pricing in higher information asymmetry, consistent with managers providing less incremental information when adhering closely to prepared scripts (J. Lee, 2016). On the one hand, departing from prepared remarks may reduce strategic message control and limit managers' ability to selectively withhold information. On the other hand, reliance on prepared language may help ensure completeness, precision, and internal consistency in responses, particularly when conveying complex information. We therefore examine whether managerial spontaneity, as a characteristic of speech rather than topical engagement, moderates the effect of analyst heterogeneity on investor information asymmetry. To capture this aspect of management engagement, we follow J. Lee (2016) and construct a measure of management spontaneity based on the extent to which management's use of function words in their prepared introductions deviates from their use of function words in their answers during the Q&A segment of the same ECC. Specifically, we use LIWC⁸ to compute the distribution of function words separately for the introduction and for the answers during the Q&A segments of each call, and we measure spontaneity at the call level as the inverse similarity in function-word usage across these two segments. Differences in usage between these portions of the call reflect changes in speaking style rather than differences in subject matter, with larger deviations indicating greater spontaneity in management responses. Further, we construct an indicator variable, *High Spontaneity*, which equals one when the measure is above the sample median.

Panel B of Table 6 presents the regression results using our measure of management spontaneity, both individually and interacted with the analyst heterogeneity proxies, while keeping all other variables and model specifications unchanged. The coefficients for the analyst heterogeneity proxies remain positive and significant across specifications. Moreover, the interaction terms

⁸LIWC (Linguistic Inquiry and Word Count) is a dictionary-based text analysis tool that classifies words into predefined linguistic categories and reports the proportion of words in each category for a given text. We use the LIWC 2022 dictionary and the official LIWC software, available at www.liwc.app.

are negative in all cases and significant for topic divergence and the presence of new analysts. Taken together, these results indicate that less scripted communication weakens the association between analyst question heterogeneity and investor information asymmetry, although the significance of this effect is not consistent across all proxies. This pattern is consistent with managerial spontaneity exerting effects that can work in different directions across dimensions of analyst heterogeneity.

Another channel through which management may influence investor perceptions during ECCs is the composition and ordering of analyst participation in the Q&A session. Prior research shows that, despite variation in analyst characteristics and questions, analyst access during ECCs is not entirely random (Haag *et al.*, 2022; Mayew, 2008). We capture managers' 'casting' efforts by

Table 6. Management Responsiveness and Investor Disagreement.

Panel A: Management Topic Divergence					
(Dep Variable: <i>Unexplained Volume</i>)	Number of Questions (1)	Tone Divergence (2)	Topic Divergence (3)	Uniqueness (4)	New Analysts (5)
<i>Analyst Diversity</i>	0.018*** (0.002)	0.538*** (0.124)	66.719*** (9.483)	3.623*** (0.367)	0.050*** (0.006)
<i>Mng Topic Divergence</i>	0.274*** (0.062)	0.039 (0.049)	0.305* (0.182)	2.121*** (0.519)	0.048 (0.034)
<i>Analyst Diversity#Mng Topic Divergence</i>	−0.010*** (0.002)	−0.154 (0.186)	−25.978* (13.375)	−2.342*** (0.578)	−0.018** (0.008)
<i>Intercept</i>	3.344*** (0.172)	3.515*** (0.172)	2.866*** (0.201)	0.475 (0.355)	3.528*** (0.171)
Controls	Yes	Yes	Yes	Yes	Yes
Quarter Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
St. Errors clustered at firm level	Yes	Yes	Yes	Yes	Yes
Observations	64,253	64,253	64,253	64,253	64,253
R^2	0.367	0.365	0.366	0.366	0.366
Panel B: Management Spontaneity					
(Dep Variable: <i>Unexplained Volume</i>)	Number of Questions (1)	Tone Divergence (2)	Topic Divergence (3)	Uniqueness (4)	New Analysts (5)
<i>Analyst Diversity</i>	0.015*** (0.002)	0.573*** (0.131)	71.484*** (9.187)	2.916*** (0.442)	0.050*** (0.006)
<i>High Spontaneity</i>	−0.060 (0.055)	−0.046 (0.047)	0.643*** (0.155)	0.410 (0.467)	−0.048 (0.033)
<i>Analyst Diversity#High Spontaneity</i>	−0.002 (0.002)	−0.214 (0.181)	−53.304*** (11.331)	−0.577 (0.524)	−0.018** (0.008)
<i>Intercept</i>	3.349*** (0.176)	3.450*** (0.173)	2.716*** (0.194)	1.051** (0.420)	3.466*** (0.172)
Controls	Yes	Yes	Yes	Yes	Yes
Quarter Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
St. Errors clustered at firm level	Yes	Yes	Yes	Yes	Yes
Observations	64,253	64,253	64,253	64,253	64,253
R^2	0.367	0.365	0.366	0.366	0.366

(Continued).

Table 6. Continued.

Panel C: Appraisal					
(Dep Variable: <i>Unexplained Volume</i>)	Number of Questions (1)	Tone Divergence (2)	Topic Divergence (3)	Uniqueness (4)	New Analysts (5)
<i>Analyst Diversity</i>	0.015*** (0.002)	0.686*** (0.114)	50.673*** (8.026)	3.140*** (0.376)	0.046*** (0.005)
<i>High Appraisal</i>	0.103* (0.056)	0.145*** (0.049)	− 0.021 (0.150)	1.826*** (0.490)	0.006 (0.032)
<i>Analyst Diversity#High Appraisal</i>	− 0.007*** (0.002)	− 0.849*** (0.202)	− 1.553 (11.055)	− 2.085*** (0.544)	− 0.017** (0.008)
<i>Intercept</i>	3.431*** (0.172)	3.495*** (0.171)	3.063*** (0.187)	0.931*** (0.357)	3.547*** (0.171)
Controls	Yes	Yes	Yes	Yes	Yes
Quarter Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
St. Errors clustered at firm level	Yes	Yes	Yes	Yes	Yes
Observations	64,253	64,253	64,253	64,253	64,253
R^2	0.367	0.365	0.366	0.366	0.366
Panel D: Forecast Optimism					
(Dep Variable: <i>Unexplained Volume</i>)	Number of Questions (1)	Tone Divergence (2)	Topic Divergence (3)	Uniqueness (4)	New Analysts (5)
<i>Analyst Diversity</i>	0.016*** (0.002)	0.424*** (0.121)	57.560*** (7.885)	3.159*** (0.364)	0.052*** (0.006)
<i>High Forecast Optimism</i>	0.242*** (0.045)	0.073* (0.041)	0.365*** (0.131)	1.912*** (0.458)	0.145*** (0.027)
<i>Analyst Diversity#High Forecast Optimism</i>	− 0.007*** (0.002)	0.094 (0.173)	− 19.936** (9.474)	− 2.044*** (0.508)	− 0.022*** (0.008)
<i>Intercept</i>	3.380*** (0.172)	3.516*** (0.172)	2.929*** (0.187)	0.887** (0.352)	3.505*** (0.170)
Controls	Yes	Yes	Yes	Yes	Yes
Quarter Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
St. Errors clustered at firm level	Yes	Yes	Yes	Yes	Yes
Observations	64,253	64,253	64,253	64,253	64,253
R^2	0.367	0.366	0.366	0.366	0.367

Note: This table reports OLS estimates of how management responsiveness moderates the association between analyst question heterogeneity and investor information asymmetry, where the dependent variable is *Unexplained Volume* and *Analyst Diversity* denotes the heterogeneity proxy named in each column. In Panel A, analyst question heterogeneity is interacted with a dichotomous variable equal to one when the breadth of topics covered in management's answers to analyst questions exceeds the sample median. In Panel B, analyst question heterogeneity is interacted with a dichotomous variable equal to one when management spontaneity, measured as the inverse similarity in function word usage between the introduction and the Q&A answers, exceeds the sample median. In Panel C, analyst question heterogeneity is interacted with a dichotomous variable equal to one when the appraising language of the first analysts to speak, relative to all analysts in the call, exceeds the sample median. In Panel D, analyst question heterogeneity is interacted with a dichotomous variable equal to one when the forecast optimism of the first analysts to speak, relative to all analysts in the call, exceeds the sample median. Standard errors are clustered at the firm level and shown in parentheses; ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively. We use industry and quarter-year fixed effects. All regressions include a set of controls defined in Table IA.1 of the Internet Appendix: *Introduction Specificity*, *Introduction Uncertainty*, *Introduction Tone*, *Introduction Topic Diversity*, *Most Active Brokerage Houses*, *Unexplained Volume t-1*, *Analyst Coverage*, *Size*, *Leverage*, *Book to Market*, *Surprise*, *Delta ROA*, *Loss*, *Prior Forecast Dispersion*, and *ECC Industry Clustering*.

examining whether analysts who ask the first questions exhibit systematically more favourable characteristics than other participating analysts, in a manner that is likely viewed positively by management. Specifically, we assess whether the association between analyst question heterogeneity and investor information asymmetry varies with (i) the relative degree of appraisal expressed in the questions of the first analysts and (ii) the prevailing forecast optimism of these early participants.

Appraising language in analyst questions reflects a favourable form of engagement that can shape how investors interpret information during ECCs. Prior evidence shows that analysts' appraising language conveys information that investors incorporate when forming beliefs and that elicits market reactions beyond those captured by standard sentiment measures (Milian & Smith, 2017). From management's perspective, prioritising analysts who ask appraising questions can help structure the Q&A in a way that frames investor interpretation without altering the underlying information disclosed. We follow the rule-based textual approach of Milian and Smith (2017), identifying appraisal expressions consisting of evaluative adjectives paired with performance-related nouns (e.g. 'great quarter', 'strong performance'). For each analyst in an ECC, we construct an appraisal score by counting the number of such expressions in the analyst's questions and dividing this count by the total number of words the analyst speaks during the call. We then assess whether the first two analysts who ask questions in the ECC exhibit a higher level of appraising language by computing the relative difference between their mean appraisal score and the mean appraisal score of all analysts who ask questions during the call. Further, we generate an indicator variable, *High Appraisal*, which equals one when this measure exceeds the sample median.

Panel C of Table 6 presents the regression results using our measure of excess appraisal by early analysts as a proxy for the relative favourableness of initial analysts, while keeping all other variables and model specifications unchanged. The coefficients on the analyst heterogeneity proxies remain positive and significant across specifications, whereas the coefficients on the interaction terms are negative in all cases and significant for the number of questions, tone divergence, uniqueness, and the presence of new analysts. This suggests that the positive association between analyst heterogeneity and unexplained trading volume is weaker in calls where early analyst questions are relatively more appraising.

While appraisal captures the content-based favourableness of analyst questions, management may also influence investor perceptions by selectively granting early speaking opportunities to analysts who exhibit greater ex-ante forecast optimism relative to other participating analysts. Prior research shows that managers exercise discretion over analyst access during conference calls, granting greater participation to analysts with more favourable outstanding recommendations and reducing access following downgrades (Mayew, 2008). Accordingly, forecast optimism provides a selection-based proxy for whether early speaking opportunities are disproportionately allocated to analysts with a more optimistic prior assessment of the firm. We measure the excess forecast optimism of the first two analysts asking questions in an ECC as the relative difference between the average of their most recent earnings forecasts and the average of the most recent earnings forecasts of all analysts who ask questions during the call. We then construct an indicator variable, *High Forecast Optimism*, which equals one when this measure exceeds the sample median.

Panel D of Table 6 presents the regression results using analysts' prevailing forecast optimism as a selection-based proxy for whether analysts with a more favourable ex-ante stance are given early speaking opportunities during the Q&A. The variable is included both on its own and interacted with the analyst heterogeneity proxies, while keeping all other variables and model specifications unchanged. The coefficients on the analyst heterogeneity proxies remain positive and significant across specifications. The interaction terms are negative in all cases and

significant for the number of questions, topic divergence, uniqueness, and the presence of new analysts. This indicates that granting early speaking opportunities to analysts with a more optimistic ex-ante assessment of the firm attenuates the positive association between analyst question heterogeneity and investor information asymmetry.

4.4. *Endogeneity and alternative hypotheses*

Our proxies for heterogeneity in analysts' questions are designed to capture differences in analysts' information acquisition approaches, which can stem from differences in skill levels, experience, and individual incentives. However, it is important to acknowledge that these proxies may capture more than the heterogeneity in analysts' approaches. It is still possible that we are, to some extent, reflecting the inherent complexity of the firms being analysed or the market reaction to the earnings announcement itself. This overlap can make it challenging to disentangle whether the observed variations are due to analyst heterogeneity or other factors. Consequently, in our main analysis, we control for a broad set of variables capturing ECC and firm characteristics that may jointly influence analyst question heterogeneity and investor disagreement. These controls include measures of specificity, uncertainty, tone, and topic distribution in the introductory section of the ECCs, as well as analyst engagement levels, forecast dispersion, and the number of concurrent ECCs. In this section, we present additional analyses designed to further assess the robustness of our findings and to mitigate concerns about omitted correlated variables. While these analyses still do not provide definitive causal evidence, they strengthen the interpretation that the documented association reflects more than a spurious correlation.

Table 7 reports the results of each robustness test in a separate column, with each column summarising coefficients from five separate regressions corresponding to the five measures of analyst heterogeneity. More detailed regression output for each robustness test are provided in separate panels in Tables IA.3 and IA.4 of the Internet Appendix.

First, we confirm the robustness of our results by employing firm fixed effects. This approach allows us to control for time-invariant firm complexity, ensuring that any variations in our findings are not attributable to the persistent characteristics of individual firms. Table 7, Column (1) summarises the estimated coefficients. All four measures of question heterogeneity continue to exhibit a significant positive association with investor disagreement, even after controlling for firm-specific factors.

Second, we perform a placebo analysis to assess whether our variables of interest, which capture analyst heterogeneity, are associated with unexplained trading volume five days prior to the ECC. The rationale behind this test is that if our main variables merely capture time-invariant firm characteristics rather than heterogeneity in analyst reactions to the earnings announcement, they should also be associated with unexplained trading volume prior to the ECC. The results of our placebo test, presented in Table 7, Column (2), confirm that our key variables – number of questions, tone divergence, topic divergence, and uniqueness – are non-significant, indicating that these measures are not associated with unexplained trading volume in the period before the ECC. This strengthens our argument that the observed effects in our main analysis are specific to analyst heterogeneity during the ECC, rather than reflecting firm characteristics that persist over time. The coefficient for new analysts is significant in the placebo test but has the opposite sign. Since this variable is inherently linked to the ECC itself, this result is unlikely to indicate a meaningful pre-ECC effect. Overall, the placebo test provides further confidence that our findings are driven by analyst heterogeneity during the ECC rather than by underlying firm characteristics.

Table 7. Robustness Tests.

(Dep Variable: <i>Unexplained Volume</i>)	Firm Fixed Effects (1)	Placebo Test (2)	Alternative Unexplained Trading Volume Measure (3)	ECC Trading Day After Press Release (4)	Small Size Subsample (5)	Small Absolute Sales Change Subsample (6)	Small Market-to-Book Subsample (7)
<i>Number of Questions</i>	0.015*** (0.001)	− 0.000 (0.000)	0.016*** (0.002)	0.028*** (0.006)	0.015*** (0.003)	0.011*** (0.002)	0.015*** (0.002)
<i>Tone Divergence</i>	0.602*** (0.085)	0.002 (0.018)	0.852*** (0.140)	0.823* (0.429)	0.502*** (0.141)	0.806*** (0.133)	0.650*** (0.133)
<i>Topic Divergence</i>	23.572*** (5.901)	0.920 (1.214)	37.620*** (9.317)	41.354* (24.641)	53.052*** (9.844)	37.838*** (9.477)	55.697*** (9.870)
<i>Uniqueness</i>	2.328*** (0.308)	− 0.062 (0.054)	3.019*** (0.445)	4.467*** (1.037)	1.537*** (0.324)	1.772*** (0.370)	2.071*** (0.395)
<i>New Analysts</i>	0.018*** (0.004)	− 0.003*** (0.001)	0.020*** (0.006)	0.051*** (0.016)	0.042*** (0.008)	0.033*** (0.006)	0.045*** (0.007)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	No	No	No	No	No	No
St. Errors clustered at firm level	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	64,095	64,253	64,253	3,906	32,127	28,559	32,126

Note: This table presents additional robustness analyses for our baseline association between analyst question heterogeneity and investor information asymmetry, where the dependent variable is *Unexplained Volume*. Each coefficient comes from a separate regression of one heterogeneity proxy under the specification in the column header: firm fixed effects (Column 1), a placebo test using unexplained trading volume five trading days before the ECC (Column 2), an alternative standardised unexplained trading volume measure (Column 3), ECCs held on a trading day after the earnings press release (Column 4), and subsamples of low complexity firms proxied by small size (Column 5), small absolute sales change (Column 6), and small market to book (Column 7). Standard errors are clustered at the firm level and shown in parentheses; ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively. All regressions include a set of controls defined in Table IA.1 of the Internet Appendix: *Introduction Specificity*, *Introduction Uncertainty*, *Introduction Tone*, *Introduction Topic Diversity*, *Most Active Brokerage Houses*, *Unexplained Volume t-1*, *Analyst Coverage*, *Size*, *Leverage*, *Book to Market*, *Surprise*, *Delta ROA*, *Loss*, *Prior Forecast Dispersion*, and *ECC Industry Clustering*. More detailed regression output is provided in Tables IA.3 and IA.4 of the Internet Appendix.

Third, we validate our findings using an alternative measure of unexplained trading volume as the dependent variable. Specifically, we employ the standardised unexplained trading volume, which Garfinkel (2009) identify as the second best proxy for capturing investor opinion divergence, surpassed only by the measure used in our main analysis (see Section 3.2). This measure accounts for the informedness effect, whereby trading volume increases in response to new information reflected in price movements. It is constructed as the standardised prediction error of trading volume on the ECC day, based on a regression of volume on the absolute values of positive and negative returns over the 60 trading days preceding the ECC, scaled by the standard deviation of the regression residuals. The results of this robustness test are presented in Table 7, Column (3). We observe that all proxies for analyst heterogeneity consistently exhibit a positive and significant association with this alternative measure of information asymmetry, thereby reinforcing our confidence in the findings.

Fourth, we restrict our analysis to ECCs that occur on a different trading day than the firm's earnings press release. This allows us to isolate the impact of the qualitative information exchanged during the call from the broader market reaction to the earnings announcement itself. Since earnings press releases typically precede ECCs, they provide investors with key financial figures—such as revenue, earnings per share, and guidance—that drive initial market responses. The subsequent ECCs serve as a platform for management to contextualise these results, clarify uncertainties, and engage with analysts' questions, potentially influencing how investors interpret the earnings news. By focussing only on ECCs that take place on a separate trading day from the earnings announcement, we exclude any effects on investor disagreement stemming from the immediate response to the earnings figures. The results of this robustness test are presented in Table 7, Column (4). They confirm that our findings remain consistent when restricting the sample to ECCs that occur on a trading day following the earnings press release. Specifically, all analyst heterogeneity proxies continue to exhibit a positive and significant association with unexplained trading volume. While some proxies exhibit reduced statistical significance, this is likely due to the substantial decrease in sample size. Despite this limitation, the core patterns observed in our full sample persist, providing further confidence that the effects documented in our study are not driven by the overall information environment surrounding the earnings announcement but rather by the distinct role of analyst heterogeneity during the ECCs.

Fifth, because firms with greater business complexity may exhibit both higher analyst question heterogeneity and greater information asymmetry, we test the robustness of our findings by rerunning our main analyses on the subsample of firms with below-median business complexity. If business complexity is the underlying driver of our main results, the association between analyst heterogeneity and investor information asymmetry should attenuate in these low firm complexity settings. We proxy business complexity using firm size captured by market capitalisation, sales growth rate, and the market-to-book ratio. Prior studies employ these measures when examining firm complexity and information environments (e.g. Barth, Kasznik, et al., 2001; Bushee et al., 2018; X. Chen et al., 2010). Results based on each proxy are presented in Table 7, Columns (5–7). The results are consistent with our main findings: coefficients on analyst heterogeneity remain positive and significant, and in four of five cases, they are larger in magnitude than in the baseline results. This cross-sectional analysis reduces the likelihood that the documented association is driven by complexity-related omitted factors (Jiang, 2017).

Sixth, we implement a matching procedure using inverse probability weighted regression adjustment (IPWRA) to further ensure that the association between analyst heterogeneity and investor information asymmetry is not driven by inherent firm characteristics. While our previous tests, including firm fixed effects and the placebo test, rule out time-invariant firm traits and pre-existing market conditions as confounding factors, this test specifically addresses the

possibility that firms with more complex fundamentals or distinct disclosure environments naturally exhibit higher analyst question heterogeneity and greater investor disagreement. To account for this, we transform our continuous variables that proxy for analyst heterogeneity into ordinal ones, and we match firms based on key characteristics of their information environment during the ECC introduction, including tone, uncertainty, specificity, and the range of topics covered. These features capture the firm's communication style and the level of its disclosures, ensuring that the matched firms are comparable in terms of how management presents information. Additionally, we match for financial complexity, as firms with more intricate financial structures may naturally experience greater disagreement among analysts and investors. We measure financial complexity following Li (2008), which suggests that firms with more complex financial situations tend to have longer and more detailed financial reports. Specifically, we use the logarithm of the number of non-missing financial statement items in Compustat as a proxy for financial complexity, based on the assumption that firms reporting more items have more complex financial structures. IPWRA allows us to account for both selection bias in firm characteristics and residual imbalances, ensuring that any observed differences in investor disagreement are attributed to analyst question heterogeneity rather than firm-specific factors. By comparing firms across different levels of analyst question heterogeneity – specifically, those in the highest and lowest heterogeneity quintiles – we assess whether investor disagreement intensifies as analyst views become more dispersed, independent of underlying firm complexity or disclosure practices.

Table IA.5 of the Internet Appendix presents the results of our IPWRA analysis. The dependent variable in all specifications remains the same as before, that is, *Unexplained Volume*, which serves as a proxy for investor information asymmetry; moreover, we continue to use the same five proxies for analyst heterogeneity. The table presents two comparisons: R2vs1 compares firms in the second quintile of analyst heterogeneity to those in the lowest quintile, while R5vs1 compares firms in the highest quintile to those in the lowest quintile. The findings show that as analyst heterogeneity increases, investor information asymmetry also increases, with the effect being more pronounced at higher levels of heterogeneity. This is evident from the larger coefficients in R5vs1 compared to R2vs1 across all proxies of investor disagreement. In particular, the coefficients for *Number of Questions* (0.423***), *Tone Divergence* (0.162***), and *Topic Divergence* (0.231***) in R5vs1 are substantially larger than those in R2vs1, highlighting that the impact of analyst heterogeneity intensifies as dispersion in analyst interpretations increases. Similarly, the significant coefficients for Uniqueness and New Analysts suggest that a greater variety of viewpoints expressed during the ECC, as well as the presence of new analysts, contribute to heightened information asymmetry. The fact that these associations persist, even after conditioning on firm disclosure complexity and financial characteristics strengthens our conclusion that the observed variation in investor disagreement is driven by analyst heterogeneity during the Q&A, rather than by inherent firm traits or pre-existing disclosure tendencies.

5. Conclusions

Using a dataset of U.S. listed firms' ECCs for the period 2007 to 2020, our analysis demonstrates that greater analyst question heterogeneity – captured by the volume of questions, tone divergence, linguistic (dis)similarity, differential thematic focus of analysts' questions, and the influx of new analysts' perspectives – is associated with increased information asymmetry among investors.

We interpret this finding within the framework proposed by Blankespoor and Marinovic (2020), which emphasises that public information can yield private advantages when processing costs – particularly integration costs – are unevenly distributed across market participants. Consistent with this view, we find that the effect of analyst question heterogeneity

on investor information asymmetry is most pronounced when information processing costs are likely to be higher, such as during negative earnings surprises or in firms with low institutional ownership. Conversely, the effect is mitigated when analysts issue same-day upward forecast revisions and when managers expand the scope of topics addressed in their responses or engage in casting analyst participation. The consistency of our findings across multiple measures, samples, and settings increases confidence that analyst question heterogeneity captures meaningful variation in how information from ECCs is processed by investors. However, as is common in the literature in this area we cannot argue that they constitute indisputable evidence of a causal relation.

By focussing on analysts' heterogeneous behaviour during the Q&A component of ECCs and providing empirical evidence of economically meaningful integration costs for investors, we contribute to the growing literature on the information value of ECCs and the role of analyst–manager interactions (Allee et al., 2025; Cicon, 2017; Davis et al., 2015; Haag et al., 2023; Kimbrough, 2005; Matsumoto et al., 2011). Overall, our findings highlight the dual role of analyst interaction during ECCs: while diverse questioning can enrich the information set, it may also exacerbate information asymmetry among investors. These findings carry important implications for investors, analysts, and managers.

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Data availability statement

The data that support the findings of this study were obtained from S&P Capital IQ under licence.

Disclosure statement

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References

- Allee, K. D., & Deangelis, M. D. (2015). The structure of voluntary disclosure narratives: Evidence from tone dispersion. *Journal of Accounting Research*, 53(2), 241–274.
- Allee, K. D., Do, C., & Do, H. N. (2025). Can analysts elicit useful information by asking unique questions in earnings conference calls? *European Accounting Review*, 34(4), 1689–1715.

- Amiram, D., Owens, E., & Rozenbaum, O. (2016). Do information releases increase or decrease information asymmetry? New evidence from analyst forecast announcements. *Journal of Accounting and Economics*, 62(1), 121–138.
- Bamber, L. S. (1987). Unexpected earnings, firm size, and trading volume around quarterly earnings announcements. *The Accounting Review*, 62(3), 510–532.
- Barron, O. E., Kim, O., Lim, S. C., & Stevens, D. E. (1998). Using analysts' forecasts to measure properties of analysts' information environment. *The Accounting Review*, 73(4), 421–433.
- Barth, A., Mansouri, S., & Wöbbeking, F. (2023). "Let me get back to you" —A machine learning approach to measuring nonanswers. *Management Science*, 69(10), 6333–6348.
- Barth, M. E., Cram, D. P., & Nelson, K. K. (2001). Accruals and the prediction of future cash flows. *The Accounting Review*, 76(1), 27–58.
- Barth, M. E., Kasznik, R., & McNichols, M. F. (2001). Analyst coverage and intangible assets. *Journal of Accounting Research*, 39(1), 1–34.
- Bartov, E., Radhakrishnan, S., & Krinsky, I. (2000). Investor sophistication and patterns in stock returns after earnings announcements. *The Accounting Review*, 75(1), 43–63.
- Blankespoor, E., Dehaan, E., & Marinovic, I. (2020). Disclosure processing costs, investors' information choice, and equity market outcomes: A review. *Journal of Accounting and Economics*, 70(2–3) 101344.
- Blankespoor, E., Dehaan, E., Wertz, J., & Zhu, C. (2019). Why do individual investors disregard accounting information? The roles of information awareness and acquisition costs. *Journal of Accounting Research*, 57(1), 53–84.
- Blei, D. M., Ng, A. Y., & Jordan, M. I. (2003). Latent dirichlet allocation. *Journal of Machine Learning Research*, 3, 993–1022.
- Bloomfield, R. J. (2002). The "Incomplete revelation hypothesis" and financial reporting. *Accounting Horizons*, 16(3), 233–243.
- Bochkay, K., Hales, J., & Chava, S. (2020). Hyperbole or reality? Investor response to extreme language in earnings conference calls. *The Accounting Review*, 95(2), 31–60.
- Booker, A., Curtis, A., & Richardson, V. J. (2023). Investor disagreement, disclosure processing costs, and trading volume evidence from social media. *The Accounting Review*, 98(1), 109–137.
- Bowen, R. M., Davis, A. K., & Matsumoto, D. A. (2002). Do conference calls affect analysts' forecasts? *The Accounting Review*, 77(2), 285–316.
- Brown, L. D., Hugon, A., & Pope, P. F. (2009). The effect of earnings surprises on information asymmetry: A meta-analysis. *Review of Accounting Studies*, 14, 746–769.
- Brown, N. C., Crowley, R. M., & Elliott, W. B. (2020). What are you saying? Using topic to detect financial misreporting. *Journal of Accounting Research*, 58(1), 237–291.
- Brown, S., & Hillegeist, S. A. (2007). How disclosure quality affects the level of information asymmetry. *Review of Accounting Studies*, 12(2–3), 443–477.
- Brown, S., Hillegeist, S. A., & Lo, K. (2004). Conference calls and information asymmetry. *Journal of Accounting and Economics*, 37(3), 343–366.
- Bushee, B. J., Core, J. E., Guay, W., & Hamm, S. J. (2010). The role of the business press as an information intermediary. *Journal of Accounting Research*, 48(1), 1–19.
- Bushee, B. J., Gow, I. D., & Taylor, D. J. (2018). Linguistic complexity in firm disclosures: Obfuscation or information? *Journal of Accounting Research*, 56(1), 85–121.
- Call, A. C., Hewitt, M., Watkins, J., & Yohn, T. L. (2021). Analysts' annual earnings forecasts and changes to the I/B/E/S database. *Review of Accounting Studies*, 26(1), 1–36.
- Chang, J., Boyd-Graber, J., Gerrish, S., Wang, C., & Blei, D. M. (2009). Reading tea leaves: How humans interpret topic models. In *Advances in neural information processing systems* 22 (pp. 288–296). Curran Associates, Inc.
- Chen, J. V., Nagar, V., & Schoenfeld, J. (2018). Manager-analyst conversations in earnings conference calls. *Review of Accounting Studies*, 23(4), 1315–1354.
- Chen, X., Cheng, Q., & Lo, K. (2010). On the relationship between analyst reports and corporate disclosures: Exploring the roles of information discovery and interpretation. *Journal of Accounting and Economics*, 49(3), 206–226.
- Cicon, J. (2017). Say it again Sam: The information content of corporate conference calls. *Review of Quantitative Finance and Accounting*, 48(1), 57–81.
- Clement, M. B., & Tse, S. Y. (2005). Financial analyst characteristics and herding behavior in forecasting. *Journal of Finance*, 60(1), 307–341.
- Cohen, L., Lou, D., & Malloy, C. J. (2020). Casting conference calls. *Management Science*, 66(11), 5015–5039.
- Collins, D., Gong, G. W., & Hribar, P. (2003). Investor sophistication and the mispricing of accruals. *Review of Accounting Studies*, 8(2–3), 251–276.
- Comprix, J., Lopatta, K., & Tideman, S. A. (2022). The role of gender in the aggressive questioning of CEOs during earnings conference calls. *The Accounting Review*, 97(7), 79–107.

- Davis, A. K., Ge, W., Matsumoto, D., & Zhang, J. L. (2015). The effect of manager-specific optimism on the tone of earnings conference calls. *Review of Accounting Studies*, 20(2), 639–673.
- Diether, K. B., Malloy, C. J., & Scherbina, A. (2002). Differences of opinion and the cross section of stock returns. *The Journal of Finance*, 57(5), 2113–2141.
- Dyer, T., Lang, M., & Stice-Lawrence, L. (2017). The evolution of 10-K textual disclosure: Evidence from Latent Dirichlet allocation. *Journal of Accounting and Economics*, 64(2–3), 221–245.
- Frederickson, J. R., & Zolotoy, L. (2016). Competing earnings announcements: Which announcement do investors process first? *The Accounting Review*, 91(2), 441–462.
- Garfinkel, J. A. (2009). Measuring investors' opinion divergence. *Journal of Accounting Research*, 47(5), 1317–1348.
- Glosten, L. R., & Harris, L. E. (1988). Estimating the components of the bid/ask spread. *Journal of Financial Economics*, 21(1), 123–142.
- Gomez, E. A. (2024). The effect of mandatory disclosure dissemination on information asymmetry among investors: Evidence from the implementation of the edgar system. *Accounting Review*, 99(1), 235–257.
- Grossman, S. J., & Stiglitz, J. E. (1980). On the impossibility of informationally efficient markets. *The American Economic Review*, 70, 393–408.
- Haag, J., Hofmann, C., Klausing, S., & Schwaiger, N. (2022). *Strike the right tone: Financial analysts' tone to acquire information in earnings conference calls*. TRR 266 Accounting for Transparency Working Paper Series.
- Haag, J., Hofmann, C., Paulus, A., Schwaiger, N., & Sellhorn, T. (2023). *Analysts' questions when peers are listening*. TRR 266 Accounting for Transparency Working Paper Series Revised September 2023.
- Harford, J., Jiang, F., Wang, R., & Xie, F. (2019). Analyst career concerns, effort allocation, and firms' information environment. *Review of Financial Studies*, 32(6), 2179–2224.
- Heinrichs, A., Park, J., & Soltes, E. F. (2019). Who consumes firm disclosures? Evidence from earnings conference calls. *The Accounting Review*, 94(3), 205–231.
- Hirshleifer, D., & Teoh, S. H. (2003). Limited attention, information disclosure, and financial reporting. *Journal of Accounting and Economics*, 36(1–3), 337–386.
- Hodge, F. D., Kennedy, J. J., & Maines, L. A. (2004). Does search-facilitating technology improve the transparency of financial reporting? *The Accounting Review*, 79(3), 687–703.
- Hollander, S., Pronk, M., & Roelofsens, E. (2010). Does silence speak? An empirical analysis of disclosure choices during conference calls. *Journal of Accounting Research*, 48(3), 531–563.
- Holthausen, R. W., & Verrecchia, R. E. (1990). The effect of informedness and consensus on price and volume behavior. *The Accounting Review*, 65(1), 191–208.
- Hope, O. K., & Wang, J. (2018). Management deception, big-bath accounting, and information asymmetry: Evidence from linguistic analysis. *Accounting, Organizations and Society*, 70, 33–51.
- Huang, A. H., Leavy, R., Zang, A. Y., & Zheng, R. (2018). Analyst information discovery and interpretation roles: A topic modeling approach. *Management Science*, 64(6), 2833–2855.
- Israeli, D., Kasznik, R., & Sridharan, S. A. (2021). Unexpected distractions and investor attention to corporate announcements. *Review of Accounting Studies*, 27, 1–42.
- Jegadeesh, N., & Kim, W. (2010). Do analysts herd? An analysis of recommendations and market reactions. *Review of Financial Studies*, 23(2), 901–937.
- Jiambalvo, J., Rajgopal, S., & Venkatachalam, M. (2002). Institutional ownership and the extent to which stock prices reflect future earnings. *Contemporary Accounting Research*, 19(1), 117–145.
- Jiang, W. (2017). Have instrumental variables brought us closer to the truth. *The Review of Corporate Finance Studies*, 6(2), 127–140.
- Kandel, E., & Pearson, N. D. (1995). Differential interpretation of public signals and trade in speculative markets. *Journal of Political Economy*, 103(4), 831–872.
- Kim, O., & Verrecchia, R. E. (1997). Pre-announcement and event-period private information. *Journal of Accounting & Economics*, 24(3), 395–419.
- Kimbrough, M. D. (2005). The effect of conference calls on analyst and market underreaction to earnings announcements. *The Accounting Review*, 80(1), 189–219.
- La Porta, R., Lopez-de Silanes, F., Shleifer, A., & Vishny, R. W. (1999). Corporate ownership around the world. *The Journal of Finance*, 54(2), 471–517.
- Larcker, D. F., & Zakolyukina, A. A. (2012). Detecting deceptive discussions in conference calls. *Journal of Accounting Research*, 50(2), 495–540.
- Lee, C. M., & Zhong, Q. (2022). Shall we talk? The role of interactive investor platforms in corporate communication. *Journal of Accounting and Economics*, 74(2–3), 101524.
- Lee, J. (2016). Can investors detect managers' lack of spontaneity? Adherence to predetermined scripts during earnings conference calls. *Accounting Review*, 91(1), 229–250.

- Lehavy, R., Li, F., & Merkley, K. (2011). The effect of annual report readability on analyst following and the properties of their earnings forecasts. *The Accounting Review*, 86(3), 1087–1115.
- Leuz, C. (2003). IAS versus U.S. GAAP: Information asymmetry-based evidence from Germany's new market. *Journal of Accounting Research*, 41, 445–472.
- Li, F. (2008). Annual report readability, current earnings, and earnings persistence. *Journal of Accounting and Economics*, 45(2–3), 221–247.
- Loughran, T., & McDonald, B. (2016). Textual analysis in accounting and finance: A Survey. *Journal of Accounting Research*, 54(4), 1187–1230.
- Manning, C., & Schütze, H. (1999). *Foundations of statistical natural language processing*. MIT Press.
- Matsumoto, D., Pronk, M., & Roelofsen, E. (2011). What makes conference calls useful? The information content of managers' presentations and analysts' discussion sessions. *The Accounting Review*, 86(4), 1383–1414.
- Mayew, W. J. (2008). Evidence of management discrimination among analysts during earnings conference calls. *Journal of Accounting Research*, 46(3), 627–659.
- Mayew, W. J., Sethuraman, M., & Venkatachalam, M. (2020). Individual analysts' stock recommendations, earnings forecasts, and the informativeness of conference call question and answer sessions. *The Accounting Review*, 95(6), 311–337.
- Mayew, W. J., & Venkatachalam, M. (2012). The power of voice: Managerial affective states and future firm performance. *Journal of Finance*, 67(1), 1–43.
- McCallum, A. K. (2002). MALLET: A machine learning for language toolkit. Retrieved November 2025, from <http://mallet.cs.umass.edu>.
- Milian, J. A., & Smith, A. L. (2017). An investigation of analysts' praise of management during earnings conference calls. *Journal of Behavioral Finance*, 18(1), 65–77.
- Peng, Z., Johnstone, D., & Christodoulou, D. (2020). Asymmetric impact of earnings news on investor uncertainty. *Journal of Business Finance and Accounting*, 47(1–2), 3–26.
- Price, S. M. K., Doran, J. S., Peterson, D. R., & Bliss, B. A. (2012). Earnings conference calls and stock returns: The incremental informativeness of textual tone. *Journal of Banking and Finance*, 36(4), 992–1011.
- Rennekamp, K. M., Sethuraman, M., & Steenhoven, B. A. (2022). Engagement in earnings conference calls. *Journal of Accounting and Economics*, 74(1), 101498.
- Sloan, R. G. (1996). Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review*, 71(3), 289–315.
- Tetlock, P. C. (2011). All the news that's fit to reprint: Do investors react to stale information? *The Review of Financial Studies*, 24(5), 1481–1512.
- Trueman, B. (1994). Analyst forecasts and herding behavior. *The Review of Financial Studies*, 7(1), 97–124.
- Verrecchia, R. E. (1982). Information acquisition in a noisy rational expectations economy. *Econometrica: Journal of the Econometric Society*, 50(6), 1415–1430.
- Welch, I. (2000). Herding among security analysts. *Journal of Financial Economics*, 58(3), 369–396.
- You, H., & Zhang, X.j. (2009). Financial reporting complexity and investor underreaction to 10-K information. *Review of Accounting Studies*, 14(4), 559–586.