Earnings Surprises, Mispricing, and the Dispersion Anomaly*

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Abstract

Firms with high dispersion in analyst earnings forecasts tend to earn relatively low future stock returns. We examine whether investors' inability to unravel differences in firms' propensity to meet earnings expectations explains this phenomenon. We first demonstrate that the return predictability of forecast dispersion is concentrated only around earnings announcement dates. Next, we find that the return predictability of dispersion is driven by the component of dispersion that is explained by measures of expected analyst forecast pessimism and firms' expectations management incentives. These results are not a reflection of other factors such as differences of opinion, firms' exposure to earnings announcement premia, and short-sale constraints. Overall, we conclude that the forecast dispersion anomaly can be explained by investor mispricing of firms' participation in the earnings surprise game.

Keywords: Earnings announcements, sell-side analysts, forecast bias, expectations management, mispricing, forecast dispersion, earnings surprises.

JEL Classifications: D80, G12, G14, G24, M41.

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1. Introduction

Earnings announcements trigger significant stock price revisions each quarter. An important part of these revisions is due to the surprise in earnings relative to sell-side analyst expectations (e.g., Brown et al. [1987]; Easton and Zmijewski [1989]; Kinney et al. [2002]; Skinner and Sloan [2002]). Investors' ability to accurately process and price the information in analysts' forecasts therefore has important implications for the price discovery process around earnings announcements. To the extent that these forecasts are noisy or biased, investors' failure to fully adjust earnings expectations for predictable errors can harm the price discovery process and lead to predictable variation in stock returns (e.g., So [2013]; Veenman and Verwijmeren [2018]; Berger et al. [2019]; Johnson et al. [2019]). In this paper, we propose that investors' inability to fully debias analysts' earnings forecasts explains a return-predictability phenomenon known as the dispersion anomaly.

The dispersion anomaly reflects the puzzling result that firms with high dispersion in analyst earnings forecasts earn significantly lower stock returns than firms with low dispersion (Diether et al. [2002]). This return predictability is surprising in the sense that high disagreement firms are arguably risky, but they earn relatively low future returns. Our motivation to propose an explanation based on investors' inability to fully debias earnings forecasts stems from the observation that the strategic interaction between managers and analysts typically causes analysts' forecasts to become pessimistic shortly before earnings announcements. Because of these pessimistic forecasts, the majority of firms consistently meet expectations (e.g., Richardson et al. [2004]; Ke and Yu [2006]; Chan et al. [2007]; Hilary and Hsu [2013]; Zweig [2018]). We argue that this strategic interaction, also known as the earnings surprise game, induces a negative relation between forecast dispersion and firms' propensity to meet current-quarter earnings expectations.

Specifically, prior research suggests that managers have strong incentives to take actions that prevent them from missing analysts' earnings expectations (e.g., Graham et al. [2005]). While one strategy to achieve this goal is to manage earnings to meet the consensus forecast

(Abarbanell and Lehavy [2003]; Jackson and Liu [2010]; Chu et al. [2019]), another pervasive strategy is to manage the information set available to analysts and steer their expectations down to beatable levels (Bartov et al. [2002]; Matsumoto [2002]; Gryta et al. [2016]; Cheong and Thomas [2018]; Johnson et al. [2019]). Whether this expectations management is done through public or private communication, this strategic behavior of managers is likely to increase the precision of analysts' information (e.g., Clement et al. [2003]; Cotter et al. [2006]). Because forecast dispersion is an inverse measure of the precision of analysts' information, we argue that expectations management leads to a negative association between forecast dispersion and firms' propensity to meet earnings expectations.

In addition, in attempts to curry favor with firm managers, analysts have incentives to take their cues from management and strategically bias their short-term forecasts downwards to beatable levels (e.g., Ke and Yu [2006]; Feng and McVay [2010]; Hilary and Hsu [2013]). Recent research suggests that this strategic forecasting varies predictably with forecast dispersion. For instance, Bissessur and Veenman [2016] find that analysts are better able to induce a small pessimistic bias when forecast uncertainty (dispersion) is relatively low and Berger et al. [2019] find that analysts' strategic omission from positive information from their earnings forecasts, to increase the probability that firms meet these expectations, reduces forecast dispersion. Hilary and Hsu [2013] suggest that analysts minimize the volatility of their pessimistically biased forecasts, which also reduces forecast uncertainty and dispersion.

Combined, these arguments suggest that firms with higher (lower) forecast dispersion are associated with a lower (higher) probability of meeting analyst earnings expectations.[1] If investors fully anticipate and price these differences in probabilities across firms, forecast dispersion should not be associated with predictable differences in stock returns around earnings announcements. Yet, recent evidence presented by Veenman and Verwijmeren [2018]

[1]Descriptive evidence in prior research confirms this prediction. For example, empirical results in Barton and Simko [2002], Heflin and Hsu [2008], and Jiang et al. [2010] reveal significant negative correlations between firms' meeting of earnings expectations and control variables related to forecast dispersion. Focusing on small earnings surprises, Bissessur and Veenman [2016] find that low (high) dispersion firms are significantly more likely to beat (miss) expectations by a small amount.

and Johnson et al. [2019] suggests that investors face difficulty in unraveling differences in the *conditional* probability that firms meet expectations. If investors similarly fail to fully anticipate these differences in probabilities for firms with high and low forecast dispersion, the variation in firms' tendency to meet earnings expectations should provide a plausible explanation for the dispersion anomaly.

For a large sample of firms over the period 1993–2018, we first replicate the result that high dispersion firms have significantly lower future stock returns than low dispersion firms. We demonstrate that this effect is concentrated in earnings announcement months, with low annual earnings forecast dispersion firms earning 0.79 percentage points higher returns compared to high dispersion firms. Similar results are found when forecast dispersion is measured based on quarterly earnings forecasts (0.68 percentage points). More importantly, we find significant return spreads *only* around earnings announcement dates (three-day return differences of 0.67 and 0.65 percentage points, respectively), while monthly returns that exclude the earnings announcement window are not significantly associated with forecast dispersion.[2]

The predictable differences in earnings announcement returns based on forecast dispersion are robust to controlling for a wide range of other predictive firm characteristics associated with dispersion. In addition, we find that the relation between dispersion and announcement returns is not explained by other common measures of differences of opinion among investors (Berkman et al. [2009]). In cross-sectional tests, we demonstrate that the announcement return predictability is concentrated among those firms with the highest frequency of meeting consensus analyst expectations in prior periods. Combined, these results thus far suggest that the dispersion anomaly is a unique phenomenon that materializes around earnings

[2]These results are more consistent with mispricing explanation than a risk-based explanation for the return predictability, since expected returns should be relatively small over the short announcement windows we examine (see Bernard et al. [1997]; La Porta et al. [1997]; Lewellen [2010]; Richardson et al. [2010]). Nevertheless, in Section 5.1 we do examine whether the return predictability around earnings announcements is caused by firms' exposure to earnings announcement premia, since Patton and Verardo [2012] and Savor and Wilson [2016] find that earnings announcements increase firms' exposure to systematic risk. In our tests, we find that our results are not consistent with differences in firms' exposure to earnings announcement premia explaining the return differences in short windows around earnings announcements.

announcements and that it is moderated by firms' propensity to participate in the earnings surprise game.

Next, we provide more direct evidence on the role of investor mispricing of firms' propensity to meet earnings expectations. We first confirm that low (high) dispersion firms are substantially more (less) likely to meet analysts' quarterly earnings expectations. To better understand the source of this negative relation between dispersion and meeting expectations, we rely on two ex-ante measures of the likelihood that firms meet earnings expectations. Following Veenman and Verwijmeren [2018] and Johnson et al. [2019], we use measures of expected analyst forecasts pessimism and firms' incentives to manage expectations, respectively. While these measures capture differences in firms' propensity to meet current-quarter earnings expectations *and* they predict subsequent earnings announcement returns, we also find that they are negatively associated with forecast dispersion. In other words, consistent with our prediction, we find that firms more prone to forecast pessimism and expectations management are associated with lower forecast dispersion.

We continue by examining the extent to which this association helps explain the dispersion anomaly. Specifically, we use a two-stage approach in which we first decompose forecast dispersion measures into components that are explained versus unexplained by the ex-ante measures of forecast pessimism and expectations management. In the second stage, we separately regress announcement returns on these orthogonal components and control variables. Doing so, we find that the portion of the variation in dispersion that relates to the probability that firms participate in the earnings surprise game explains the predictive ability of dispersion for announcement returns. For the residual component of forecast dispersion that is unexplained by the two measures, we do not find a significant negative relation with announcement returns.

Because these ex-ante measures capture differences in the conditional probability that firms meet expectations, the empirical results are consistent with the prediction that investor mispricing of short-term earnings expectations explains the relation between forecast dispersion and earnings announcement returns. Combined with the result that return predictability is concentrated only around earnings announcements and only among firms that are most likely to participate in the earnings surprise game, we conclude that investors' mispricing of earnings expectations indeed provides a viable explanation for the forecast dispersion anomaly.

Overall, this study contributes to the literature on the market pricing effects of the earnings surprise game played by managers and analysts (e.g., Bartov et al. [2002]; Kasznik and McNichols [2002]; Skinner and Sloan [2002]; Brown and Caylor [2005]; Keung et al. [2010]). Recent evidence in this literature suggests that investors do not fully undo strategic biases in managers' reporting and analysts' forecasting, thereby mispricing the probability that firms meet current-quarter earnings expectations (Ma and Markov [2017]; Veenman and Verwijmeren [2018]; Berger et al. [2019]; Johnson et al. [2019]). We demonstrate that forecast dispersion is associated with differences in the likelihood that firms participate in the earnings surprise game and that this explains another pervasive phenomenon, known as the dispersion anomaly.

As such, this study also contributes to the literature on the dispersion anomaly. Diether et al. [2002] and Berkman et al. [2009] interpret forecast dispersion as a proxy for differences of opinion and argue that the explanation for the anomaly follows from Miller [1977]'s theory, which suggests that the combination of short-sale constraints and differences in investors' opinions leads to overpricing and negative future stock returns. Other studies challenge this conclusion and provide a variety of alternative risk- and mispricing-based explanations for the phenomenon. We demonstrate that our results are not explained by other common measures of differences of opinion, differences in firms' exposure to earnings announcement premia, and short-sale constraints, but represent a novel explanation.[3]

[3]In addition to contributing to the specific literature on the dispersion anomaly, our study contributes to the stream of literature that examines the market pricing effects of information uncertainty more generally (e.g., Jiang et al. [2005]; Zhang [2006]; Donelson and Resutek [2015]). We demonstrate how the mispricing of earnings expectations explains the return predictability of forecast dispersion, a common measure of information uncertainty.

Besides the role of short-sale constraints, Diether et al. [2002] conjecture that sell-side analysts' incentives for forecast optimism, combined with their self-selection in coverage of firms (e.g., McNichols and O'Brien [1997]), may explain the dispersion anomaly. Grinblatt et al. [2018] similarly argue that analyst optimism is a likely explanation for a wide range of popular anomalies. However, an explanation based on optimistic forecast bias is difficult to reconcile with the tendency for analysts' short-term forecasts to be pessimistic once earnings are announced.[4] In our study, we focus on how investor mispricing of the likelihood that a firm meets analysts' *pessimistic* earnings expectations explains the predictive ability of dispersion for earnings announcement returns. We conclude that pessimistic analyst forecasts and investors' inability to fully debias these forecasts play an important role in explaining the forecast dispersion anomaly.

2. Background and predictions

2.1. The dispersion anomaly

Diether et al. [2002] find that firms with high dispersion in analysts' earnings forecasts are associated with significantly lower future stock returns than firms with low dispersion in forecasts.[5] This result is puzzling because high dispersion firms are arguably risky, but they have relatively low returns. Interpreting forecast dispersion as a proxy for differences of opinion, Diether et al. [2002] conclude that this result is consistent with Miller [1977]. Specifically, Miller [1977] predicts that when investors have differences of opinion about the valuation of a firm, short-sale constraints keep the relatively pessimistic investors from trading the stock. The overpricing induced by this effect increases in differences of opinion and leads to lower stock returns when the overpricing is subsequently corrected.

[4] On average, earnings forecasts are overly optimistic when measured more than a quarter ahead of a firm's earnings announcement, while they become pessimistic during the quarter before the earnings announcement (e.g., Richardson et al. [2004]). While optimistic bias in longer-term forecasts can boost prices and lead to negative returns when pricing errors are gradually corrected, the short-term forecasts more directly affect firms' earnings surprises and the returns realized around earnings announcements.

[5] In reviewing the accounting anomalies literature, Richardson et al. [2010] identify this study as the third most actively cited in recent years.

Evidence presented by Berkman et al. [2009] suggests that earnings announcements provide a venue through which the overpricing induced by differences of opinion can be resolved. They argue that the combination of differences of opinion and short-sale constraints leads to price increases before earnings announcements and to price decreases following earnings announcements when differences of opinion are resolved. Using five proxies for differences of opinion (including forecast dispersion), they find predictable return differences around earnings announcements but do not examine the implications of these results for the overall return predictability of the measures.[6]

Several studies debate the Miller [1977] interpretation of the dispersion anomaly. For example, Johnson [2004] provides a risk-based explanation based on option-pricing theory and argues that dispersion captures idiosyncratic information risk that increases the option value of the firm. He predicts and finds that for a levered firm, higher levels of idiosyncratic asset risk reduce expected returns. Avramov et al. [2009] find that forecast dispersion is correlated with financial distress and conclude that the return predictability of dispersion is driven by the low future returns associated with weak credit ratings, while Sadka and Scherbina [2007] find that high dispersion coincides with high trading costs and that firms with less liquid stocks tend to be more overpriced. Combined, these results suggest investors do not fully anticipate the low returns associated with weak credit ratings, and that trading costs hinder the overpricing from being arbitraged away.

While Diether et al. [2002] and Berkman et al. [2009] interpret the dispersion in analysts' forecasts as a measure of differences of opinion, Garfinkel [2009] concludes that forecast dispersion is a poor measure of differences of opinion among investors. In this regard,

[6] Interestingly, the empirical results in Berkman et al. [2009] on forecast dispersion are less consistent with their predictions than those based on their other measures of differences of opinion. In tests presented in Sections 5.2 and 5.1, we confirm this discrepancy and conclude that forecast dispersion captures a different construct that has unique implications for announcement returns. Doing so, we also contribute to the literature on the factors associated with earnings announcement premia. Several studies find that firms experience significant price increases in the days before earnings announcements as a result of pre-announcement uncertainty (Barber et al. [2013]; Savor and Wilson [2016]), which reverse after earnings are announced (Johnson and So [2018]). We demonstrate that several common measures of differences of opinion predictably map into these return patterns, but that the negative relation between forecast dispersion and announcement returns is not explained by the reversal of pre-announcement price increases.

Doukas et al. [2006] and Barron et al. [2009] recognize that dispersion also captures forecast uncertainty and based on the framework of Barron et al. [1998], they separate dispersion into components related to differences of opinion and forecast uncertainty, respectively. They find that a measure of differences of opinion that is free from the effect of uncertainty is positively related to future returns, while the uncertainty component is negatively related to future returns. In line with Johnson [2004], both studies conclude that the negative association of forecast uncertainty with future returns is consistent with option pricing theory in which greater idiosyncratic uncertainty increases option values and thereby lowers expected returns.

In this study, we similarly recognize that analyst forecast dispersion captures more than just differences of opinion among investors. Although not a complete measure, forecast dispersion is widely accepted as a proxy for earnings forecast uncertainty (e.g., Imhoff and Lobo [1992]; Barron et al. [1998]; Kinney et al. [2002]; Clement et al. [2003]; Lahiri and Sheng [2010]). In contrast to prior work, however, we argue that predictable variation in sell-side analyst forecast pessimism and managers' use of expectations management, and the resulting increased likelihood that firms meet expectations, plays an important role in explaining the return predictability of forecast dispersion. We explain our argumentation in more detail below.

2.2. Dispersion, earnings surprise predictability, and investor reactions to earnings news

Besides the role of short-sale constraints, Diether et al. [2002] argue that any friction that prevents the revelation of negative opinions in prices may explain the predictive ability of forecast dispersion for future returns. They conjecture that sell-side analysts' incentives for forecast optimism, combined with their self-selection in coverage of firms (e.g., McNichols and O'Brien [1997]), provides such a friction. The resulting optimistic bias in market earnings expectations subsequently corrects over time, which induces negative return patterns.[7]

[7] Hwang and Li [2017] similarly argue that the relation between forecast dispersion and future returns, which they find extends to a large international sample of firms, is consistent with analysts' incentives for forecast optimism and the self-selection in coverage.

However, such an explanation based on forecast optimism, which is common for analysts' longer-term forecasts, is difficult to reconcile with the tendency for analysts' short-term forecasts to be too pessimistic, leading the majority of firms to meet these expectations (e.g., Richardson et al. [2004]; Ke and Yu [2006]; Chan et al. [2007]; Zweig [2018]).

We propose an alternative explanation for the return predictability of forecast dispersion that is based on predictable bias in earnings expectations and earnings surprises, and investors' inability to fully undo this bias in setting earnings expectations and processing earnings news. Interpreting forecast dispersion as a measure of forecast uncertainty, or the lack of precision in analysts' information, we argue that the combination of managers' expectations management incentives and analysts' strategic issuance of beatable earnings targets induces a predictable negative relation between forecast dispersion and firms' propensity to meet quarterly earnings expectations, for the following reasons.

First, managers have incentives to use expectations management tactics to lower consensus analyst forecasts to beatable targets (e.g., Bartov et al. [2002]; Matsumoto [2002]; Cheong and Thomas [2018]; Johnson et al. [2019]). These tactics, whether pursued via public or private guidance, are likely to increase the precision of analysts' information. For example, Cotter et al. [2006] demonstrate that managers can use downward guidance to lower the consensus forecast and increase the likelihood their firm will meet analysts' expectations. At the same time, they find that the provision of guidance is associated with lower dispersion in analysts' forecasts, which is consistent with studies such as Clement et al. [2003] that find that earnings guidance reduces forecast uncertainty and, consequently, forecast dispersion. Hence, when firms manage analysts' earnings expectations to beatable levels through downward guidance, this induces a predictable negative association between forecast dispersion and the likelihood that firms meet analysts' earnings expectations.

Second, analysts value their connections and access to management (e.g., Green et al. [2014]; Malmendier and Shanthikumar [2014]; Brown et al. [2015]; Kirk and Markov [2016]) and managers reward analysts for strategically issuing favorable opinions and beatable forecasts (e.g., Mayew [2008]; Ke and Yu [2006]; Hilary and Hsu [2013]). Based on the insights from prior research, we argue that such strategic behavior varies predictably with forecast uncertainty. For instance, Hilary and Hsu [2013] find that analysts gain informational advantages from issuing consistently pessimistic forecasts. By minimizing the volatility of their forecast errors and through their access to more precise information from management, this strategic behavior should reduce the overall level of forecast uncertainty and, hence, forecast dispersion. Berger et al. [2019] find that analysts' strategic omission of information from earnings forecasts to help firms meet expectations also reduces forecast dispersion, while Bissessur and Veenman [2016] find that analysts are better able to induce a small pessimistic bias in forecasts when forecast dispersion is low.

Combined, these arguments suggest that forecast dispersion, as a measure of forecast uncertainty, should be negatively related to the likelihood that firms meet current-quarter earnings expectations.[8] In other words, this means that investors should be able to use variation in forecast dispersion across firms to predict which firms are more versus less likely to report a positive earnings surprise, and to adjust their assessments of the "news" in earnings announcements. Whether investors anticipate, and correctly price, this predictability of earnings surprises is an open question. On the one hand, Keung et al. [2010] find that investors at least partly understand the relatively high probability that an average firm will meet analysts' earnings expectations (e.g., that each earnings season, about two-thirds of firms report positive earnings surprises). On the other hand, we argue that it is not clear that investors look beyond the consensus forecast and use more granular information on individual analyst forecasts or higher-order moments of forecasts, such as dispersion, to assess variation in firms' propensities to meet earnings expectations.[9]

[8]In addition, these effects are likely reinforced by the relation between forecast dispersion and the sensitivity of stock prices to earnings news. Kinney et al. [2002] find that stock prices react more strongly to earnings news when forecast uncertainty is low. This increased sensitivity of prices to earnings news further increases managers' and analysts' incentives to take actions that increase the probability that firms meet analyst expectations.

[9]Evidence in prior research does suggest that, at least to some extent, investors pay attention to the forecasts of individual analysts (e.g., Stickel [1992]; Mikhail et al. [1997]; Kirk et al. [2014]). However, in contrast to the consensus forecast and recent history of earnings surprises (e.g., Lawrence et al. [2017];

Insights from Bloomfield [2002] and Hirshleifer and Teoh [2003] suggest that investors may not fully appreciate this granular and more detailed information due to their limited attention and information processing constraints. Instead, investors are more likely to rely on simple statistics such as, in this context, the fraction of all firms that beat versus missed expectations in recent quarters. Bloomfield [2002] posits that even if investors are rational, the costs of extracting firm-specific information deter prices from fully reflecting all information and that information that is more costly to process will be less completely captured in prices. In the context of our study, we argue that it is more difficult for investors to infer the conditional, rather than the unconditional, probability that a firm will meet analysts' earnings expectations.

In recent work, Veenman and Verwijmeren [2018] find that investors fail to fully undo the predictable pessimistic bias in analysts' forecasts. They demonstrate that measures of analysts' past forecast errors predict both the sign of the current quarter earnings surprise and the market reaction to the earnings announcement. They also find that the predictability of earnings announcement returns strengthens with the complexity of investors' ex-ante assessment of the probability that firms meet expectations, which is consistent with theories of investors' limited attention and information processing constraints. Johnson et al. [2019] similarly find that ex-ante measures of firms' incentives to manage earnings expectations predict earnings announcement returns, consistent with investors failing to see through the effects of these incentives. In a similar vein, Berger et al. [2019] conclude that analysts' strategic omission of information from their forecasts induces predictable variation in earnings announcement returns.[10]

Overall, our study relies on the notion that forecast dispersion is negatively related to firms' propensity to meet earnings expectations due to managers' and analysts' strategic behavior, and that investors are unable to fully anticipate the news in earnings announcements.

Veenman and Verwijmeren [2018]), information on individual analysts' forecasts or forecast dispersion is not readily available to all investors through platforms such as Yahoo Finance, Seeking Alpha, or CNBC.com.

[10] In a different setting, Balakrishnan et al. [2010] conclude that investors are limited in their ability to fully assess and price the conditional probability that a firm reports a loss in the future.

Combined with the typically substantial market reactions to firms' earnings surprises relative to sell-side analysts' forecasts (e.g., Brown et al. [1987]; Easton and Zmijewski [1989]; Kinney et al. [2002]; Skinner and Sloan [2002]), we predict that investors' mispricing of short-term earnings expectations provides a viable alternative explanation for the dispersion anomaly. We empirically test this prediction by examining the predictive ability of forecast dispersion for the returns in earnings versus non-earnings announcement months, in announcement versus non-announcement windows, and in particular by isolating the role of the probability that firms meet expectations in explaining the return predictability of dispersion.

3. Research design

3.1. Variable measurement

Before turning to our sample selection details, we outline the construction of several key variables. Following Diether et al. [2002], we measure the dispersion in analysts' earnings forecasts using the standard deviation of individual analysts' forecasts of annual earnings per share (EPS) obtained from the IBES Unadjusted Summary History files, scaled by the absolute value of the mean consensus forecast. In other words, the measure of dispersion equals the coefficient of variation of individual analysts' forecasts. For those cases where the mean consensus forecast is zero, $DispAnn_t$ is set equal to the maximum sample value. We measure dispersion in the month before we measure stock returns and the earnings announcement news. In addition, following Berkman et al. [2009], we similarly construct $DispQtr_t$ based on the standard deviation of analysts' quarterly earnings forecasts.

We compute a firm's quarterly earnings surprise ($Surprise_t$) as the difference between actual EPS for a firm-quarter, obtained from the IBES Unadjusted files, and the mean consensus forecast measured using each individual analyst's latest forecast from the IBES Unadjusted detail files. To construct this consensus forecast, we eliminate forecasts older than 180 days. In addition, we adjust forecasts for stock splits occurring between the forecast date and the earnings announcement date using the CRSP cumulative factor to adjust prices

(CFACPR).[11]

We identify firms' earnings announcement dates using the methodology described in Dellavigna and Pollet [2009] and pick the earliest of the Compustat and IBES earnings announcement dates. If a firm-quarter has different earnings announcement dates in Compustat and IBES and the databases disagree about the date by more than one day, we eliminate the observation from the sample. We also adjust announcements identified as occurring after market close (AMC) using the IBES timestamps to the subsequent trading day following Johnson and So [2018].

Given the procedures applied to identify the correct date of the earnings announcement, and the impact of return reversals on the returns measured during the earnings announcement window (Johnson and So [2018]), we measure the stock market reaction to earnings announcements starting on the day of announcement. Specifically, we measure $BHAR_t^{[0,2]}$ as the buy-and-hold size-adjusted stock returns for the firm-quarter, measured from the date of the earnings announcement through two days after the earnings announcement. Size-adjusted returns are computed relative to the CRSP value-weighted market capitalization index based on NYSE/AMEX/NASDAQ cutoffs (using CRSP file ERDPORT1).

To account for the potential influence of extreme observations on our results, we transform the independent variables in our regression analyses to decile ranks that are rescaled between -0.5 and 0.5, such that the coefficient on each variable captures the difference in average announcement returns between observations in the highest and lowest decile (e.g., Livnat and Mendenhall [2006]). In addition, we trim all return variables, when used as dependent variable or in the descriptive statistics in Tables 1 and 2, at the top and bottom 0.1 percent of the distribution.[12]

[11]Following Diether et al. [2002], we rely on the IBES data that is unadjusted for stock splits in order to properly identify cases where firms meet versus miss consensus analyst expectations. Relying on IBES data adjusted for splits, which are rounded to the nearest cent, would lead to a non-trivial number of observations being transformed to (rounded) 0¢ earnings surprises, while instead the firm met or missed the consensus forecast. We adjust the unadjusted forecasts for stock splits using CRSP split factors in order to better align the (unrounded) forecasts and actuals.

[12]While it is uncommon in the anomaly literature to trim (or winsorize) outliers given the introduction of a look-ahead bias, we take this step because our focus is on explaining an existing anomaly instead of

3.2. Data

Panel A of Table 1 presents the sample selection procedures. We start with an initial sample of 604,487 firm-quarters in the intersection of CRSP and Compustat that end in the calendar quarters 1993Q1 through 2018Q4. We drop firms without a listing on NYSE, AMEX, or NASDAQ, firms with quarter-end stock price below $1, and with missing earnings announcement dates in Compustat (RDQ). Next, we merge the CRSP/Compustat sample with firm-quarters in IBES and drop observations with missing earnings surprise ($Surprise_t$) data. Based on the identification of the earnings announcement dates described in the previous section, we eliminate a small set of observations with strongly delayed earnings announcements of more than 180 days after the fiscal quarter end.

Next, we match the sample of firm-quarters with daily stock returns available in the CRSP Indexes files to compute the stock price reaction to each earnings announcement and drop firms with missing announcement return data. After eliminating all firm-quarters with missing dispersion measures (which require a minimum of two analysts contributing to the consensus forecast in a month), as well as those with missing data on our control variables described later, we obtain a sample of 287,587 firm-quarter observations over the 1993Q1–2018Q4 period. For the tests presented in Tables 5 and 6 in which we use measures of prior analysts' forecast errors (Veenman and Verwijmeren [2018]) and expectations management incentives (Johnson et al. [2019]), this sample is further reduced to 263,665 and 147,404 firm-quarters, respectively, given the additional data restrictions.

Panel B of Table 1 presents insights on the sample composition over time. Most sample years contain between 10,000-12,000 observations, suggesting an average of around 2,500–

identifying a new implementable trading strategy. In our analyses, it is therefore essential to ensure the results are a reflection of average patterns in the data instead of being caused by a few extreme observations (as in, e.g., Kraft et al. [2006]). Our choice to trim only the top and bottom 0.1 percent of the variable's distribution is driven by our objective of minimizing the influence of extreme observations, while at the same time staying as close as possible to the original studies examining return predictability. To illustrate the importance of this procedure, untabulated descriptive statistics reveal that before trimming the extreme observations from the variable, the values of the announcement return variable ($BHAR_t^{[0,2]}$) range from -0.918 to 10.740. After trimming the top and bottom 0.1 percent, the remaining 99.8 percent of observations have values ranging from -0.465 to 0.507.

3,000 firms per quarter. For each of the sample years, we also observe that firms are substantially more likely to meet ($Surprise \geq 0$) than to miss ($Surprise < 0$) earnings expectations. On average, $Meet_t$ equals 1 for 67.5 percent of firm-quarters (untabulated). This frequency peaks at a high of 74.2 percent in 2002. Because $Meet_t$ includes cases in which analysts' forecast errors are zero, we also explore (untabulated) the frequency of positive versus negative earnings surprises and find that 63.0 percent of firm-quarters have a positive earnings surprise, while 37.0 percent have a negative surprise. We find that only in the first sample year (1993), the frequency of positive earnings surprises (49.8 percent) is slightly lower than that for negative surprises (50.2 percent).

Panel C provides descriptive insights on the overall frequency distribution of earnings surprises and the average market reactions for different earnings surprise bins. Consistent with prior research, the earnings surprise distribution displays a strong asymmetry around zero (Degeorge et al. [1999]; Brown [2001]; Abarbanell and Lehavy [2003]; Dechow et al. [2003]). That is, firms are substantially more likely to report small positive surprises instead of small negative surprises, which reflects a combination of managers' and analysts' strategic behavior. For example, 12.5 (9.4) percent of our sample observations have an earnings surprise equal to 1¢ (2¢) per share, while only 7.2 (4.8) percent have a surprise equal to –1¢ (–2¢) per share.

Also consistent with expectations and prior research, we find that market reactions to earnings announcements are positively associated with earnings surprises, and firms' missing of earnings expectations can trigger significant negative market reactions (Skinner and Sloan [2002]). In addition, the descriptive statistics in Panel C suggest that the average market reaction to earnings surprises of 0¢ is negative, and that there is an asymmetry in market reactions between small positive (e.g., 1¢: 0.1 percent) and small negative (e.g., –1¢: –1.7 percent) surprises. These insights are consistent with investors anticipating that most firms meet earnings expectations, and discounting small positive earnings surprises (Keung et al. [2010]).

4. Empirical results

4.1. Forecast dispersion and return predictability

In Table 2, we first present a re-examination of the general relation between forecast dispersion and future stock returns in our sample. We do this both using the original measure of dispersion from Diether et al. [2002] based on the monthly consensus forecast of annual earnings in Panel A, as well as the monthly consensus forecast of quarterly earnings in Panel B. This re-examination is important, because recent studies demonstrate that many return-predictive signals have lost their predictive power due to a combination of more liquid markets and general knowledge and exploitation of these signals following their initial publication (e.g., Green et al. [2011]; Chordia et al. [2014]; McLean and Pontiff [2016]).

Based on the firm-quarter sample constructed in Table 1, we generate a sample of firm-month observations by filling in the months in between firms' consecutive earnings announcements and attaching monthly return data from CRSP. For each month, we next attach the dispersion in analysts' annual and quarterly forecasts from the IBES Summary History files, measured in the previous month, and for each month in the sample we rank firms into quintile portfolios based on forecast dispersion. Because of our use of firm-quarters ending in calendar quarters 1993Q1 through 2018Q4, we focus the analyses on the 312 months from April 1993 through March 2019.

The first column of Panel A in Table 2 presents the time-series average of monthly returns for each of the quintile portfolios formed based on annual forecast dispersion.[13] Consistent with prior studies (Diether et al. [2002]; Nagel [2005]; Sadka and Scherbina [2007]), we find that low-dispersion firms earn significantly higher returns than high-dispersion firms. Firms in Q1 earn average returns of 1.13 percent, while firms in Q5 earn average returns of 0.61 percent. The average return difference between the low and high dispersion portfolios of 0.52 percent is statistically significant at the 0.10 level (p-value: 0.052). Although smaller

[13]Throughout the paper, standard errors of the average estimates are adjusted for autocorrelation using the Newey and West [1987] adjustment with five lags.

than the 0.79 percent reported originally in Diether et al. [2002], this result suggests that the dispersion anomaly exists even during our more recent sample period.[14] Results in Panel B using the quarterly dispersion measure provide similar insights (return difference of 0.43 percent, p-value: 0.028).

Out of the total sample, 33.0 percent of firm-months are identified as earnings announcement months. When we split the sample into earnings announcement (EA) and non-earnings announcement (non-EA) months, we find that significant return differences are found only in EA months. Based on annual (quarterly) forecast dispersion in Panel A (Panel B), return differences of 0.79 percent (0.68 percent) are statistically significant at the 0.01 level. Focusing instead on non-EA months, return differences are small and marginally significant at best (p-value of 0.098 in Panel B).

In line with Berkman et al. [2009], results in the next column reveal that forecast dispersion also predicts short-window return differences around firms' earnings announcements. In Panel A (Panel B), firms with low annual (quarterly) forecast dispersion have EA-window returns that are 0.67 percent (0.65 percent) higher compared to firms with high forecast dispersion. Importantly, a comparison of the full EA-month returns with the short-window returns suggests that the bulk of the return difference is concentrated around the earnings announcement. To further test this, we examine differences in average portfolio returns when monthly EA-month returns are adjusted for the short-window announcement returns. Doing so, we find that the EA-month return differences reduce to 0.09 and 0.07 percent in Panels A and B, respectively, and are no longer statistically significant.

These results suggest that the return predictability of forecast dispersion is a phenomenon that materializes *only* around earnings announcements. While Berkman et al. [2009] similarly find return differences based on dispersion around earnings announcements, our results suggest that the predictability of announcement returns drives the broader dispersion

[14]When we perform calendar time portfolio regressions based on the Fama-French four- and five-factor models to control for potential risk factors in explaining the return differences, we find (untabulated) that the monthly abnormal return differences (alphas) equal 0.64 and 0.41, respectively, and become statistically more significant after controlling for exposure to the factor portfolios (t-values of 4.04 and 2.65, respectively).

anomaly. Returning to the importance of understanding the robustness of the overall return predictability of forecast dispersion during our recent sample period, in Figure 1 we plot the quarterly average spreads in earnings announcement returns between firms in the low (Q1) and high (Q5) forecast dispersion quintiles. With 79 of the 104 quarters (76.0 percent) of quarters displaying a positive return spread, the results in Figure 1 highlight the robustness of the return predictability even after the substantial increases in market liquidity since the early 2000s (such as the decimalization of stocks in 2001, see Chordia et al. [2014]). In addition, Figure 1 highlights how persistent the high frequency of firms meeting or beating analyst earnings expectations has been over the sample period.

In the rightmost columns of Panels A and B, we present the average frequency with which firms report earnings that meet analyst expectations. $Meet_t$ is an indicator variable set equal to 1 if the earnings surprise for the quarter is nonnegative (i.e., $Surprise_t \geq 0$), and 0 otherwise. Consistent with descriptive evidence in prior studies (e.g., Barton and Simko [2002], Heflin and Hsu [2008], and Jiang et al. [2010]) and the predicted link between forecast dispersion and the likelihood that firms meet expectations, low-dispersion firms are associated with a 24 to 26 percentage point higher probability of meeting earnings expectations compared to high-dispersion firms. Combined with the result that the return predictability of dispersion is concentrated around earnings announcement dates, this result confirms that investors' mispricing of earnings expectations can indeed provide a plausible explanation for the dispersion anomaly.

Figure 2 provides additional evidence on the relation between forecast dispersion and firms' propensity to meet earnings expectations. For the firms in portfolios Q1 (low dispersion) and Q5 (high dispersion), we separately plot the frequency distribution of earnings surprises. As becomes clear, low-dispersion firms have a substantially stronger asymmetry in the earnings surprise distribution compared to high-dispersion firms. We find that low-dispersion firms are more likely to just meet quarterly earnings expectations, while high-dispersion firms are more likely to just miss expectations. The striking difference in the frequency distributions underscores the strong association between the level of forecast dispersion and firms' propensity to meet earnings expectations.

4.2. Cross-sectional regressions explaining market reactions to earnings announcements

In this section, we test the relation between market reactions to earnings announcements ($BHAR_t^{[0,2]}$) and dispersion after controlling for other factors associated with announcement returns. We control for standard firm characteristics such as size ($Size_t$), book-to-market (BtM_t), leverage (Lev_t), firm age (Age_t), analyst coverage ($Analysts_t$), and institutional ownership ($Inst_t$). Because dispersion is a measure of information uncertainty before earnings announcements, we also include separate variables for the daily (size-adjusted) abnormal returns before the earnings announcement to control for return reversals that are caused by liquidity providers shielding themselves from increased inventory risks before earnings announcements (So and Wang [2014]; Levi and Zhang [2015]). We include separate variables for the five daily abnormal returns before the earnings announcement date ($AR_t^{[-\tau]}$), as well as the buy-and-hold abnormal returns measured from day -10 through -6 ($BHAR_t^{[-10,-6]}$).

We also separately control for three measures of differences of opinion examined by Berkman et al. [2009]: the standard deviation of daily returns measured over the period from 55 through 11 days before the earnings announcement ($Retvol_t$); the volatility of earnings in the 20 quarters before the earnings announcement ($Evol_t$); and turnover, measured as the average daily ratio of trading volume to shares outstanding in the window from 55 through 11 days before the earnings announcement ($Turn_t$).[15] We include these additional controls to test whether the predictive-ability of forecast dispersion for announcement returns is unique and incremental to other common measures of differences of opinion.

Table 3 presents results from quarterly cross-sectional Fama and MacBeth [1973] regressions. The results from regressions of announcement returns on forecast dispersion alone

[15] Berkman et al. [2009] also use firm age as one of their measures of differences of opinion. Because of the ambiguous nature of firm size as measure of differences of opinion, we include firm age (Age_t) as a regular firm-characteristic control variable in the regressions.

reveal strong and significant differences in announcement returns between high- and low-dispersion firms. For example, based on the annual dispersion measure, low-dispersion firms have three-day announcement returns that are 75 basis points higher than for high-dispersion firms. Including additional firm characteristics and previous daily return variables as controls in the second and fifth columns, these return difference remain remarkably stable and significant. It is only when we include the additional differences of opinion variables in the third and sixth columns that we find the return difference becomes somewhat smaller. This result suggests that the dispersion variables partly capture the same construct as the other variables for differences of opinion, and that these variables share predictive power for announcement returns. That said, the return differences between low and high dispersion firms remain significant over the short window (33 and 30 basis points based on annual and quarterly dispersion, respectively, with t-statistics of 3.68 and 4.28).

In addition, it is important to note that controlling for these measures of differences of opinion provides a conservative estimate of the return differences associated with dispersion. For example, the (pooled-sample) Spearman correlation between the annual forecast dispersion measure and earnings volatility equals 0.3491 and both variables at least partly capture the underlying construct of forecast uncertainty. Similar to dispersion, earnings volatility can relate to both forecast uncertainty and the likelihood of meeting expectations when firms smooth earnings over time. In this case, controlling for earnings volatility therefore takes out part of the relevant predictive ability of dispersion for announcement returns. Nevertheless, we include these variables in the remainder of our analyses in order to demonstrate what drives the unique return predictability of dispersion.

4.3. Return predictability and firms' tendency to meet earnings expectations

If investor mispricing of firms' propensity to participate in the earnings surprise game explains the dispersion anomaly, we should observe the predictability of earnings announcement returns to be concentrated among firms that are most likely to do so. To test this conjecture, we partition our sample based on firms' recent history of meeting or beating analysts' earnings forecasts. Specifically, for all firm-quarters in our sample, we compute the fraction of the previous 12 quarters in which the firm has met or beaten the consensus analyst forecast. Next, we split the sample into firms that previously met expectations more than two-thirds of the time versus all other firms.

This split of firm-quarters results in almost equally-sized samples in which the firms with a low past frequency of meeting or beating expectations, on average, met expectations 48.8 percent of the time, while the high-frequency firms met expectations on average 87.3 percent of the time (untabulated). Moreover, while the low-frequency firms meet *current*-quarter expectations in 57.4 percent of observations, the high frequency firms do so more frequently at 77.3 percent (untabulated). This large difference in propensity to meet current-quarter expectations suggests our split is effective in separating firms that are more versus less likely to participate in the earnings surprise game.

Table 4 presents results of our earnings announcement return regressions after we split the sample into firms with high versus low past frequencies of meeting or beating expectations. Consistent with our conjecture, we find that significant return differences based on the level of dispersion can be found only for those firms with a high past frequency of meeting or beating analyst expectations. The high-frequency firm sample displays highly significant return spreads of 42 and 46 basis points using annual and quarterly dispersion, respectively. For the low-frequency firms, returns spreads are small (15 and 6 basis points, respectively) and not significant.

Overall, these results suggest that the predictability of announcement returns based on forecast dispersion is moderated by the extent to which firms are expected to participate in the earnings surprise game. This moderating effect further supports the validity of our argument that investor mispricing of firms' propensity to meet expectations provides an explanation for the dispersion anomaly.

4.4. Return predictability, forecast pessimism, and expectations management incentives

The combined results from the previous sections provide initial support for the prediction that investors' mispricing of earnings expectations can help explain the dispersion anomaly. In this section, we provide more direct evidence on this issue by examining the relation between announcement returns and the components of dispersion that are explained (versus unexplained) by ex-ante measures of the likelihood that firms meet current-quarter earnings expectations.

For these analyses, we rely on the insights and measures provided by two recent studies. First, Veenman and Verwijmeren [2018] find that measures constructed from previous analyst forecast errors can be used to assess the extent of pessimism in current-quarter consensus analyst expectations. They find that these measures predict whether firms meet earnings expectations, as well as the returns around earnings announcements. Second, Johnson et al. [2019] create a measure of firms' expectations management incentives, constructed as the principal component factor of separate input variables, and find that this measure also predicts announcement returns and the likelihood that firms meet expectations. Both studies conclude that, whether firms meet expectations because of biased forecasts or expectations management (or a combination of both), investors do not full unravel firms' participation in the earnings surprise game.

Following Veenman and Verwijmeren [2018], we construct an ex-ante measure of analyst forecast pessimism ($PESS_{t-1}$) that is the average of their two measures of past errors in consensus and individual analysts' forecasts of quarterly earnings.[16] For the ex-ante measure of expectations management incentives, we rely directly on the data provided by Johnson et al. [2019] (EMI_{t-1}). The only thing we change to the data is that we transform their measure to a percentile rank (created for each sample quarter) and scale this rank to values between 0 and 1 for interpretation purposes. While we are able to compute $PESS_{t-1}$ for

[16] This measure is identical to the $Pess\_combined_{t-1}$ measure used in Veenman and Verwijmeren [2018], except that we take the average of the two measures instead of the sum (hence, the difference is a factor of two).

our full sample of data, EMI_{t-1} is available only for 89 out of our 104 sample quarters given the sample selection in Johnson et al. [2019].

Because of these measures' association with announcement returns and the propensity to meet expectations, similar to what we have demonstrated for forecast dispersion, we examine whether the predictive ability of forecast dispersion for announcement returns can be explained by these ex-ante measures of differences in firms' propensity to meet expectations. In Panel A of Table 5, we first present the average values of the two measures for portfolios formed based on forecast dispersion. Consistent with the previously-discussed link between forecast dispersion and firms' participation in the earnings surprise game, we find strong associations between the ex-ante measures and forecast dispersion. For both annual and quarterly earnings forecast dispersion, we find that low-dispersion firms are associated with significantly higher levels of forecast pessimism and expectations management incentives than high-dispersion firms.[17]

In Panel B, we model forecast dispersion as a function of these ex-ante measures of firms' propensity to meet earnings expectations:

$$ln(Disp_{it}) = \beta_0 + \beta_1 Measure_{it-1} + \varepsilon_{it} \quad (1)$$

where $Disp_t$ is replaced either by $DispAnn_t$ or $DispQtr_t$ and $Measure_{t-1}$ is replaced by $PESS_{t-1}$, EMI_{t-1}, or both.

The cross-sectional regression results confirm the strong negative relations between forecast dispersion and the ex-ante measures of forecast pessimism and expectations management incentives. In other words, firms that are more likely to be involved in the earnings surprise game, as indicated by a greater extent of pessimism in analysts' past forecasts and greater incentives for expectations management, are associated with significantly lower levels of forecast dispersion. In addition, although the two measures are positively correlated

[17]Consistent with Veenman and Verwijmeren [2018] and Johnson et al. [2019], untabulated tests also reveal strong positive associations between the two ex-ante measures and firms' ex-post propensity to meet quarterly earnings expectations.

(untabulated Spearman correlation of 0.2002), the results reveal that both measures have significant incremental associations with forecast dispersion. In Panel C, we further add the (untabulated) control variables used in the previous regression analyses and find that these negative associations remain strong and significant.

Next, we use the quarterly cross-sectional regressions presented in Panel B of Table 5 to construct predicted and residual values of forecast dispersion for each firm-quarter. If investor mispricing of the probability that firms meet expectations explains the ability of dispersion to predict announcement returns, we should observe the negative relation between dispersion and returns to be concentrated in the component of dispersion explained by our ex-ante measures, and to disappear for the component of dispersion that is left unexplained by the measures.

The second-stage regression results presented in Table 6 are consistent with this prediction. For example, in Panel A we find that the portion of annual forecast dispersion that is associated with the $PESS_{t-1}$ measure explains the predictive ability of dispersion for announcement returns. Consistent with Veenman and Verwijmeren [2018], the value of dispersion predicted by $PESS_{t-1}$ is associated with significant differences in announcement returns. On the other hand, the residual value of dispersion that is left unexplained by $PESS_{t-1}$ is not significantly associated with announcement returns. Focusing on quarterly forecast dispersion, we find that the coefficient on residual dispersion is marginally significant at the 0.10 level (p-value: 0.084), but the return difference is small at only 10 basis points.

In Panel B, we use the expectations management incentive measure. Consistent with Johnson et al. [2019], we find that the part of dispersion that is explained by EMI_{t-1} is associated with significant differences in announcement returns. Although the return differences remain statistically significant at the 0.05 level when measured based on residual dispersion, the return differences of 23 and 18 basis points, respectively, are again substantially smaller than the baseline results presented earlier.

Finally, in Panel C we turn to analyses in which we use both $PESS_{t-1}$ and EMI_{t-1} to explain variation in dispersion and then use the predicted and residual values as explanatory variables for earnings announcement returns. Results from this analysis strengthen the results from Panels A and B and reveal that the portion of forecast dispersion that is left unexplained by the measures of forecast pessimism and expectations management incentives has little predictive power for announcement returns. Return differences between firms with high and low residual dispersion are reduced to a statistically and economically insignificant 5 and 6 basis points, respectively.[18]

Overall, these results suggest that the forecast dispersion anomaly can be explained by investors' inability to fully debias earnings surprises that are the result of pessimistic analyst forecasts and expectations management.

5. Additional analyses of alternative explanations

5.1. Forecast dispersion and earnings announcement premia

An alternative explanation for the differences in earnings announcement returns for firms with high and low forecast dispersion could be that firms have different exposures to earnings announcement premia. Prior studies such as Ball and Kothari [1991] and Cohen et al. [2007] find that firms earn significantly higher returns around their earnings announcement dates. Frazzini and Lamont [2007] find similar results for earnings announcement months, while Barber et al. [2013] demonstrate that this is an international phenomenon.

Barber et al. [2013] find that earnings announcement premia materialize in the days before earnings announcements. Johnson and So [2018] conclude that this result can be explained by asymmetric liquidity provision by financial intermediaries before earnings announcements, since this asymmetric liquidity provision leads to price increases that reverse after earnings announcements. Barber et al. [2013] additionally find that pre-announcement price increases relate to increases in idiosyncratic return volatility, concluding that uncer-

[18]Note that given the first-stage explanatory power (maximum average Adjusted R^2 of 0.148), this procedure leads us to isolate only a small part of the variation in dispersion that is related to firms' propensity to meet expectations. The vast majority of the variation in dispersion remains unexplained.

tainty about earnings plays an important role.[19] Because forecast dispersion similarly captures earnings uncertainty and it correlates with the factors that Johnson and So [2018] identify as increasing return reversals due to asymmetric liquidity provision, it is important to rule out the possibility that our empirical results are simply due to differences in firms' exposure to announcement premia.

To test the role of earnings announcement premia in explaining the dispersion anomaly, we examine pre-announcement return differences. If differences in exposure to earnings announcement premia explain the relation between earnings announcement returns and dispersion, we should observe an oppositely signed relation with returns in the days before the earnings announcement. In Table 7, we replace the original dependent variable from our cross-sectional regressions by the five-day buy-and-hold abnormal returns before the earnings announcement (we therefore no longer control for these days' returns in the regressions). In addition, we compare the coefficients obtained for the dispersion variables with the coefficient on the $Retvol_t$, $Evol_t$, and $Turn_t$ measures of differences of opinion to highlight the unique nature of the relation between forecast dispersion and announcement returns.

Results in Table 7 suggest there is no significant positive relation between dispersion and pre-announcement returns. Return spreads are negative and equal to 10 and 13 basis points, respectively. Hence, these results are not consistent with earnings announcement premia explaining the announcement return differences between firms with high and low dispersion. On the other hand, each of the other measures of differences of opinion has a significant positive association with pre-announcement returns. For example, while the results in Table 3 suggest that high $Turn_t$ firms significantly underperform shortly after the earnings announcement, the results in Table 7 reveal a strong average increase in prices of these firms (62 basis points) in the days leading up to the earnings announcement. Overall, the results for $Retvol_t$, $Evol_t$, and $Turn_t$ are consistent with the exposure to earnings announcement

[19]Related evidence in Patton and Verardo [2012] and Savor and Wilson [2016] suggests that earnings announcements elicit increases in firms' systematic risk exposures, which leads to increases in expected returns before earnings announcements.

premia explaining at least part of the difference in announcement returns for these variables. At the same time, the results suggest that exposure to earnings announcement premia does not explain the relation between forecast dispersion and earnings announcement returns.

5.2. *Short-sale constraints and the predictive ability of forecast dispersion*

The original explanation for the dispersion anomaly proposed by Diether et al. [2002] was based on Miller [1977], arguing that the combination of short-sale constraints and differences of opinion among investors leads to overpricing and negative returns. Using the percentage ownership of firms' shares by institutional investors as an inverse proxy for short-sale constraints (see, e.g., D'Avolio [2002]; Asquith et al. [2005]; Beneish et al. [2015]), Nagel [2005] finds some evidence that the negative relation between dispersion and future returns is concentrated among firms with more binding short-sale constraints. Berkman et al. [2009] perform a similar test using earnings announcement returns. Although they find a more negative relation between dispersion and announcement returns for low institutional ownership, this difference is not statistically significant (their Table 3). Hence, our review of the literature suggests that there is mixed evidence on the role of short-sale constraints in explaining the dispersion anomaly.

In Table 8, we re-examine the role of short-sale constraints in explaining dispersion's predictive ability for announcement returns to further differentiate our empirical results and conclusions from Diether et al. [2002]. Following prior research, we measure short-sale constraints with the fraction of shares held by institutional investors (Nagel [2005]; Berkman et al. [2009]; Hirshleifer et al. [2011]). Because of the strong relation between institutional ownership (IO) and firm size, we first follow the procedure in Nagel [2005] and orthogonalize IO with respect to firm size. Specifically, for each quarter in our sample we run the following cross-sectional regression and designate the regression residuals as residual IO (see also Hirshleifer et al. [2011]):

$$ln\left(\frac{Inst_{it}}{1-Inst_{it}}\right) = \beta_0 + \beta_1 Size_{it} + \beta_2 Size_{it}^2 + \varepsilon_{it} \quad (2)$$

where we winsorize $Inst_{it}$ at the values 0.0001 and 0.9999. Based on the quarterly median value of residual IO, firm-quarters with below-median (above-median) residuals are categorized as low (high) residual IO.[20] This procedure allows us to examine the effect of short-sale constraints as measured by IO, while keeping the effects of firm size constant.

Table 8 presents the cross-sectional regression results for subsamples split into high and low short-sale constraints, respectively. We find no evidence to suggest that the relation between dispersion and announcement returns is more negative for firms with greater short-sale constraints. If anything, the coefficients on the dispersion variables are more negative for the subsample of firms with lower short-sale constraints, although the differences in coefficients are not statistically significant at $p < 0.05$. These results are inconsistent with a role for short-sale constraints in explaining the predictive ability of forecast dispersion for earnings announcement returns.[21]

6. Summary and conclusions

Prior research documents that firms with high dispersion in analyst earnings forecasts earn lower future stock returns compared to firms with low dispersion. In this paper, we examine whether this phenomenon can be explained by investors' inability to fully unravel the earnings surprise game. Our research is motivated by the tendency of analysts' short-term forecasts to be pessimistic and firms' tendency to meet those expectations. We argue that the strategic interaction between managers and sell-side analysts leads to a predictable relation between forecast dispersion and the likelihood that firms meet current-quarter earnings expectations. Given the strong market reactions to earnings surprises (measured relative to consensus analyst expectations) and recent evidence that suggests investors are unable to

[20]We split the sample based on above- and below-median values of residual IO because the median value of residual IO is negative, despite the mean residual IO being zero by construction. This is caused by the skewness in the logged institutional ownership variable and leads to unequal sample sizes when splitting the sample based on positive versus negative values of residual IO. Nevertheless, the results and inferences are similar when using positive versus negative values of residual IO.

[21]In line with Berkman et al. [2009], the results for $Evol_t$ are consistent with Miller [1977] and the role of short-sale constraints in explaining return predictability, since $Evol_t$ is negatively associated with earnings announcement returns only for the subsample of firms with more binding short-sale constraints.

fully debias analysts' forecasts, we test investor mispricing of earnings expectations as an explanation for the dispersion anomaly.

Using a large sample of firm-quarters over the period 1993–2018, we demonstrate that the general return predictability of forecast dispersion is concentrated in earnings announcements months. Consistent with a mispricing explanation, we find that within announcement months, return predictability is concentrated around the earnings announcement date. Next, using ex-ante measures of the likelihood that firms play the earnings surprise game, we find that the return predictability of dispersion is found only among firms with a high propensity to meet analyst expectations and that it is driven by the part of dispersion that is associated with analyst pessimism and firms' expectations management incentives. In additional analyses, we find that these results are not a reflection of other factors such as differences of opinion, firms' exposure to earnings announcement premia, and short-sale constraints.

Overall, we conclude that investors' inability to fully unravel firms' propensity to play the earnings surprise game provides a viable explanation for the forecast dispersion anomaly.

Appendix: Variable definitions

$DispAnn_t$ = Dispersion in analysts' forecasts of earnings per share (EPS), measured in the month before earnings announcement month t (in Table 2: in the month before measuring RET_t) using the standard deviation of individual analysts' forecasts of annual earnings per share obtained from the unadjusted IBES Summary History files (FPI=1), scaled by the absolute value of the mean consensus forecast; for those cases where the mean consensus forecast is zero, $DispAnn_t$ is set equal to the maximum value.

$DispQtr_t$ = Dispersion in analysts' forecasts of EPS, measured in the month before earnings announcement month t (in Table 2: in the month before measuring RET_t) using the standard deviation of individual analysts' forecasts of quarterly earnings per share obtained from the unadjusted IBES Summary History files (FPI=6), scaled by the absolute value of the mean consensus forecast; for those cases where the mean consensus forecast is zero, $DispQtr_t$ is set equal to the maximum value.

$Surprise_t$ = Actual EPS for firm's quarter t obtained from the IBES Unadjusted files, less the mean consensus forecast measured using each individual analyst's latest forecast from the IBES detail files; forecasts older than 180 days are eliminated; the forecasts are adjusted for stock splits between the forecast date and earnings announcement dates using the CRSP cumulative factor to adjust prices (CFACPR).

$Meet_t$ = Indicator variable set equal to 1 if $Surprise_t$ is non-negative, 0 otherwise.

$BHAR_t^{[0,2]}$ = Buy-and-hold size-adjusted stock returns for firm's quarter t, measured from the date of the earnings announcement through two days after the earnings announcement; size-adjusted returns are computed relative to the CRSP value-weighted market capitalization index based NYSE/AMEX/NASDAQ cutoffs (CRSP file ERDPORT1); earnings announcement dates are identified using the methodology in Dellavigna and Pollet [2009] as the earlier of the Compustat and IBES earnings announcement dates; firm-quarter observations with earnings announcement dates in Compustat and IBES that disagree by more than one day are eliminated from the sample; announcements identified as occurring after market close (AMC) using the IBES timestamps are adjusted to the subsequent trading day following Johnson and So [2018].

RET_t = Raw monthly stock return from the CRSP monthly stock files.

$RETX_t^{[0,2]}$ = Raw monthly stock return from the CRSP monthly stock files for a firm's earnings announcement month, adjusted for the raw returns in the earnings announcement window [0,2].

$Size_t$ = Firm size, measured using end-of-quarter t stock price (Compustat: PRCCQ) multiplied by the total number of shares outstanding (Compustat: CSHOQ).

BtM_t = Book-to-market ratio, measured using end of quarter t book value of common equity (Compustat: CEQ) scaled by market value of equity (Compustat: PRCCQ $\times$ CSHOQ).

Lev_t = Leverage, measured using the end-of-quarter t ratio of long-term debt (Compustat: DLTT + DLC) to total assets (Compustat: ATQ).

Age_t = Firm age measured as the number of months since the firm's first appearance in the CRSP monthly stock return files through the end of fiscal-quarter t.

$Analysts_t$ = Number of analysts in the consensus forecast used to construct $Surprise_t$.

$Inst_t$ = Percentage of firm's common shares outstanding held by institutions at the end of the calendar quarter ending before the quarter of the current earnings announcement, from 13-F Filings in the Thomson Reuters' Institutional Holdings Database (S34).

$AR_t^{[-\tau]}$ = Daily size-adjusted return on day τ relative to the earnings announcement date, where $\tau \in \{-5, -4, -3, -2, -1\}$.

$BHAR_t^{[-10,-6]}$ = Buy-and-hold size-adjusted returns over days -10 through -6 relative to the earnings announcement date.

$BHAR_t^{[-5,-1]}$ = Buy-and-hold size-adjusted returns over days -5 through -1 relative to the earnings announcement date.

$Retvol_t$ = The standard deviation of daily size-adjusted returns measured over the period from 55 through 11 days before the earnings announcement.

$Evol_t$ = The standard deviation of earnings scaled by total assets (Compustat: IBQ / ATQ) in the 20 quarters before the earnings announcement, with a minimum of 4 quarters of prior earnings data required.

$Turn_t$ = Turnover, measured as the average daily ratio of trading volume (CRSP: VOL) to shares outstanding (CRSP: SHROUT) in the window from 55 through 11 days before the earnings announcement.

$PESS_{t-1}$ = Ex-ante measure of analyst forecast pessimism, measured as the average of two measures of prior consensus and individual analysts' forecast errors from Veenman and Verwijmeren [2018]; the first measure captures the fraction of the previous 12 quarters in which the firm reported earnings per share that beat ($Surprise > 0$) instead of missed ($Surprise < 0$) consensus analyst expectations; the second measure is based on individual analysts' past forecast errors, computed from the average frequency with which any firm beat (instead of missed) an individual analyst's forecasts over the preceding 12-month period and aggregated for all individual analysts that cover a particular firm-quarter; code obtained from https://sites.google.com/site/dveenman/data.

EMI_{t-1} = Ex-ante measure of expectations management incentives constructed by Johnson et al. [2019] as the principle component of four firm characteristics associated with managers' incentives to manage earnings expectations (analyst coverage, institutional ownership, five-year trailing sales growth, and Altman Z-Score); the measure is obtained from https://doi.org/10.1093/rfs/hhz141 and transformed into a quarterly percentile rank scaled between 0 and 1.

References

Abarbanell, J., and R. Lehavy. 'Biased Forecasts or Biased Earnings? The Role of Reported Earnings in Explaining Apparent Bias and Over/Underreaction in Analysts' Earnings Forecasts.' *Journal of Accounting and Economics* 36 (2003): 105–146.

Asquith, P., P. A. Pathak, and J. R. Ritter. 'Short Interest, Institutional Ownership, and Stock Returns.' *Journal of Financial Economics* 78 (2005): 243–276.

Avramov, D., T. Chordia, G. Jostova, and A. Philipov. 'Dispersion in Analysts' Earnings Forecasts and Credit Rating.' *Journal of Financial Economics* 91 (2009): 83–101.

Balakrishnan, K., E. Bartov, and L. Faurel. 'Post Loss/Profit Announcement Drift.' *Journal of Accounting and Economics* 50 (2010): 20–41.

Ball, R., and S. P. Kothari. 'Security Returns around Earnings Announcements.' *The Accounting Review* 66 (1991): 718–738.

Barber, B. M., E. T. De George, R. Lehavy, and B. Trueman. 'The Earnings Announcement Premium Around the Globe.' *Journal of Financial Economics* 108 (2013): 118–138.

Barron, O. E., O. Kim, S. C. Lim, and D. E. Stevens. 'Using Analysts' Forecasts to Measure Properties of Analysts' Information Environment.' *The Accounting Review* 73 (1998): 421–433.

Barron, O. E., M. H. Stanford, and Y. Yu. 'Further Evidence on the Relation between Analysts' Forecast Dispersion and Stock Returns.' *Contemporary Accounting Research* 26 (2009): 329–357.

Barton, J., and P. J. Simko. 'The Balance Sheet as an Earnings Management Constraint.' *The Accounting Review* 77 (2002): 1–27.

Bartov, E., D. Givoly, and C. Hayn. 'The Rewards to Meeting or Beating Earnings Expectations.' *Journal of Accounting and Economics* 33 (2002): 173–204.

Beneish, M. D., C. M. C. Lee, and D. C. Nichols. 'In Short Supply: Short-Sellers and Stock Returns.' *Journal of Accounting and Economics* 60 (2015): 33–57.

Berger, P. G., C. G. Ham, and Z. R. Kaplan. 'Do Analysts Say Anything About Earnings Without Revising Their Earnings Forecasts?' *The Accounting Review* 94 (2019): 29–52.

Berkman, H., V. Dimitrov, P. C. Jain, P. D. Koch, and S. Tice. 'Sell on the News: Differences of Opinion, Short-Sales Constraints, and Returns Around Earnings Announcements.' *Journal of Financial Economics* 92 (2009): 376–399.

Bernard, V., J. Thomas, and J. Wahlen. 'Accounting-Based Stock Price Anomalies: Separating Market Inefficiencies from Risk.' *Contemporary Accounting Research* 14 (1997): 89–136.

Bissessur, S. W., and D. Veenman. 'Analyst Information Precision and Small Earnings Surprises.' *Review of Accounting Studies* 21 (2016): 1327–1360.

Bloomfield, R. J. 'The "Incomplete Revelation Hypothesis" and Financial Reporting.' *Accounting Horizons* 16 (2002): 233–243.

Brown, L. D. 'A Temporal Analysis of Earnings Surprises: Profits versus Losses.' *Journal of Accounting Research* 39 (2001): 221–241.

Brown, L. D., A. C. Call, M. B. Clement, and N. Y. Sharp. 'Inside the "Black Box" of Sell-Side Financial Analysts.' *Journal of Accounting Research* 53 (2015): 1–47.

Brown, L. D., and M. L. Caylor. 'A Temporal Analysis of Quarterly Earnings Thresholds: Propensities and Valuation Consequences.' *The Accounting Review* 80 (2005): 423–440.

Brown, L. D., R. L. Hagerman, P. A. Griffin, and M. E. Zmijewski. 'An Evaluation of Alternative Proxies for the Market's Assessment of Unexpected Earnings.' *Journal of Accounting and Economics* 9 (1987): 159–193.

Chan, L. K. C., J. Karceski, and J. Lakonishok. 'Analysts' Conflicts of Interest and Biases in Earnings Forecasts.' *Journal of Financial and Quantitative Analysis* 42 (2007): 893–913.

Cheong, F. S., and J. Thomas. 'Management of Reported and Forecast EPS, Investor Responses, and Research Implications.' *Management Science* 64 (2018): 4277–4301.

Chordia, T., A. Subrahmanyam, and Q. Tong. 'Have Capital Market Anomalies Attenuated in the Recent Era of High Liquidity and Trading Activity?' *Journal of Accounting and Economics* 58 (2014): 41–58.

Chu, J., P. M. Dechow, K. W. Hui, and A. Y. Wang. 'Maintaining a Reputation for Consistently Beating Earnings Expectations and the Slippery Slope to Earnings Manipulation.' *Contemporary Accounting Research* 36 (2019): 1966–1998.

Clement, M., R. Frankel, and J. Miller. 'Confirming Management Earnings Forecasts, Earnings Uncertainty, and Stock Returns.' *Journal of Accounting Research* 41 (2003): 653–679.

Cohen, D. A., A. Dey, T. Z. Lys, and S. V. Sunder. 'Earnings Announcement Premia and the Limits to Arbitrage.' *Journal of Accounting and Economics* 43 (2007): 153–180.

Cotter, J., I. Tuna, and P. D. Wysocki. 'Expectations Management and Beatable Targets: How Do Analysts React to Explicit Earnings Guidance?' *Contemporary Accounting Research* 23 (2006): 593–624.

D'Avolio, G. 'The Market for Borrowing Stock.' *Journal of Financial Economics* 66 (2002): 271–306.

Dechow, P. M., S. A. Richardson, and I. Tuna. 'Why Are Earnings Kinky? An Examination of the Earnings Management Explanation.' *Review of Accounting Studies* 8 (2003): 355–384.

Degeorge, F., J. Patel, and R. Zeckhauser. 'Earnings Management to Exceed Thresholds.' *The Journal of Business* 72 (1999): 1–33.

DellaVigna, S., and J. M. Pollet. 'Investor Inattention and Friday Earnings Announcements.' *The Journal of Finance* 64 (2009): 709–749.

Diether, K. B., C. J. Malloy, and A. Scherbina. 'Differences of Opinion and the Cross Section of Stock Returns.' *The Journal of Finance* 57 (2002): 2113–2141.

Donelson, D. C., and R. J. Resutek. 'The Predictive Qualities of Earnings Volatility and Earnings Uncertainty.' *Review of Accounting Studies* 20 (2015): 470–500.

Doukas, J. A., C. F. Kim, and C. Pantzalis. 'Divergence of Opinion and Equity Returns.' *Journal of Financial and Quantitative Analysis* 41 (2006): 573–606.

Easton, P. D., and M. E. Zmijewski. 'Cross-Sectional Variation in the Stock Market Response to Accounting Earnings Announcements.' *Journal of Accounting and Economics* 11 (1989): 117–141.

Fama, E. F., and J. D. MacBeth. 'Risk, Return, and Equilibrium: Empirical Tests.' *Journal of Political Economy* 81 (1973): 607–36.

Feng, M., and S. McVay. 'Analysts' Incentives to Overweight Management Guidance When Revising Their Short-Term Earnings Forecasts.' *The Accounting Review* 85 (2010): 1617–1646.

Frazzini, A., and O. A. Lamont. 'The Earnings Announcement Premium and Trading Volume.' *Working paper, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=986940.* (2007).

Garfinkel, J. A. 'Measuring Investors' Opinion Divergence.' *Journal of Accounting Research* 47 (2009): 1317–1348.

Graham, J. R., C. R. Harvey, and S. Rajgopal. 'The Economic Implications of Corporate Financial Reporting.' *Journal of Accounting and Economics* 40 (2005): 3–73.

Green, J., J. R. M. Hand, and M. T. Soliman. 'Going, Going, Gone? The Apparent Demise of the Accruals Anomaly.' *Management Science* 57 (2011): 797–816.

Green, T. C., R. Jame, S. Markov, and M. Subasi. 'Access to Management and the Informativeness of Analyst Research.' *Journal of Financial Economics* 114 (2014): 239–255.

Grinblatt, M., G. Jostova, and A. Philipov. 'Analyst Bias and Mispricing.' *Working paper, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2653666* (2018).

Gryta, T., S. Ng, and T. Francis. 'Companies Routinely Steer Analysts to Deliver Earnings Surprises.' *Wall Street Journal* (2016).

Heflin, F., and C. Hsu. 'The Impact of the SEC's Regulation of Non-GAAP Disclosures.' *Journal of Accounting and Economics* 46 (2008): 349–365.

Hilary, G., and C. Hsu. 'Analyst Forecast Consistency.' *The Journal of Finance* 68 (2013): 271–297.

Hirshleifer, D., and S. H. Teoh. 'Limited Attention, Information Disclosure, and Financial Reporting.' *Journal of Accounting and Economics* 36 (2003): 337–386.

Hirshleifer, D., S. H. Teoh, and J. J. Yu. 'Short Arbitrage, Return Asymmetry, and the Accrual Anomaly.' *Review of Financial Studies* 24 (2011): 2429–2461.

Hwang, C.-Y., and Y. Li. 'Analysts' Reputational Concerns, Self-Censoring, and the International Dispersion Effect.' *Management Science* 64 (2017): 2289–2307.

Imhoff, E. A., and G. J. Lobo. 'The Effect of Ex Ante Earnings Uncertainty on Earnings Response Coefficients.' *The Accounting Review* 67 (1992): 427–439.

Jackson, S. B., and X. Liu. 'The Allowance for Uncollectible Accounts, Conservatism, and Earnings Management.' *Journal of Accounting Research* 48 (2010): 565–601.

Jiang, G., C. M. C. Lee, and Y. Zhang. 'Information Uncertainty and Expected Returns.' *Review of Accounting Studies* 10 (2005): 185–221.

Jiang, J. X., K. R. Petroni, and I. Yanyan Wang. 'CFOs and CEOs: Who Have the Most Influence on Earnings Management?' *Journal of Financial Economics* 96 (2010): 513–526.

Johnson, T. C. 'Forecast Dispersion and the Cross Section of Expected Returns.' *The Journal of Finance* 59 (2004): 1957–1978.

Johnson, T. L., J. Kim, and E. C. So. 'Expectations Management and Stock Returns.' *Review of Financial Studies forthcoming* (2019).

Johnson, T. L., and E. C. So. 'Asymmetric Trading Costs Prior to Earnings Announcements: Implications for Price Discovery and Returns.' *Journal of Accounting Research* 56 (2018): 217–263.

Kasznik, R., and M. F. McNichols. 'Does Meeting Earnings Expectations Matter? Evidence from Analyst Forecast Revisions and Share Prices.' *Journal of Accounting Research* 40 (2002): 727–759.

Ke, B., and Y. Yu. 'The Effect of Issuing Biased Earnings Forecasts on Analysts' Access to Management and Survival.' *Journal of Accounting Research* 44 (2006): 965–999.

Keung, E., Z.-X. Lin, and M. Shih. 'Does the Stock Market See a Zero or Small Positive Earnings Surprise as a Red Flag?' *Journal of Accounting Research* 48 (2010): 91–121.

Kinney, W., D. Burgstahler, and R. Martin. 'Earnings Surprise "Materiality" as Measured by Stock Returns.' *Journal of Accounting Research* 40 (2002): 1297–1329.

Kirk, M. P., and S. Markov. 'Come on Over: Analyst/Investor Days as a Disclosure Medium.' *The Accounting Review* 91 (2016): 1725–1750.

Kirk, M. P., D. A. Reppenhagen, and J. W. Tucker. 'Meeting Individual Analyst Expectations.' *The Accounting Review* 89 (2014): 2203–2231.

Kraft, A., A. J. Leone, and C. Wasley. 'An Analysis of the Theories and Explanations Offered for the Mispricing of Accruals and Accrual Components.' *Journal of Accounting Research* 44 (2006): 297–339.

La Porta, R., J. Lakonishok, A. Shleifer, and R. Vishny. 'Good News for Value Stocks: Further Evidence on Market Efficiency.' *The Journal of Finance* 52 (1997): 859.

Lahiri, K., and X. Sheng. 'Measuring Forecast Uncertainty by Disagreement: The Missing Link.' *Journal of Applied Econometrics* 25 (2010): 514–538.

Lawrence, A., J. P. Ryans, and E. Sun. 'Investor Demand for Sell-Side Research.' *The Accounting Review* 92 (2017): 123–149.

Levi, S., and X.-J. Zhang. 'Asymmetric Decrease in Liquidity Trading Before Earnings Announcements and the Announcement Return Premium.' *Journal of Financial Economics* 118 (2015): 383–398.

Lewellen, J. 'Accounting Anomalies and Fundamental Analysis: An Alternative View.' *Journal of Accounting and Economics* 50 (2010): 455–466.

Livnat, J., and R. R. Mendenhall. 'Comparing the Post-Earnings Announcement Drift for Surprises Calculated from Analyst and Time Series Forecasts.' *Journal of Accounting Research* 44 (2006): 177–205.

Ma, G., and S. Markov. 'The Market's Assessment of the Probability of Meeting or Beating the Consensus.' *Contemporary Accounting Research* 34 (2017): 314–342.

Malmendier, U., and D. Shanthikumar. 'Do Security Analysts Speak in Two Tongues?' *Review of Financial Studies* 27 (2014): 1287–1322.

Matsumoto, D. A. 'Management's Incentives to Avoid Negative Earnings Surprises.' *The Accounting Review* 77 (2002): 483–514.

Mayew, W. J. 'Evidence of Management Discrimination Among Analysts during Earnings Conference Calls.' *Journal of Accounting Research* 46 (2008): 627–659.

McLean, R. D., and J. Pontiff. 'Does Academic Research Destroy Stock Return Predictability?' *The Journal of Finance* 71 (2016): 5–32.

McNichols, M., and P. C. O'Brien. 'Self-Selection and Analyst Coverage.' *Journal of Accounting Research* 35 (1997): 167–199.

Mikhail, M. B., B. R. Walther, and R. H. Willis. 'Do Security Analysts Improve Their Performance with Experience?' *Journal of Accounting Research* 35 (1997): 131.

Miller, E. M. 'Risk, Uncertainty, and Divergence of Opinion.' *The Journal of Finance* 32 (1977): 1151–1168.

Nagel, S. 'Short Sales, Institutional Investors and the Cross-Section of Stock Returns.' *Journal of Financial Economics* 78 (2005): 277–309.

Newey, W. K., and K. D. West. 'A Simple, Positive Semi-Definite, Heteroskedasticity and Autocorrelation Consistent Covariance Matrix.' *Econometrica* 55 (1987): 703–708.

Patton, A. J., and M. Verardo. 'Does Beta Move with News? Firm-Specific Information Flows and Learning about Profitability.' *Review of Financial Studies* 25 (2012): 2789–2839.

Richardson, S., I. Tuna, and P. Wysocki. 'Accounting Anomalies and Fundamental Analysis: A Review of Recent Research Advances.' *Journal of Accounting and Economics* 50 (2010): 410–454.

Richardson, S. A., S. H. Teoh, and P. D. Wysocki. 'The Walk-down to Beatable Analyst Forecasts: The Role of Equity Issuance and Insider Trading Incentives.' *Contemporary Accounting Research* 21 (2004): 885–924.

Sadka, R., and A. Scherbina. 'Analyst Disagreement, Mispricing, and Liquidity.' *The Journal of Finance* 62 (2007): 2367–2403.

Savor, P., and M. Wilson. 'Earnings Announcements and Systematic Risk.' *The Journal of Finance* 71 (2016): 83–138.

Skinner, D., and R. Sloan. 'Earnings Surprises, Growth Expectations, and Stock Returns or Don't Let an Earnings Torpedo Sink Your Portfolio.' *Review of Accounting Studies* 7 (2002): 289–312.

So, E. C. 'A New Approach to Predicting Analyst Forecast Errors: Do Investors Overweight Analyst Forecasts?' *Journal of Financial Economics* 108 (2013): 615–640.

So, E. C., and S. Wang. 'News-Driven Return Reversals: Liquidity Provision Ahead of Earnings Announcements.' *Journal of Financial Economics* 114 (2014): 20–35.

Stickel, S. E. 'Reputation and Performance Among Security Analysts.' *The Journal of Finance* 47 (1992): 1811.

Veenman, D., and P. Verwijmeren. 'Do Investors Fully Unravel Persistent Pessimism in Analysts' Earnings Forecasts?' *The Accounting Review* 93 (2018): 349–377.

Zhang, X. F. 'Information Uncertainty and Stock Returns.' *The Journal of Finance* 61 (2006): 105–137.

Zweig, J. 'Earnings Surprises: The Stock Market's Worst-Kept Secret.' *Wall Street Journal* (2018).

Figure 1

Time-series variation in earnings announcement return differences and the fraction of firms meeting earnings expectations

For each of the 104 calendar quarters in the sample from 1993Q1 through 2018Q4, the bar graph (primary y-axis) plots the difference in average earnings announcement returns ($BHAR_t^{[0,2]}$) between firms in the lowest quarterly quintile (Q1) and firms in the highest quarterly quintile (Q5) of analyst forecast dispersion. Analyst forecast dispersion is measured as the coefficient of variation in analysts' forecasts of annual earnings ($DispAnn_t$) in the month before a quarterly earnings announcement. Quintile portfolios of forecast dispersion are created each quarter. The average return difference is positive in 79 of the 104 quarters (76.0 percent). Earnings announcement returns are trimmed at the top and bottom 0.1 percent of the distribution. The line graph (secondary y-axis) plots the fraction of firms that meet or beat consensus earnings expectations ($Surprise_t \geq 0$) for each calendar quarter. $BHAR_t^{[0,2]}$, $DispAnn_t$, and $Surprise_t$ are defined in more detail in the Appendix.

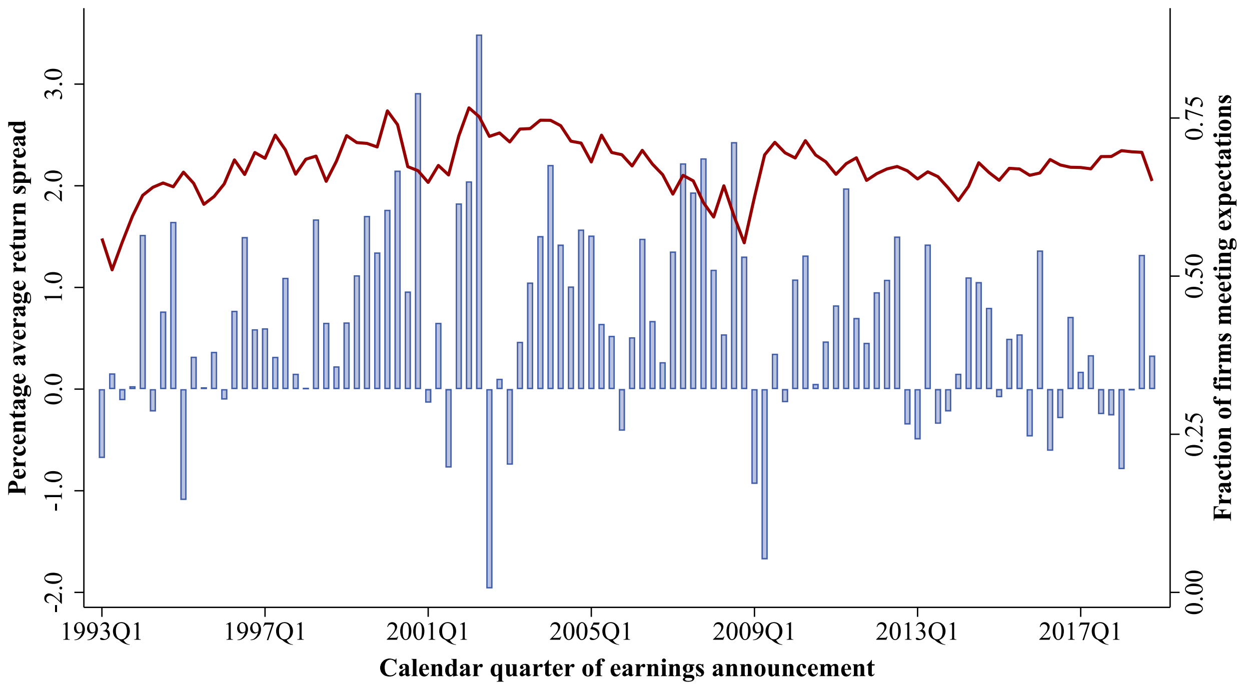

Figure 2

Frequency distribution of earnings surprises for low and high dispersion firms

Frequency distributions (kernel density plots) of quarterly earnings surprises ($Surprise_t$) for firms in the lowest quintile (Q1, solid red line) and firms in the highest quintile (Q5, dashed blue line) of analyst forecast dispersion. Analyst forecast dispersion is measured as the coefficient of variation in analysts' forecasts of annual earnings ($DispAnn_t$) in the month before a quarterly earnings announcement. Quintile portfolios of forecast dispersion are created each quarter and kernel density plots are based on the Guassian kernel function and a bandwidth of one. See the Appendix for details on the definitions of variables $DispAnn_t$ and $Surprise_t$ and Table 1 for sample selection details.

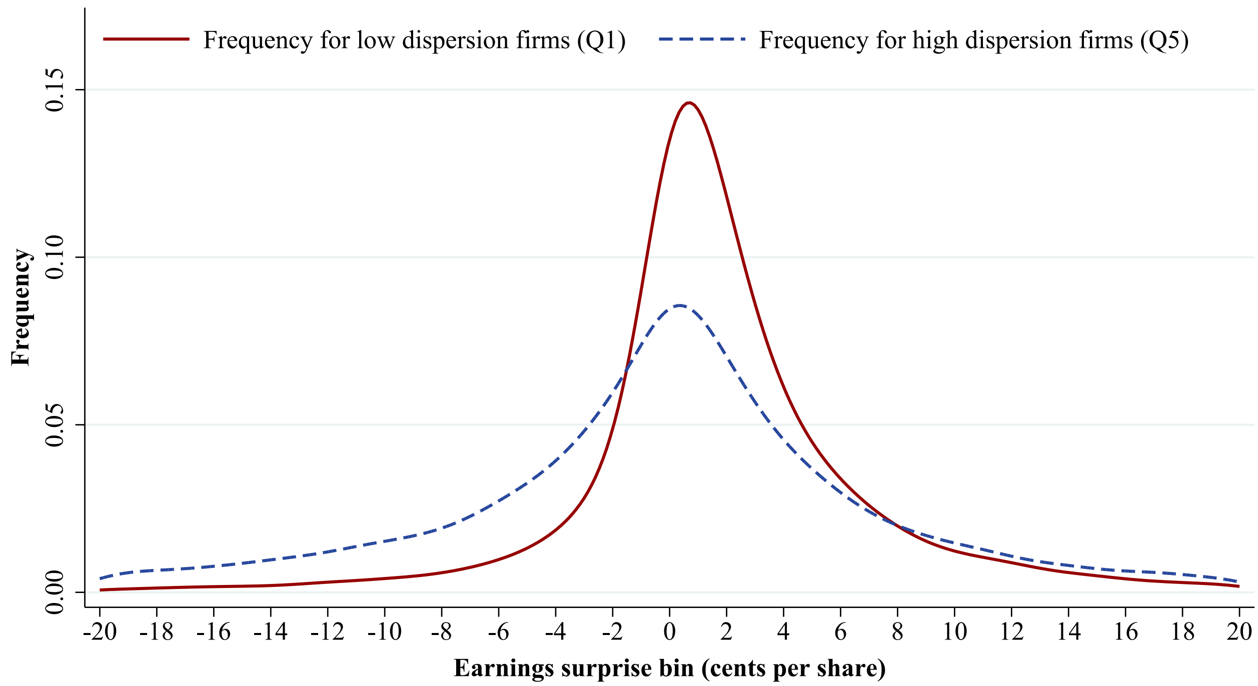

Table 1
Sample selection and descriptive statistics

Panel A: Sample selection details

	Firm-quarters
Unique firm-quarters in CRSP/Compustat for fiscal periods ending in calendar quarters 1993Q1 through 2018Q4 with positive total assets and non-missing net income (IBQ), stock price (PRCCQ), and shares outstanding (CSHOQ)	604,487
– Firm not listed on NYSE, AMEX, or NASDAQ	-4,617
– Stock price below $1 at fiscal quarter end	-24,857
– Missing earnings announcement date in Compustat	-43,761
– Missing earnings surprise data in IBES	-163,036
– Earnings announcement dates differ by > 1 days	-13,696
– Earnings announcement delay > 180 days	-280
– Earnings announcement return data not available in CRSP	-7,532
– Dispersion measures not available in IBES	-56,064
– Data on control variables missing	-3,057
Final sample of firm-quarters	287,587
Firm-quarters with forecast pessimism measure ($PESS_{t-1}$) available	263,665
Firm-quarters with expectations management measure (EMI_{t-1}) available	147,404

Panel B: Sample distribution and frequency of firms meeting analysts' expectations over time

Year	n	$Meet_t$	Year	n	$Meet_t$
1993	6,851	0.557	2006	12,206	0.678
1994	8,151	0.640	2007	12,251	0.639
1995	8,965	0.637	2008	11,809	0.597
1996	9,963	0.673	2009	11,068	0.681
1997	11,164	0.692	2010	11,445	0.693
1998	11,890	0.676	2011	11,313	0.669
1999	11,861	0.712	2012	11,270	0.668
2000	11,077	0.712	2013	11,546	0.654
2001	10,513	0.677	2014	12,225	0.651
2002	10,221	0.742	2015	12,441	0.663
2003	10,391	0.731	2016	12,151	0.674
2004	11,138	0.727	2017	11,892	0.680
2005	11,927	0.698	2018	11,858	0.686

Panel C: Overall frequency of earnings surprises and average announcement returns by surprise bin

	≤-4¢	-3¢	-2¢	-1¢	0¢	1¢	2¢	3¢	≥4¢
Frequency	0.197	0.035	0.048	0.072	0.132	0.125	0.094	0.070	0.312
$BHAR_t^{[0,1]}$	-0.034	-0.024	-0.021	-0.017	-0.010	0.001	0.010	0.015	0.028

Notes: Panel A presents the sample selection procedures used to construct the sample of firm-quarters in the intersection of CRSP, Compustat, and IBES. Panel B presents insights on the sample frequency over time and the frequency with which firms meet quarterly earnings expectations ($Meet_t$) in each sample year. Panel C presents the frequency of observations in different bins of $Surprise_t$ and the average market reaction to earnings announcements ($BHAR_t^{[0,2]}$) for each bin. Variables $PESS_{t-1}$, EMI_{t-1}, $Meet_t$, $Surprise_t$, and $BHAR_t^{[0,2]}$ are defined in the Appendix.

Table 2

Analyst forecast dispersion, stock returns, and earnings announcements

Panel A: Average returns by monthly dispersion quintile based on annual earnings forecasts

Quintile	RET_t	EA RET_t	Non-EA RET_t	$BHAR_t^{[0,2]}$	$RETX_t^{[0,2]}$	$Meet_t$
1	1.13	1.60	0.91	0.26	1.25	0.770
2	1.06	1.43	0.86	0.11	1.27	0.732
3	0.98	1.20	0.79	-0.10	1.27	0.681
4	0.91	1.14	0.79	-0.28	1.33	0.610
5	0.61	0.81	0.51	-0.41	1.15	0.527
Q1–Q5	0.52	0.79	0.40	0.67	0.09	0.246
t-stat.	[1.95]*	[2.76]***	[1.52]	[5.64]***	[0.38]	[40.31]***

Panel B: Average returns by monthly dispersion quintile based on quarterly earnings forecasts

Quintile	RET_t	EA RET_t	Non-EA RET_t	$BHAR_t^{[0,2]}$	$RETX_t^{[0,2]}$	$Meet_t$
1	1.11	1.45	0.94	0.15	1.24	0.780
2	1.06	1.58	0.80	0.18	1.34	0.736
3	0.96	1.34	0.76	-0.05	1.31	0.684
4	0.88	1.09	0.77	-0.20	1.27	0.614
5	0.68	0.77	0.61	-0.50	1.17	0.518
Q1–Q5	0.43	0.68	0.33	0.65	0.07	0.262
t-stat.	[2.21]**	[3.32]***	[1.66]*	[6.20]***	[0.40]	[46.56]***

Notes: Time-series averages of returns and frequencies of firms meeting earnings expectations for quintile portfolios formed based on forecast dispersion. For the sample of firm-quarters identified in Table 1, we create a firm-month sample that we merge with return data from the CRSP monthly stock files. Because the firm-quarters identified in Table 1 end in calendar quarters 1993Q1 through 2018Q4, these analyses are restricted to the 312 months from April 1993 through March 2019. For each firm-month, forecast dispersion is measured from the IBES Summary History files using forecasts of annual earnings ($DispAnn_t$, Panel A) and forecasts of quarterly earnings ($DispQtr_t$, Panel B) in the previous month. Quintile portfolios are constructed for each of the 312 months in the sample using the previous-month ranks of the dispersion variable. EA refers to firm-months with earnings announcements, non-EA refers to all other firm-months. See the Appendix for details on the variable definitions. All return variables are trimmed at the top and bottom 0.1 percent of the distribution. Average returns values are multiplied by 100 for presentation purposes. t-statistics are based on time series averages and standard errors adjusted for autocorrelation using Newey and West [1987] and five lags. *, **, and *** represent statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

Table 3

Cross-sectional earnings announcement return regressions

	$BHAR_t^{[0,2]}$	$BHAR_t^{[0,2]}$	$BHAR_t^{[0,2]}$	$BHAR_t^{[0,2]}$	$BHAR_t^{[0,2]}$	$BHAR_t^{[0,2]}$
Test variables:						
$DispAnn_t$	-0.746	-0.650	-0.325			
	(-5.42)***	(-5.59)***	(-3.68)***			
$DispQtr_t$				-0.602	-0.570	-0.300
				(-5.88)***	(-6.30)***	(-4.28)***
Control variables:						
$Size_t$		0.380	-0.011		0.415	-0.016
		(2.83)***	(-0.07)		(2.86)***	(-0.11)
BtM_t		0.586	0.280		0.588	0.270
		(5.94)***	(3.66)***		(5.93)***	(3.55)***
Lev_t		-0.118	-0.235		-0.106	-0.236
		(-1.53)	(-2.65)***		(-1.40)	(-2.70)***
Age_t		0.137	-0.064		0.153	-0.065
		(1.03)	(-0.70)		(1.13)	(-0.72)
$Analysts_t$		-0.042	0.200		-0.062	0.199
		(-0.39)	(1.96)*		(-0.56)	(1.92)*
$Inst_t$		0.537	0.650		0.557	0.665
		(4.39)***	(4.88)***		(4.52)***	(5.02)***
$AR_t^{[-1]}$		-1.424	-1.439		-1.420	-1.437
		(-11.74)***	(-11.86)***		(-11.68)***	(-11.83)***
$AR_t^{[-2]}$		-0.811	-0.830		-0.806	-0.828
		(-6.41)***	(-6.54)***		(-6.37)***	(-6.52)***
$AR_t^{[-3]}$		-0.517	-0.535		-0.509	-0.531
		(-4.49)***	(-4.57)***		(-4.41)***	(-4.52)***
$AR_t^{[-4]}$		-0.414	-0.437		-0.411	-0.437
		(-3.55)***	(-3.72)***		(-3.51)***	(-3.71)***
$AR_t^{[-5]}$		-0.290	-0.308		-0.283	-0.304
		(-2.84)***	(-3.00)***		(-2.79)***	(-2.97)***
$BHAR_t^{[-10,-6]}$		-0.337	-0.362		-0.333	-0.361
		(-3.14)***	(-3.39)***		(-3.15)***	(-3.42)***
$Retvol_t$			-0.451			-0.460
			(-3.73)***			(-3.63)***
$Evol_t$			-0.436			-0.458
			(-3.43)***			(-3.50)***
$Turn_t$			-0.383			-0.397
			(-3.94)***			(-4.10)***
n	287,587	287,587	287,587	287,587	287,587	287,587
n (quarters)	104	104	104	104	104	104
Average adj. R^2	0.002	0.012	0.014	0.001	0.011	0.014

Notes: Average coefficient estimates obtained from quarterly cross-sectional regressions (Fama and MacBeth [1973]) of earnings announcement returns on forecast dispersion and control variables. Average coefficients are multiplied by 100 for presentation purposes. Earnings announcement returns are trimmed at the top and bottom 0.1 percent of the distribution. All independent variables are transformed into quarterly decile portfolios, scaled between -0.5 and 0.5. See the Appendix for details on the variable definitions. t-statistics are based on time series averages and standard errors adjusted for autocorrelation using Newey and West [1987] and five lags. *, **, and *** represent statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

Table 4

Tests split by past frequency of meeting or beating earnings expectations (MBE)

	Low MBE freq. $BHAR_t^{[0,2]}$	High MBE freq. $BHAR_t^{[0,2]}$	Low MBE freq. $BHAR_t^{[0,2]}$	High MBE freq. $BHAR_t^{[0,2]}$
Test variables:				
$DispAnn_t$	-0.146	-0.422		
	(-1.44)	(-3.67)***		
$DispQtr_t$			-0.062	-0.457
			(-0.87)	(-4.86)***
Control variables:				
$Size_t$	0.133	-0.182	0.140	-0.197
	(0.78)	(-1.01)	(0.80)	(-1.07)
BtM_t	0.363	0.167	0.344	0.166
	(3.50)***	(1.87)*	(3.29)***	(1.97)*
Lev_t	-0.271	-0.175	-0.279	-0.164
	(-2.66)***	(-1.67)*	(-2.77)***	(-1.54)
Age_t	0.047	-0.088	0.046	-0.080
	(0.44)	(-0.78)	(0.44)	(-0.70)
$Analysts_t$	0.239	0.130	0.233	0.128
	(1.89)*	(0.97)	(1.82)*	(0.94)
$Inst_t$	0.835	0.430	0.843	0.445
	(4.94)***	(3.16)***	(4.98)***	(3.32)***
$AR_t^{[-1]}$	-1.378	-1.491	-1.376	-1.491
	(-11.68)***	(-9.82)***	(-11.57)***	(-9.82)***
$AR_t^{[-2]}$	-0.780	-0.912	-0.778	-0.909
	(-5.66)***	(-7.02)***	(-5.63)***	(-7.03)***
$AR_t^{[-3]}$	-0.468	-0.604	-0.464	-0.601
	(-4.45)***	(-4.35)***	(-4.37)***	(-4.35)***
$AR_t^{[-4]}$	-0.371	-0.454	-0.373	-0.451
	(-3.09)***	(-3.14)***	(-3.09)***	(-3.14)***
$AR_t^{[-5]}$	-0.352	-0.359	-0.350	-0.356
	(-3.14)***	(-2.49)**	(-3.11)***	(-2.46)**
$BHAR_t^{[-10,-6]}$	-0.264	-0.502	-0.267	-0.499
	(-2.41)**	(-4.49)***	(-2.45)**	(-4.54)***
$Retvol_t$	-0.397	-0.483	-0.409	-0.487
	(-3.66)***	(-2.81)***	(-3.69)***	(-2.80)***
$Evol_t$	-0.402	-0.388	-0.428	-0.387
	(-3.09)***	(-2.66)***	(-3.16)***	(-2.58)**
$Turn_t$	-0.653	-0.152	-0.666	-0.171
	(-4.60)***	(-1.17)	(-4.65)***	(-1.30)
n	140,725	144,858	140,725	144,858
n (quarters)	104	104	104	104
Average adj. R^2	0.015	0.015	0.014	0.014

Notes: Average coefficient estimates obtained from quarterly cross-sectional regressions (Fama and MacBeth [1973]) of earnings announcement returns on forecast dispersion and control variables, estimated separately for firm-quarters with high versus low frequencies of meeting or beating consensus expectations (MBE) in the previous 12 quarters. Firms are designated as having a high (low) MBE frequency when the fraction of quarters meeting or beating consensus expectations exceeds (is smaller than or equal to) 2/3. Average coefficients are multiplied by 100 for presentation purposes. Earnings announcement returns are trimmed at the top and bottom 0.1 percent of the distribution. All independent variables are transformed into quarterly decile portfolios, scaled between -0.5 and 0.5. See the Appendix for details on the variable definitions. t-statistics are based on time series averages and standard errors adjusted for autocorrelation using Newey and West [1987] and five lags. *, **, and *** represent statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

Table 5

Association between forecast dispersion and ex-ante measures of forecast pessimism and expectations management

Panel A: Association of dispersion with measures of forecast pessimism and expectations management

$DispAnn_t$ Quintile	$PESS_{t-1}$	EMI_{t-1}	$DispQtr_t$ Quintile	$PESS_{t-1}$	EMI_{t-1}
1	0.705	0.573	1	0.701	0.564
2	0.678	0.554	2	0.677	0.568
3	0.643	0.518	3	0.643	0.508
4	0.603	0.465	4	0.601	0.455
5	0.556	0.387	5	0.561	0.399
Q5–Q1	-0.149	-0.187	Q5–Q1	-0.140	-0.165
t-stat.	[-18.62]***	[-22.55]***	t-stat.	[-16.29]***	[-15.30]***

Panel B: Regressions explaining dispersion without controls

	$DispAnn_t$	$DispAnn_t$	$DispAnn_t$	$DispQtr_t$	$DispQtr_t$	$DispQtr_t$
$PESS_{t-1}$	-3.157		-3.120	-3.131		-3.211
	(-24.21)***		(-21.19)***	(-25.12)***		(-18.31)***
EMI_{t-1}		-1.040	-0.723		-0.956	-0.634
		(-23.38)***	(-29.68)***		(-21.98)***	(-40.66)***
n	263,665	147,404	142,813	263,665	147,404	142,813
n (quarters)	104	89	89	104	89	89
Avg. adj. R^2	0.119	0.049	0.148	0.088	0.030	0.108

Panel C: Regressions explaining dispersion with controls

	$DispAnn_t$	$DispAnn_t$	$DispAnn_t$	$DispQtr_t$	$DispQtr_t$	$DispQtr_t$
$PESS_{t-1}$	-2.421		-2.489	-2.433		-2.577
	(-22.86)***		(-25.76)***	(-21.74)***		(-16.95)***
EMI_{t-1}		-0.522	-0.420		-0.437	-0.330
		(-27.64)***	(-20.77)***		(-17.92)***	(-15.98)***
Control vars.	Yes	Yes	Yes	Yes	Yes	Yes
n	263,665	147,404	142,813	263,665	147,404	142,813
n (quarters)	104	89	89	104	89	89
Avg. adj. R^2	0.296	0.258	0.316	0.188	0.144	0.189

Notes: Panel A presents time-series averages of the 104 quarterly means of variables $PESS_{t-1}$ and EMI_{t-1} for quintile portfolios formed based on forecast dispersion. Forecast dispersion is measured using forecasts of either annual ($DispAnn_t$) or quarterly ($DispQtr_t$) earnings. Panel B presents average coefficient estimates obtained from quarterly cross-sectional regressions (Fama and MacBeth [1973]) of the natural logarithm of forecast dispersion on $PESS_{t-1}$ and EMI_{t-1}, where the forecast dispersion variables are winsorized at the 1st and 99th percentiles of their distributions. Panel C presents the same analysis with the (untabulated) control variables included in Table 3. See the Appendix for details on the variable definitions. t-statistics are based on time series averages and standard errors adjusted for autocorrelation using Newey and West [1987] and five lags. *, **, and *** represent statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

Table 6

Return predictability after explaining forecast dispersion with ex-ante measures of forecast pessimism and expectations management

Panel A: Dispersion (un)explained by pessimism measure ($PESS$)

	$DispAnn_t$		$DispQtr_t$	
	$BHAR_t^{[0,2]}$	$BHAR_t^{[0,2]}$	$BHAR_t^{[0,2]}$	$BHAR_t^{[0,2]}$
Test variables:				
$Fitted\ dispersion_t$	-0.403		-0.409	
	(-5.62)***		(-5.75)***	
$Residual\ dispersion_t$		-0.091		-0.104
		(-1.18)		(-1.78)*
Control variables	Yes	Yes	Yes	Yes
n	263,665	263,665	263,665	263,665
n (quarters)	104	104	104	104
Average adj. R^2	0.013	0.013	0.013	0.013

Panel B: Dispersion (un)explained by expectations management measure (EMI)

	$DispAnn_t$		$DispQtr_t$	
	$BHAR_t^{[0,2]}$	$BHAR_t^{[0,2]}$	$BHAR_t^{[0,2]}$	$BHAR_t^{[0,2]}$
Test variables:				
$Fitted\ dispersion_t$	-0.625		-0.625	
	(-5.16)***		(-5.16)***	
$Residual\ dispersion_t$		-0.233		-0.183
		(-2.06)**		(-2.00)**
Control variables	Yes	Yes	Yes	Yes
n	147,404	147,404	147,404	147,404
n (quarters)	89	89	89	89
Average adj. R^2	0.015	0.014	0.015	0.014

Panel C: Dispersion (un)explained by pessimism ($PESS$) and expectations management (EMI) measures

	$DispAnn_t$		$DispQtr_t$	
	$BHAR_t^{[0,2]}$	$BHAR_t^{[0,2]}$	$BHAR_t^{[0,2]}$	$BHAR_t^{[0,2]}$
Test variables:				
$Fitted\ dispersion_t$	-0.606		-0.569	
	(-6.09)***		(-6.44)***	
$Residual\ dispersion_t$		-0.050		-0.064
		(-0.48)		(-0.81)
Control variables	Yes	Yes	Yes	Yes
n	142,813	142,813	142,813	142,813
n (quarters)	89	89	89	89
Average adj. R^2	0.015	0.014	0.014	0.014

Notes: Average coefficient estimates obtained from quarterly cross-sectional regressions (Fama and MacBeth [1973]) of earnings announcement returns on fitted and residual forecast dispersion and control variables, where fitted and residual forecast dispersion are obtained from the first-stage quarterly estimations in Panel B of Table 5. In Panel A, fitted and residual values of dispersion are obtained from quarterly regressions of forecast dispersion on the ex-ante forecast pessimism measure ($PESS_{t-1}$). In Panel B, fitted and residual values of dispersion are obtained from quarterly regressions of forecast dispersion on the expectations management measure (EMI_{t-1}). In Panel C, fitted and residual values of dispersion are obtained from quarterly regressions of forecast dispersion on the ex-ante forecast pessimism measure ($PESS_{t-1}$) and the expectations management measure (EMI_{t-1}). Average coefficients are multiplied by 100 for presentation purposes. Earnings announcement returns are trimmed at the top and bottom 0.1 percent of the distribution, and all independent variables (including untabulated control variables) are transformed into quarterly decile portfolios, scaled between -0.5 and 0.5. See the Appendix for details on the variable definitions. t-statistics are based on time series averages and standard errors adjusted for autocorrelation using Newey and West [1987] and five lags. *, **, and *** represent statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

Table 7

Alternative explanation: differences of opinion and earnings announcement premia

	$BHAR_t^{[-5,-1]}$	$BHAR_t^{[-5,-1]}$	$BHAR_t^{[-5,-1]}$	$BHAR_t^{[-5,-1]}$	$BHAR_t^{[-5,-1]}$
Test variables:					
$DispAnn_t$	-0.095				
	(-1.07)				
$DispQtr_t$		-0.126			
		(-1.95)*			
$Retvol_t$			0.480		
			(2.74)***		
$Evol_t$				0.333	
				(2.60)**	
$Turn_t$					0.624
					(3.83)***
Control variables:					
$Size_t$	-0.427	-0.435	-0.109	-0.246	-0.278
	(-2.38)**	(-2.35)**	(-0.83)	(-1.59)	(-1.57)
BtM_t	-0.216	-0.209	-0.167	-0.125	-0.128
	(-2.19)**	(-2.07)**	(-1.97)*	(-1.31)	(-1.59)
Lev_t	-0.247	-0.245	-0.228	-0.229	-0.207
	(-1.79)*	(-1.75)*	(-1.81)*	(-1.69)*	(-1.73)*
Age_t	-0.179	-0.175	-0.051	-0.105	-0.083
	(-2.43)**	(-2.33)**	(-0.94)	(-1.58)	(-1.46)
$Analysts_t$	0.269	0.277	0.151	0.209	0.061
	(1.92)*	(1.91)*	(1.30)	(1.61)	(0.59)
$Inst_t$	-0.277	-0.280	-0.271	-0.291	-0.453
	(-4.97)***	(-4.87)***	(-4.60)***	(-4.69)***	(-5.03)***
$BHAR_t^{[-10,-6]}$	-1.122	-1.117	-1.142	-1.136	-1.143
	(-7.11)***	(-7.09)***	(-7.08)***	(-7.09)***	(-7.03)***
n	287,012	287,012	287,012	287,012	287,012
n (quarters)	104	104	104	104	104
Average adj. R^2	0.015	0.015	0.017	0.016	0.017

Notes: Average coefficient estimates obtained from quarterly cross-sectional regressions (Fama and MacBeth [1973]) of pre-earnings announcement returns on forecast dispersion and control variables. Average coefficients are multiplied by 100 for presentation purposes. Pre-earnings announcement returns are trimmed at the top and bottom 0.1 percent of the distribution. All independent variables are transformed into quarterly decile portfolios, scaled between -0.5 and 0.5. See the Appendix for details on the variable definitions. t-statistics are based on time series averages and standard errors adjusted for autocorrelation using Newey and West [1987] and five lags. *, **, and *** represent statistical significance at the 0.10, 0.05, and 0.01 level, respectively.

Table 8

Alternative explanation: testing the role of short-sale constraints (SSC)

	High SSC $BHAR_t^{[0,2]}$	Low SSC $BHAR_t^{[0,2]}$	Diff.	High SSC $BHAR_t^{[0,2]}$	Low SSC $BHAR_t^{[0,2]}$	Diff.
Test variables:						
$DispAnn_t$	-0.301	-0.371	0.071			
	(-2.75)***	(-3.44)***	(0.54)			
$DispQtr_t$				-0.212	-0.407	0.195
				(-2.15)**	(-4.29)***	(1.75)*
Control variables:						
$Size_t$	0.167	-0.251	0.418	0.168	-0.276	0.444
	(0.91)	(-1.30)	(2.09)**	(0.91)	(-1.39)	(2.19)**
BtM_t	0.101	0.422	-0.321	0.080	0.419	-0.338
	(1.03)	(4.06)***	(-2.36)**	(0.83)	(4.15)***	(-2.48)**
Lev_t	-0.261	-0.214	-0.046	-0.272	-0.206	-0.066
	(-3.06)***	(-1.89)*	(-0.39)	(-3.19)***	(-1.90)*	(-0.57)
Age_t	-0.262	0.089	-0.351	-0.258	0.082	-0.339
	(-2.05)**	(1.07)	(-2.79)***	(-2.05)**	(0.99)	(-2.71)***
$Analysts_t$	0.266	0.155	0.110	0.267	0.161	0.107
	(1.91)*	(1.10)	(0.70)	(1.92)*	(1.13)	(0.68)
$Inst_t$	0.854	0.766	0.089	0.871	0.790	0.081
	(4.48)***	(4.70)***	(0.45)	(4.61)***	(4.89)***	(0.41)
$AR_t^{[-1]}$	-1.554	-1.333	-0.221	-1.552	-1.333	-0.219
	(-10.40)***	(-11.44)***	(-1.75)*	(-10.34)***	(-11.44)***	(-1.72)*
$AR_t^{[-2]}$	-0.928	-0.752	-0.176	-0.923	-0.751	-0.172
	(-8.05)***	(-4.77)***	(-1.68)*	(-7.99)***	(-4.76)***	(-1.64)
$AR_t^{[-3]}$	-0.572	-0.493	-0.079	-0.565	-0.491	-0.074
	(-4.30)***	(-3.88)***	(-0.70)	(-4.25)***	(-3.87)***	(-0.65)
$AR_t^{[-4]}$	-0.422	-0.475	0.053	-0.422	-0.474	0.052
	(-3.33)***	(-3.81)***	(0.49)	(-3.34)***	(-3.79)***	(0.48)
$AR_t^{[-5]}$	-0.278	-0.355	0.077	-0.269	-0.356	0.087
	(-2.77)***	(-2.80)***	(0.64)	(-2.69)***	(-2.81)***	(0.71)
$BHAR_t^{[-10,-6]}$	-0.328	-0.407	0.079	-0.328	-0.407	0.079
	(-2.81)***	(-3.17)***	(0.63)	(-2.84)***	(-3.18)***	(0.63)
$Retvol_t$	-0.589	-0.294	-0.294	-0.618	-0.293	-0.326
	(-3.63)***	(-2.16)**	(-1.80)*	(-3.75)***	(-2.17)**	(-2.06)**
$Evol_t$	-0.620	-0.191	-0.429	-0.659	-0.200	-0.459
	(-5.23)***	(-1.43)	(-3.46)***	(-5.44)***	(-1.49)	(-3.72)***
$Turn_t$	-0.439	-0.311	-0.128	-0.457	-0.323	-0.134
	(-3.98)***	(-2.52)**	(-0.95)	(-4.11)***	(-2.62)**	(-0.99)
n	143,769	143,818		143,769	143,818	
n (quarters)	104	104		104	104	
Average adj. R^2	0.019	0.012		0.019	0.011	

Notes: Average coefficient estimates obtained from quarterly cross-sectional regressions (Fama and MacBeth [1973]) of earnings announcement returns on forecast dispersion and control variables, estimated separately for firm-quarters identified as having high and low short-sale constraints (SSC), respectively. Average coefficients are multiplied by 100 for presentation purposes. To identify high and low SSC, for each quarter in our sample we run the following cross-sectional regression and designate the regression residuals as residual institutional ownership (IO):

$$ln\left(\frac{Inst_{it}}{1 - Inst_{it}}\right) = \beta_0 + \beta_1 Size_{it} + \beta_2 Size_{it}^2 + \varepsilon_{it}$$

where we winsorize $Inst_{it}$ at the values 0.0001 and 0.9999 following Nagel [2005]. Based on the quarterly median value of residual IO, firm-quarters with below-median (above-median) residual IO are categorized as being associated with high (low) SSC. Earnings announcement returns are trimmed at the top and bottom 0.1 percent of the distribution. All independent variables are transformed into quarterly decile portfolios, scaled between -0.5 and 0.5. See the Appendix for details on the variable definitions. t-statistics are based on time series averages and standard errors adjusted for autocorrelation using Newey and West [1987] and five lags. *, **, and *** represent statistical significance at the 0.10, 0.05, and 0.01 level, respectively.