Risk Factor Disclosures: Do Managers and Markets Speak the Same Language?

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SYNOPSIS: Prior research documents a market response to quarterly updates to annual risk factor disclosures at the time of release, suggesting quarterly risk factor updates provide informational value to investors. In this study, we explore whether future *equity returns* are associated with quarterly risk factor updates, and whether updates containing more focused and specific language affect this relationship. We find that firms with quarterly risk factor updates experience lower future abnormal returns, relative to firms without updates, suggesting that on average, the market reaction to quarterly risk factor updates is incomplete at the time the 10-Q is filed. Further, we find that our language-based measures are able to parse out important updates (i.e., updates that are predictive of lower future unexpected *earnings*) versus unimportant updates. We find that the incomplete market reaction is driven primarily by the group of updates that is important, yet provides less information about the effects of the risk on firm fundamentals. We also examine how sophisticated users of financial reports, i.e., analysts, respond to risk factor updates. Overall, we find consistent results, that analyst underreaction is concentrated in the same group of risk factor updates driving market underreaction.

Keywords risk factor disclosure, regulation, market efficiency, abnormal stock returns

JEL Classification D8, G14, M41, M48

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INTRODUCTION

In 2005, the Securities and Exchange Commission (SEC) began requiring the disclosure of risk factors in annual reports and updates in quarterly reports. These disclosures require firms to discuss downside risks facing the firm (Robbins and Rothenberg 2006). Since the requirement went into effect, investors have expressed concern that the information being presented may lack insightful information (Johnson 2010; IRRC Institute 2016). In addition, the SEC has continued to express interest in improving the disclosure requirement (Johnson 2010; Tysiac 2016). Given the concern over the current information being provided, some have suggested information in risk factor disclosures may be overlooked (Greenberg 2007, 2008; KPMG 2011). Despite the potential shortcomings of the disclosures, researchers have provided evidence of informational value in annual and quarterly risk factor disclosures (Campbell, Chen, Dhaliwal, Lu, and Steele 2014; Filzen 2015), especially when disclosures are more specific (Hope, Hu, and Lu 2016). In this paper, we explore whether the market fully incorporates the information in updates to annual risk factor disclosures contained in quarterly reports at the time of disclosure, and whether the language used in quarterly risk factor updates affects this association.[1]

Using similar methodology as outlined in Filzen (2015), we utilize the Go Programming Language to process 10-Q filings to determine whether a firm-quarter contains a risk factor update, and construct two language-based measures that are derived from prior literature to capture how focused or specific the updates are. Our first measure is an extension of Filzen (2015) and Balakrishnan and Bartov (2011), and is meant to capture the focus of the update on

[1] We are interested in the market reaction to new information about risk factors so we focus on quarterly risk factor updates. In theory, a firm could include a deletion of a risk factor as an update. However, prior research suggests a deletion without adding a corresponding new risk factor is rare (Beatty, Cheng, and Zhang 2015; Filzen 2015). Additionally, to the extent this occurs, our findings will be biased towards not finding a result.

the risk to firm fundamentals (e.g., on sales, profits, etc.).[2] We utilize an augmented version of the wordlist used in those studies.[3] The intuition of this measure is that the more a firm uses language capturing firm fundamentals in an update, the more likely the update describes the effects of the risk factor on those fundamentals. Our second measure, how specific the disclosure is, utilizes The Stanford Natural Language Processing Group's Named Entity Recognizer (NER) tool. This tool captures specific language being used in the disclosure (e.g., people, organizations, time, percentages, etc.) and has been used in when studying annual risk factor disclosures (Hope et al. 2016).

We focus on two main tests in our analysis. First, we examine the association between risk factor updates and future unexpected earnings. We replicate that firms with risk factor updates have significantly lower future unexpected earnings in our updated sample. To account for the language used in the risk factor update in our analysis, we separate our measures (focused or specific) into terciles. We choose three groups because we anticipate that there is variation in the importance of risk factor updates being disclosed. For example, Huang, Shen, and Zang (2020) find that firms include less significant risks in annual disclosures to reduce litigation risk. We find this to be the case, that only the top two terciles of updates with focused or specific language are associated with future unexpected earnings. Thus, consistent with Huang et al. (2020), we find that vague updates are not predictive of future unexpected earnings.[4]

Second, we explore whether updates are associated with future stock returns. After controlling for the negative reaction at the time of the 10-Q filing, earnings surprises, and other

[2] Balakrishnan and Bartov (2011) examine whether risk factor information in IPO prospectuses is incorporated by analysts in their forecasts prior to the SEC's requirement of risk factor disclosure in quarterly and annual reports.
[3] We include additional words identified from quarterly filings that we believe reflect a focus on firm fundamentals, but find similar results excluding these additional words when constructing this measure.
[4] We also find the coefficients are monotonically decreasing by tercile for each measure. This further suggests that the language used can help to determine which updates are most important.

factors, we document a negative association between firms with risk factor updates and abnormal equity returns in the three months following the 10-Q filing. We focus on the three months following the 10-Q filing in our analysis because the strongest predictability of future negative earnings shocks occurs in the quarter immediately following the disclosure (Filzen 2015), and because we do not want to contaminate the returns window as additional filings are made in subsequent quarters. The negative abnormal returns to firms with risk factor updates post-filing suggests there is significant information in risk factor updates that is not being impounded into prices at the time of the 10-Q filing.

While this result is surprising, it is based purely on the presence of a risk factor update and does not incorporate the content of the disclosure. Because this result is anomalous, ex-ante, we do not have clear predictions as to which types of updates (focused/specific vs. vague) are driving this association with future abnormal returns. We find that it is neither the most focused or most vague updates driving the price drift, but rather the middle tier (i.e., less-focused updates). This result is consistent with two main ideas. First, the updates that the market will best understand the effects on firm fundamentals (and thus will likely not be associated with future returns) are risk factor updates containing the most focused and specific language. This is consistent with Filzen (2015), who finds that the market response to risk factor updates at the time of the filing is more pronounced for updates that use language which better describes the potential impacts to firm fundamentals. In addition, Hope et al. (2016) find that there is a stronger market reaction at the time of the 10-K filing to annual risk factor disclosures that are more specific. Second, if vague updates are meaningless on average (i.e., they are not predictive of future unexpected earnings), then our results also suggest the market understands this and appropriately reacts (or doesn't react) to these types of updates.

These results provide evidence that the market is adept at understanding the effects of updates that are focused, and updates that are vague. But, what about the less focused updates that are in between these two groups? For these updates, managers appear to fail to adequately describe the effects of the update on firm fundamentals, resulting in an incomplete market reaction at the time of disclosure. On the one hand, this could mean that managers are withholding useful information about the risk factor update from market participants. On the other hand, it is possible that managers themselves are not certain about the effects of the risk to firm fundamentals and are providing all information currently available to them. Overall, to the extent that managers are able to provide additional information about the risk to firm fundamentals, our results suggest that would be beneficial to investors.

To provide additional evidence on the impact of language on the completeness of the reaction to risk factor updates, we also study how sophisticated users (i.e., analysts) process quarterly risk factor updates (Ramnath, Rock, and Shane 2008; Richardson, Tuna, Wysocki 2010). Specifically, we examine how risk factor updates affect future analyst forecast properties. We measure analyst forecast dispersion and forecast error for the quarter immediately following the 10-Q filing. While we find some evidence that dispersion among analysts is higher for focused and less-focused updates, we find that underreaction (i.e., lower future forecast error) is concentrated in the middle tercile of risk factor updates (the less-focused updates) using both measures of focused and specific language. Overall, these results are consistent with our market-based tests. The degree to which risk factor updates are effectively processed by market participants depends not only on the importance of the update (i.e., being associated with future unexpected earnings) but also on the level of focused and specific language being used in the update.

Our study contributes to the literature on incomplete reactions to accounting information (e.g., Sloan 1996; You and Zhang 2009; Li 2011; Kim and Kim 2017) as well as to the literature surrounding the information content of risk factor disclosure (Campbell et al. 2014; Filzen 2015). Our results indicate that quarterly risk factor updates are associated with future negative stock returns post-disclosure, and that this association is dependent on the language used in the disclosure.[5] Further, we find the challenges in processing the information in risk factor updates is present when examining future analyst forecast properties. Predictability in post-disclosure returns suggests that the market is not fully reacting to the information contained in risk factor updates at the time of disclosure. These findings are of direct interest to investors and regulators who are interested in improving the risk factor disclosure requirement (SEC 2016).[6] To the extent that managers are able to be more focused and specific when describing risk factors, market participants will be better equipped to process the disclosures. Finally, our results suggest that measures of focus are better at parsing out the importance of updates relative to specificity.

BACKGROUND

The information content of risk factor disclosures

Historically, disclosure of risk factors has been required during the IPO process. The SEC extended this requirement to annual reports for fiscal years ending after December 1, 2005 (SEC 2005). The rule requires firms to disclose all material factors that may adversely affect the issuer's business, operations, industry or financial position, or its future firm performance under

[5] Cohen, Malloy, and Nguyen (2020) examine the underreaction to all text changes in financial reports from 1995-2014. They find that differences in the structure of the text between current and prior filings are negatively correlated with future returns, including changes in risk factors sections. There are at least two key differences between their study and ours. First, we study quarterly updates to risk factors, rather than combining analyses of 10-Ks and 10-Qs. This is important because the nature of the disclosures is different between the two types of filings. Second, their sample includes years before the risk factor disclosure requirement went into effect. Thus, their results include the effects of the implementation of the regulation itself.

[6] See also Jorgensen, Linthicum, McLelland, Taylor, and Yohn 2007 and Kohlbeck, Krische, Mangold, and Ryan 2012 for additional evidence on how accounting research impacts regulation.

"Item 1A" in the 10-K (Robbins and Rothenberg 2006).[7] Therefore, the disclosure is designed to capture all instances of downside risk. The requirement for quarterly reports differs in scope. Rather than re-disclosing all risk factors facing the firm, quarterly disclosures are reserved for updates to annual risk factors, and only if the risk factors facing the firm have changed.

Market participants, as well as the SEC, have been critical of disclosures made to date. Johnson (2010) reports that disclosures may be too broad and generic and, as a result, that the SEC is interested in reviewing the disclosure requirement for possible revision. Additionally, the SEC has been putting pressure on firms to produce better disclosures by issuing comment letters (Johnson 2010; Beatty et al. 2015). In 2011, The Institute of Chartered Accountants in England and Wales and the Global Accounting Alliance summarized the global demand for risk reporting and offered suggestions for improvements (Singleton-Green and Hodgkinson 2011). In 2016, the Investor Responsibility Research Center (IRRC) Institute echoed concerns that annual disclosures "often are generic and do not provide clear, concise and insightful information." In April of 2016, the SEC opened a three-month comment period on ways to improve current disclosure requirements, including Item 1A (SEC 2016).[8]

Academic research has also been interested in the informational value of risk factor disclosures. In the context of annual disclosures, several studies have concluded that there is informational value in the disclosures. The word "risk" has prompted many to study this disclosure in the context of volatility. However, risk factor disclosures are disclosures about potential future adverse outcomes. This seeming contradiction can be easily reconciled because we naturally expect downside risk to be correlated with upside potential. Firms take risky

[7] Materiality is not specifically defined in terms of dollar impact or probability of occurrence.
[8] On August 26, 2020 the SEC amended annual risk factor disclosure requirements by requiring generic risk factors to be presented in a separate section and a summary section if the disclosure is longer than 15 pages (SEC 2020).

positions in search of higher rewards. Thus, even though the disclosure is not about volatility per se, we could expect information in risk factor disclosures to be associated with volatility.

Consistent with the above discussion, Campbell et al. (2014) find predictable variation in the amount of disclosure based on factors that affect firm uncertainty, and that the disclosures are correlated with measures of firm uncertainty. In a specific setting regarding annual risk factor disclosures about tax positions, Campbell, Cecchini, Cianci, Ehinger, and Werner (2019) find that, on average, risky tax positions are associated with future tax savings. However, Filzen (2015) finds that quarterly risk factor updates are associated with future extreme negative earnings shocks, but finds no evidence of an association with future extreme positive shocks. Thus, although risk factor disclosures can be informative about volatility in general (especially perhaps in annual reports), the disclosures are first and foremost about downside risk.

In addition, studies have found that the market reacts negatively to risk factor disclosures at the time of filing. Filzen (2015) finds that quarterly updates to annual risk factor disclosures are associated with negative market reactions at the time of the 10-Q filing. Researchers have also found that the market reacts negatively to longer risk factor disclosures around the 10-K filing date (Campbell et al. 2014), and that more specific annual disclosures generate stronger reactions (Hope et al. 2016). Overall, these studies suggest that there is informational value in risk factor disclosures and that investors react to this information at the time of filing.

Language in Risk Factor Disclosure Updates

The language used in risk factor disclosure is also an important attribute, and prior studies examining IPOs find that firm fundamentals are more likely to be affected by a risk factor when the disclosure contains a greater focus on firm fundamentals (Balakrishnan and Bartov 2011). Filzen (2015) applies this concept to quarterly risk factor updates. He finds that focused updates

(firms with a risk factor update in the top quartile of key fundamentals word counts) drive the negative market reactions at the time of filing, suggesting these updates are most important to the market. Similarly, Hope et al. (2016) find that there is a stronger (unsigned) market reaction at the time of the 10-K filing to annual risk factor disclosures that are more specific.

In the context of quarterly updates, longer disclosures and/or key word counts may indicate a more likely, more imminent, or more material risk factor update. Alternatively, managerial discretion in writing style and repetition of previously disclosed information may not be relevant. In addition, the number of updates being disclosed may confuse this relationship. For example, a firm with one very meaningful update to a single risk factor may be more important than multiple risk factors being updated in a very minor way (Bloomfield 2012).

Overall, academic research studying risk factor disclosures concludes that there is informational value in risk factor disclosures, that the market responds to information in risk factor disclosures at the time of disclosure, and that language affects these relationships. What has yet to be studied is the extent to which the market appropriately incorporates the information being disclosed, and the impacts, if any, that the language used in the disclosure affects the incorporation of information.

RISK FACTOR UPDATES AND FUTURE UNEXPECTED EARNINGS

Consistent with the intent of the disclosure, Filzen (2015) finds that quarterly risk factor updates are associated with lower future unexpected earnings (i.e., material adverse outcomes). We begin our analysis by replicating this finding over our extended sample period, and then expand the analysis to include the language used in risk factor updates.

Sample Construction

We identify our sample of 10-Q filings from the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) database. The SEC requirement that firms update risk factors in quarterly reports began for quarters with fiscal *years* ending subsequent to December 1, 2006. As such, our initial sample covers 10-Q filings with quarters ending in the period 2006 through 2015 for firms covered by Compustat. Consistent with Filzen (2015), we restrict our initial sample to firms with a market capitalization of at least $100 million to exclude "Smaller Reporting Companies" and to avoid the problems documented by Nondorf, Singer, and You (2012).[9] Additionally, we require: 1) that the 10-Q filing be in HTML format;[10] 2) that Compustat contains data on relevant control variables for filing firms; 3) the filer be tracked by CRSP's daily stock return database; 4) that analyst data for the filer be available in I/B/E/S; and, 5) that sufficient data be available to compute post-filing abnormal returns. Additional requirements pertinent to the identification of risk factor updates further restrict the sample to 37,076 firm-quarter observations. Table 1 provides a detailed account of the sample selection process.

[Insert Table 1 here]

For each filing we extract the disclosure's Item 1A section using the Go Programming Language. The methodology for identifying filings containing a risk factor update ($Update_{it}$=1) follows Filzen (2015) and is described in detail in Appendix A. To test whether the language used in the disclosures affects the relationships in our study, we rely on two measures of focused and specific language based on prior literature. Our first measure is based on whether the disclosure contains words that imply the disclosure describes the effects of the risk factor update

[9] Firms with a public float equal to or less than $25 million were initially excluded from the requirement. In February of 2008, the SEC classified firms with a public float equal to or less than $75 million as "Smaller Reporting Companies" and granted them an exclusion from the requirement (SEC 2005). Nondorf et al. (2012) show that firms opportunistically manage their float to retain their "Smaller Reporting Company" status.
[10] We rely on both HTML tagging and regular expressions in an attempt to mitigate potential misclassifications.

on firm fundamentals. We construct a variable (*Focused*) which captures the content of the disclosure on this dimension. This measure follows Balakrishnan and Bartov (2011) and Filzen (2015) by counting the number of key words found in the disclosure. When counting words in the list, we use a Porter stemmer to capture inflections and variations of the root word. After reviewing the disclosures, we add additional word stems that 1) are commonly used in the disclosures, and 2) also appear to be related to firm fundamentals.[11] For our second measure, we utilize the Stanford Natural Language Processing Group's NER tool to identify "specific" words in annual risk factor disclosures (Hope et al. 2016). Similar to Hope et al. (2016), we use the seven-type classification scheme, counting words that refer to a location, person, organization, money, percent, date, and time. We label the key word counts from this measure as (*Specific*).[12]

To study the effect of the language used in a quarterly risk factor update on future earnings and returns, we split our *Update* variable into terciles of word counts for each measure of focus and specificity. Thus, each measure has a high, medium, and low level of focus on firm fundamentals or use of specific terms. We use the terms *Focused*, *Less-Focused*, and *Vague* to refer to these terciles, respectively.[13] Because the language used may help investors parse important from non-important updates, it is first important to study whether different levels of focused or specific updates are associated with future unexpected earnings.[14]

We construct a measure of future unexpected earnings ($\Delta Earnings_{t+1}$) as the seasonal change in quarterly earnings, scaled by total assets and multiplied by 100 for presentational purposes.

[11] A detailed description of variable calculations, including words stems is provided in Appendix C. We find similar results excluding the additional word stems when constructing this measure.
[12] While the two measures are generally distinct from one another, combining them is not advisable as some double counting of words may occur. For example, "Economic Development Administration" would be captured as containing a focused word, as well as a specific organization.
[13] We use this labeling in our tables, but when the *Specific* measure is used, the labels can be interpreted as *Specific*, *Less-Specific*, and *Vague*.
[14] We provide examples of all three types of updates (*Focused*, *Less-focused*, and *Vague*) in Appendix B.

We utilize the regression model from Filzen (2015), with the exception that we also include the length of the preceding Item 1A section from the 10-K report as an additional control for the underlying level of risk facing the firm (*Ln(10-K Item 1A)*).

$$\Delta Earnings_{it+1} = \alpha + \beta_1 Update_{it} + \beta_2 \Delta Earnings_{it} + \beta_3 Neg.\ SPI_{it} + \beta_4 Ln(Mkt\ Cap.)_{it} + \beta_5 Book\text{-}to\text{-}Market_{it} + \beta_6 Beta_{it} + \beta_7 Std.\ ROE_{it} + \beta_8 Neg.\ Earn_{it} + \beta_9 Ln(10\text{-}Q\ Length)_{it} + \beta_{10} Ln(10\text{-}K\ Item\ 1A)_{it} + \varepsilon_{it} \quad (1)$$

We include the prior change in earnings variable to control for earnings persistence ($\Delta Earnings_t$), whether the firm has a negative special item (*Neg. SPI*), size (*Ln(Market Cap.)*), a proxy for growth opportunities (*Book-to-Market*), firm risk (*Beta*), volatility in prior performance (*Std. ROE*), the number of prior four quarters the firm has experienced a loss (*Neg. Earn*), and the complexity of the filing (*Ln(10-Q Length)*). The regression specifications include fixed effects for the industry and year-quarter of the filing and compute standard errors clustered by firm.[15]

Results

We present descriptive statistics of our sample in Table 2.[16] Panel A reports descriptive statistics for the variables used in our subsequent analysis of future unexpected earnings and future stock returns. Roughly 28% of the filings in our sample contain a risk factor update, which is consistent with Filzen (2015). Thus, our identification of risk factor updates appears consistent with that of prior literature. The mean (median) $\Delta Earnings_{t+1}$ is -0.105 (0.051) over the sample period. Additionally, the mean filing abnormal return (*CAR[-1,1]*) is essentially zero. We report summary statistics on the firm characteristics we use as control variables in our subsequent multivariate regression testing in the remainder of the table.

[15] We find similar results throughout our analysis when we include two-way clustering of standard errors by firm and year-quarter.

[16] All continuous variables are winsorized at 1 and 99 percentiles to reduce the effect of outliers, consistent with prior research.

[Insert Table 2 here]

In Panel B of Table 2 we present descriptive statistics broken out by type of update. Specifically, we present the mean and median of variables for firm-quarters with no update, with *Vague* updates, *Less-Focused* updates, and *Focused* updates. Average $\Delta Earnings_{t+1}$ is decreasing monotonically from left to right in the table. This suggests not only that updates are associated with future earnings, but also that updates using more focused language are associated with lower future unexpected earnings. We also see that *Less-Focused* updates have the most negative three month buy-and-hold abnormal returns ($BHAR3mo_{it}$), suggesting that group may be responsible for any drift we observe.

In Panel C of Table 2 we present a pairwise correlation matrix of the measures used in our analysis. Pearson (Spearman) correlations are presented below (above) the diagonal. Risk factor updates are inversely correlated with $\Delta Earnings_{t+1}$ over the sample period, consistent with prior literature. For both Pearson and Spearman correlations, this relation is statistically significant at better than the 1% level. 10-Q filings containing a risk factor update have statistically significant, lower filing abnormal returns (*CAR[-1,1]*) relative to filings without a risk factor update, also consistent with prior literature. Filers with a risk factor update also tend to have higher exposure to systematic risk and lower returns in the six months preceding the filing, consistent with the findings in Campbell et al. (2014).

In Table 3, we present the results from equation (1) regarding the relationship between quarterly risk factor updates and future unexpected earnings. We find that risk factor updates are associated with lower future unexpected earnings in the quarter following the risk factor update, consistent with prior literature (Column 1). Coefficients estimates on control variables are similar to those in prior studies.

[Insert Table 3 here]

In Columns 2 and 3, we repeat our analysis with updates broken into terciles based on the degree of focused (Column 2) or specific (Column 3) language used in the update. For both measures, we see that the high and medium levels of focused and specific updates are negatively associated with future unexpected earnings in the quarter following the update. In addition, the coefficient on the lowest tercile of focused updates is negative but insignificant at conventional levels, while the coefficient on the lowest tercile of the update variable for specific words is negative and significant at the 10% level. There is a monotonic decrease in the coefficients from the highest to lowest tercile for both measures. These results suggest that the language used helps to identify the importance of the update. Finally, we note that the measure *Focused* seems to better discriminate between important and unimportant updates. Focusing on the effects to firm fundamentals appears to be more important than naming specific people, organizations, dates, etc.[17] Overall, this suggests that, while the language being used can help investors to surmise the importance of an update, for both specific and focused updates the top two terciles are both important updates that are predictive of future unexpected earnings.

RISK FACTOR UPDATES AND FUTURE RETURNS

Quarterly updates to risk factor disclosures present new information about events that are uncertain in both the likelihood and magnitude of impact if realized. This creates difficulty in predicting the future state of the firm, especially since the potential monetary impacts and assessments of probabilities are not required to be disclosed. This results in uncertainty as to the future payoff structure of the firm. Empirical evidence supports the idea of market underreaction

[17] The example of a vague update in Appendix B illustrates this point as well. The update contains a scant number of words indicating focused language, but very specific language (e.g., percentages) is used regarding updated capital requirements, suggesting that the *Focused* measure may be superior in this regard.

when information creates uncertainty. Francis, Lafond, Olsson, and Schipper (2007) find that lower earnings quality (i.e., more uncertainty about future earnings) is associated with more delay in the reaction to earnings announcements. Similarly, You and Zhang (2009) find that 10-Ks with higher levels of complexity are associated with more delayed market reactions. Overall, the complexity of the risk factor section creates uncertainty regarding the future cash flows to the firm.[18] Specifically, under current regulation, firms are required to disclose possible material events that could *adversely* affect the firm. Due to the uncertainty inherent in the information being disclosed and consistent with prior theory, we anticipate that investors will not fully incorporate the information content of risk factor disclosures at the time of release.

To evaluate the post-filing returns of 10-Q filers, we compute the filer's three month buy-and-hold abnormal return, i.e., $BHAR3mo_{it}$. For each firm, we calculate the continuously compounded buy-and-hold return over the three months beginning on the 4th trading day following the 10-Q filing and subtract the value-weighted, three-month buy-and-hold return of a corresponding size and book-to-market matched portfolio over the same period.[19,20] We utilize three-month returns for two reasons: 1) the results in Filzen (2015) and in our earlier tests suggest the risk factors being disclosed are relatively imminent on average; and, 2) so that we do not contaminate the returns period with additional 10-Q filings. Firms are matched to their corresponding size and book-to-market portfolios based on their quintile ranking from the fiscal

[18] As the disclosure is primarily focused on downside risk, the expected value of future cash flows is directly affected by the disclosure. That said, changes in risk factor disclosure could also affect the discount rate used by investors (i.e., general uncertainty). Distinguishing between these two effects is beyond the scope of our paper, although we do include controls for conventional asset pricing risk factors in our analysis.

[19] We thank Kenneth French for making the data on the size and book-to-market portfolio breakpoints publicly available: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

[20] We use a very conservative starting point for our three-month buy-and-hold returns following the 10-Q filing date. By starting on the fourth trading day following the 10-Q filing, we are allowing for four days of initial market reaction to the filing. If we start the return window immediately following the *CAR[-1,1]* 10-Q filing market reaction window (i.e., on the second trading day following the 10-Q filing), we find similar results.

year end preceding the SEC filing date. We use buy-and-hold abnormal returns to measure abnormal returns subsequent to 10-Q filings, as they reflect compounding in returns and facilitate cross-sectional analysis of the variation in abnormal returns (You and Zhang 2009).[21]

In Table 2 Panel C, we find that risk factor updates are inversely correlated with $BHAR3mo_{it}$ over the sample period. To control for variation in financial characteristics of firms at the time of the 10-Q filing, we conduct a set of cross-sectional, time-series regressions.

$$BHAR3mo_{it} = \alpha + \beta_1 Update_{it} + \beta_2\, CAR[-1,1]_{it} + \beta_3 Beta_{it} + \beta_4 Momentum_{it} + \beta_5 Ln(Market\ Cap.)_{it} + \beta_6 Book\text{-}to\text{-}Market_{it} + \beta_7 Forecast\ Error_{it} + \beta_8 Forecast\ Dispersion_{it} + \beta_9 Ln(10\text{-}Q\ Length)_{it} + \beta_{10} Volatility_{it} + \beta_{11} Loss_{it} + \beta_{12} Ln(10\text{-}K\ Item\ 1A)_{it} + \varepsilon_{it} \quad (2)$$

Following the extensive literature on post-earnings announcement drift, we include 10-Q filing abnormal returns (i.e., *CAR[-1,1]*) and earnings surprise (i.e., *Forecast Error*) as covariates. The results of prior literature suggest that the filing abnormal return and earnings surprise will be positively related to post-filing returns. To control for the risk characteristics and recent stock performance of the filing firms, we include *Beta* and *Momentum*. Prior research finds that the size and growth opportunities of the firm helps to explain the cross-sectional variation in returns (Fama and French 1993). As such, we include *Ln(Market Cap.)* and *Book-to-Market*. To control for general levels of uncertainty (Diether, Malloy, and Scherbina 2002; Zhang 2006b), we include analyst forecast dispersion (*Forecast Dispersion*) measured prior to the 10-Q filing date. To account for the complexity of the 10-Q, we include *Ln(10-Q Length)*.[22] Finally, we also include return volatility (*Volatility*), whether the firm had a loss in the current quarter (*Loss*), and the length of the Item 1A section from the preceding 10-K filing (*Ln(10-K Item 1A)*) as

[21] For a more detailed discussion of the statistical properties of buy-and-hold returns relative to cumulative abnormal returns, see Barber and Lyon (1997).

[22] We also computed the change in 10-Q length from the prior quarter to capture potential structural changes in the 10-Q over the period, consistent with Cohen et al. (2020). Our results are similar using this alternative specification.

additional controls for the underlying level of risk facing the firm. The regression specifications include fixed effects for the industry and year-quarter of the filing and compute standard errors clustered by firm.[23,24] The results of this analysis are presented in Table 4.

[Insert Table 4 here]

The results in the left column of Table 4 include the *Update* variable without factoring in the language used in the update. Firm-quarters containing an update are associated with an abnormal return of -0.39% in the time period subsequent to the filing. On average, the market reaction to quarterly risk factor updates seems to be incomplete at the time of the filing.

In Columns 2 and 3 we present the regression analyses with our *Update* variable broken up by focused or specific terciles. In both columns we find no statistically significant association between the most focused and specific updates and future returns. However, we do find that the middle tercile of updates, those that were important in predicting future earnings across both measures in Table 3, are negatively associated with future returns. This suggests that the language used in updates is associated with the completeness of the market reaction at the time of the filing. Finally, the coefficients on vague updates are statistically insignificant, suggesting the market properly incorporates the lack of information in these seemingly unimportant updates.

Overall, these results suggest that important risk factor updates lacking language to describe the risk factor's potential impacts on firm fundamentals (*Less-Focused*) or specific items (*Less-*

[23] Firm level effects such as credibility also play a role in the reaction to disclosure. While there are many factors that can affect credibility (Mercer 2004), one primary conclusion is that bad news is viewed as credible, whereas good news is dependent on credibility (Hassell, Jennings, and Lasser 1988, Hutton, Miller, and Skinner 2003). Given that risk factor updates are almost exclusively about bad news, we expect the variation of credibility in our setting to be small. Additionally, because disclosure preferences could also be firm level effects, including firm level fixed effects may control for the effect we are trying to capture. Regardless of this concern, in unreported results, we also include firm-level fixed effects to control for unobservable firm-specific characteristics and find similar results.

[24] We recognize that there may be systematic relations that exist between risk factor updates and subsequent returns driven by time trends. To ensure that our results are not driven by systematic factors (e.g., the regulation adoption period or the financial crisis) we repeat our analysis over the period January 1, 2010 through December 31, 2015). We find our results are consistent in this more recent time period.

Specific) contributes to investor underreaction at the announcement of the risk factor update. While this is an important finding, one limitation of this analysis is that we don't know whether this is due to an intentional lack of focused and specific language, or whether managers truly do not know the specific effects of the updated risk factor at the time of filing. In either case, it appears that the better managers are at relaying the specific effects on firm fundamentals, the better the market understands the implications of the quarterly risk factor update.

RISK FACTOR UPDATES AND ANALYST FORECAST PROPERTIES

In this study, we find that the market response to risk factor updates is incomplete at the time of the 10-Q filing and that the content of the update is related to the completeness of the market reaction. To complement this analysis, we study how sophisticated users (i.e., analysts) process this information. Ramnath et al. (2008) and Richardson et al. (2010) encourage authors to explore whether sophisticated users of financial information completely process information to present comprehensive evidence for incomplete information processing, rather than relying on market-based tests alone. Ramnath et al. (2008) suggest that additional tests based on analysts' forecasts dispel the criticism that market-based tests simply have an omitted risk factor.

We examine the impact of risk factor updates on future analyst forecast dispersion and signed future analyst forecast error to test whether analysts appropriately incorporate the information. Specifically, we examine forecast properties for the following quarter, using the first consensus forecast period following the disclosure of risk factor update information. We measure future analyst dispersion ($Dispersion_{t+1}$) as the standard deviation of analysts' earnings forecasts (for the next quarterly period) from the first consensus forecast issued after the 10-Q filing, scaled by share price 90 days prior to the 10-Q filing date (Lang and Lundholm 1996). Future analyst forecast error ($Error_{t+1}$) is measured as the difference between future actual earnings and the first

consensus quarterly earnings forecast (for the next quarterly filing period) issued after the 10-Q filing, scaled by share price 90 days prior to the 10-Q filing date (Lang and Lundholm 1996). We require that the consensus earnings forecast be generated within 90 days of the 10-Q filing and must occur before the next EPS report date.

Our prediction related to the properties of analysts' forecasts directly follows from the preceding market-based analysis. As such, we expect updates classified as being *Less-Focused* to have greater forecast dispersion and more negative forecast error in the quarter immediately following that disclosure, relative to firms without risk factor updates. In other words, if the information about risk factor updates (that are associated with lower unexpected earnings, but use less focused language) is difficult to incorporate, we expect more disagreement and lower forecast error (i.e., more negative or less positive forecast error) among analysts in the quarter following the update. To test this prediction, we estimate the following regression:

$$\begin{aligned} FORECAST\ PROPERTY_{it+1} = {} & \alpha + \boldsymbol{\delta Update\ Tercile_{it}} + \beta_2 Loss_{it} + \beta_3 Ln(Numest)_{it} + \beta_4 CAR[-1,1]_{it} \\ & + \beta_5\ Ln(Market\ Cap.)_{it} + \beta_6 Beta_{it} + \beta_7 Momentum_{it} + \beta_8 Book\text{-}to\text{-}Market_{it} \\ & + \beta_9 Ln(10\text{-}Q\ Length)_{it} + \beta_{10} Ln(10\text{-}K\ Item\ 1A)_{it} + \beta_{11} Volatility_{it} + \beta_{12} R\&D\ Indicator_{it} \\ & + \beta_{13} Lag\ Forecast\ Property_{it} + \varepsilon_{it} \end{aligned} \quad (3)$$

In equation (3) above, *FORECAST PROPERTY* represents one of the two future analyst forecast property variables discussed above ($Dispersion_{t+1}$ or $Error_{t+1}$). ***Update Tercile*** represents a vector of three measures capturing the tercile of focused or specific language for firms with a risk factor update in the current quarter. We include important control variables from prior research that have been shown to be associated with analyst forecast properties. Hwang, Jan, and Basu (1996) find that earnings are harder to predict for firms with losses, thus we include an indicator variable for whether the firm had a loss in the current quarter (*Loss*). We include

analyst following (*Ln(Numest)*) as a proxy for competitiveness amongst analysts (Lys and Soo 1995) as well as the firm information environment (Hope 2003). To proxy for disclosure informativeness (Lehavy, Li, and Merkley 2011) and surprise in earnings (Lang and Lundholm 1996), we include the cumulative abnormal return around the 10-Q filing (*CAR[-1,1]*). Size [*Ln(Market Cap.)*], *Beta*, *Momentum*, and *Book-to-Market* control for fundamental risk (Liu and Natarajan 2012), and have been cited as proxies for the information environment analysts face, growth opportunities, financial distress, and additional information revealed to the market that might affect forecast behavior (Zhang 2006a). In addition, we include the length of the Item 1A section from the preceding 10-K filing (*Ln(10-K Item 1A)*) as an additional control for the underlying level of risk facing the firm. We include the length of the 10-Q to control for reporting complexity (Loughran and McDonald 2014; Lehavy et al. 2011), and the standard deviation of the daily equity returns in the 6-months preceding the 10-Q filing date (*Volatility*) to control for volatility in the forecasting environment (Lang and Lundholm 1996). Finally, we include an indicator variable for firms that invest in R&D (*R&D Indicator*) as it may be more difficult to forecast earnings for firms with R&D related intangibles (Liu and Natarajan 2012; Gu and Wang 2005). Finally, we include current forecast error or dispersion in the respective tests to control for time-series correlation of these variables.

Columns (1) and (2) of Table 5 present the results exploring the association between risk factor language and analyst forecast properties using the focus on firm fundamentals word list as the basis for the tercile split of the *Update* variable. Columns (3) and (4) present the results using specific words from the Stanford NER tool. Overall, the results are consistent with our prior results. Across both definitions of focused and specific language, the coefficient estimates on the *Less-Focused* (or *Less-Specific*) tercile suggest that analysts face increased difficulty in

interpreting the impact of risk factor updates for those types of risk factor updates. Future forecast dispersion is higher and signed future forecast error is lower for this tercile of risk factor updates.[25] In column 3 we do find some evidence that the most specific updates create disagreement among analysts as well (i.e., higher dispersion). However, the coefficient on the consensus forecast error is not statistically significant for the most specific updates, suggesting that even though there is more disagreement, the consensus estimate does not appear to reflect underreaction for updates containing the most specific language.[26] Overall, the evidence presented is consistent with our primary findings, i.e., for risk factor updates that are predictive of lower future unexpected earnings, updates containing less focused or specific language contribute to underreaction to the information being provided.

[Insert Table 5 here]

CONCLUSION

We examine whether the market reaction to quarterly risk factor updates is complete at the time of the 10-Q filing. We find quarterly risk factor updates are negatively associated with future abnormal equity returns. Further, we explore how the content of the disclosure affects this phenomenon. Specifically, we use two measures to classify risk factor updates as focused or specific based on the prevalence of words used in the disclosure that focus on firm fundamentals or specifics of the risk factor. Our results suggest that after considering the ability to of an update to predict lower future abnormal earnings, risk factor updates containing less focused or specific language are associated with negative future abnormal returns, while updates that contain more

[25] We report analyst forecast error using actual EPS from IBES. However, managers and analysts may exclude some non-recurring items when deciding on the IBES actual EPS number (Doyle, Lundholm, and Soliman 2003; Bradshaw 2011). This process may exclude effects from the realization of a risk factor update and bias us against finding results. As an alternative, we use the approach from Doyle et al. (2003) and define actual EPS in forecast error using EPS from Compustat and find similar results.

[26] As discussed earlier, the *Specific* measure may not be as useful at parsing out the importance of updates.

focused or specific language are not associated with future abnormal returns. In other words, there appears to be a more complete reaction to the information contained in an average risk factor update when the update better describes the risk factor's potential effects on firm fundamentals. We confirm this result by examining how sophisticated users of financial reports, i.e., analysts, respond to risk factor updates. Overall, we find that analyst underreaction is concentrated in the same group of risk factor update type as the market underreaction.

Our findings are important for investors and regulators who are interested in improving the risk factor disclosure requirement. We provide evidence that not only are risk factor updates associated with future abnormal returns, but also that the content of the disclosure affects the relationship. This finding suggests that to the extent that managers are able to be more specific and focused on firm fundamentals when describing risk factors, market participants will be better equipped to process the disclosures. Our results do not, by themselves, suggest that managers are intentionally withholding focused and specific language. It is also possible that the language being used accurately reflects the information that managers had at the time of the disclosure. In other words, it is possible that the lack of focused and specific language properly reflects the increased uncertainty about how the risk factor will affect the firm.

There are some limitations to our study and opportunities for future research. Our analysis uses a computer algorithm to help classify observations. There are many advantages to this methodology, including the ability to process many filings relatively quickly. However, as with all studies that use computer-assisted data collection techniques, there will always be some error in the process – which we expect to be random in nature. In regard to future research, we believe there is a great deal of opportunity to improve our understanding of the impact that risk factor disclosure content has on the predictability of future returns documented in this study.

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APPENDIX A: IDENTIFYING RISK FACTOR UPDATES

Following Filzen (2015), a firm is assumed to have an update if three conditions are satisfied:

1. the filing must contain a risk factor section
2. the section must contain at least 200 words; and
3. for the second and third quarters of the fiscal year, the section must be at least 100 words longer than the previously disclosed risk factor section.

The logic underpinning the first of these conditions is self-explanatory. By definition, a filing cannot be determined to include a risk factor update if it does not contain a risk factor section. The second condition is necessary as many firms include a risk factor section, but simply use the section to restate the disclosure requirement and state that there have been no material updates. The third condition in necessary because the SEC requires that once a firm discloses an update, the same update remains in the Item 1A section until the firm's next 10-K filing. If all three conditions are met, then the quarterly disclosure is said to contain a risk factor update.

Filings which fail to meet the criteria to be classified as a firm-quarter containing an update are not unilaterally classified as not containing an update. Quarterly disclosures are classified as not having an update if the filing:

1. does not contain a risk factor section; or,
2. contains a risk factor section with less than 100 words.

If these conditions are met, then the firm is said to not have a risk factor update in that quarter. We exclude firm-quarters with risk factor section word counts between 100 and 200 words to avoid ambiguity regarding the occurrence of an update.[27]

[27] Implementing a strict cutoff of 150 words to identify firm-quarters with/without risk factor updates produces qualitatively similar results.

APPENDIX B: RISK FACTOR UPDATE EXAMPLES

Focused Update Example: Excerpt from Cutera, Inc., 2007 Q3

ITEM 1A. RISK FACTORS

Our revenue and earnings are difficult to predict and our inability to provide public guidance could harm our business, and our stock price might become more volatile and could decline.

We historically provided guidance to the investment community regarding our anticipated future operating performance, both for the coming quarters and fiscal year. However, for the fourth quarter ending December 31, 2007, due to the following factors, we were unable to accurately forecast our revenue and earnings, therefore, have decided to discontinue giving financial guidance and have withdrawn our previously-provided financial guidance:

- Some of our publicly-traded competitors have reported reduced growth rates for the third quarter ended September 30, 2007, which could indicate signs of a slowing market growth rate;
- There has been a slower-than-expected adoption of our new Pearl product by new customers;
- The sales productivity of our recently-hired U.S. sales professionals has not increased to our expected level;
- We have short sales cycles in our business; and
- Many of our customer orders in any given quarter are received during the last month of a quarter, which results in uncertainties in our ability to ship our products by the end of the quarter.

Due to our inability to provide public guidance, and if in the future our actual results are below the expectations of third party financial analysts, our business could be harmed, the volatility of our stock price could increase, and our stock price could decline significantly as a result.

Less-Focused Update Example: Excerpt from MF Global LTD., 2009 Q2

Item 1A. Risk Factors

We plan to change the jurisdiction of incorporation of our parent to improve our position in light of, and increase our flexibility to respond to, the current and anticipated competitive and regulatory landscape and to become a primary dealer for the Federal Reserve Bank of New York, but we have no control over the changes in the regulatory landscape nor can we offer any guarantee that the Federal Reserve Bank of New York will approve our application to become a primary dealer.

We are changing the jurisdiction of incorporation of our parent in order to improve our position in light of, and increase our flexibility to respond to, the current and anticipated competitive and regulatory landscape. We believe that changing our corporate domicile from Bermuda to Delaware will give our existing and potential clients, creditors and other counterparties greater comfort that we are fully subject to the current and evolving U.S. regulatory regime. However, we have no control over the direction or extent of the financial reforms that are now under consideration in Congress or their potential impact upon our business plans and future earnings.

Changing the jurisdiction of incorporation of our parent would also facilitate our becoming a primary dealer for the Federal Reserve Bank of New York (the "Federal Reserve"). In order to become a primary dealer under the existing rules of the Federal Reserve, a company must be incorporated in an approved jurisdiction, a category that includes Delaware but does not currently include Bermuda. However, we have received no assurance from the Federal Reserve that we will be approved as a primary dealer if we change our jurisdiction of incorporation, and we cannot guarantee that we will become a primary dealer or assure you as to the timing of any such event. If our application is denied, our business plans and future earnings potential could be adversely affected. Moreover, even if we become a primary dealer, there is no assurance that we will be able to realize potential new benefits to our business or that any such benefits would not be offset by new costs or risks associated with acting as a primary dealer.

Vague Update Example: Excerpt from Trustco Bank Company NY, 2013 Q3

Item 1A. Risk Factors

The short-term and long-term impact of the changing regulatory capital requirements and new capital rules is uncertain.

In July 2013, the Federal Deposit Insurance Corporation and the Federal Reserve Board approved a new rule that will substantially amend the regulatory risk-based capital rules applicable to the Company and the Bank. The final rule implements the "Basel III" regulatory capital reforms and changes required by the Dodd-Frank Act.

The final rule includes new minimum risk-based capital and leverage ratios, which will be effective for the Company and the Bank on January 1, 2015, and refines the definition of what constitutes "capital" for purposes of calculating these ratios. The new minimum capital requirements will be: (i) a new common equity Tier 1 capital ratio of 4.5%; (ii) a Tier 1 to risk-based assets capital ratio of 6% (increased from 4%); (iii) a total capital ratio of 8% (unchanged from current rules); and (iv) a Tier 1 leverage ratio of 4%. The final rule also establishes a "capital conservation buffer" of 2.5% above the new regulatory minimum capital ratios, and will result in the following minimum ratios: (i) a common equity Tier 1 capital ratio of 7.0%, (ii) a Tier 1 to risk-based assets capital ratio of 8.5%, and (iii) a total capital ratio of 10.5%. The new capital conservation buffer requirement would be phased in beginning in January 2016 at 0.625% of risk-weighted assets and would increase each year until fully implemented in January 2019. We will be subject to limitations, as stipulated in the new rules, on paying dividends, engaging in share repurchases, and paying discretionary bonuses if our capital level falls below the buffer amount.

The application of more stringent capital requirements for the Company and the Bank could, among other things, result in lower returns on equity, require the raising of additional capital, and result in regulatory actions such as the inability to pay dividends or repurchase shares, if we were to be unable to comply with such requirements. Management is currently evaluating the provisions of the final rules and their expected impact on the Company. Based on the Company's current balance sheet composition and capital levels, management believes that the Company will be in compliance with the new requirements.

APPENDIX C: VARIABLE DEFINITIONS

This appendix defines the variables used in our analysis. All continuous variables are winsorized at 1 and 99 percentiles to reduce the influence of outliers. Variable names identified in the definition column correspond to the Compustat Xpressfeed dataset.

Variable	Definition
Panel A: Primary Variables	
Update	Firms are classified as having a risk factor update (Update=1) if the Item 1A word count exceeds 200 words and is greater than the prior period's word count by at least 100 words (for Q2 and Q3 filings). Firms are classified as not having an update (Update=0) if their Item 1A word count is less than 100 words or if the word count does not exceed the prior period's count by at least 100 words (for Q2 and Q3 filings).
Focused	Key word count of focused word stems to capture the focus of the risk factor update on firm fundamentals.[28] Updates are broken into terciles of focus in our analysis, with the three groupings labeled *Focused*, *Less-Focused*, and *Vague*.
Specific	Key word count from the Stanford Natural Language Processing Group's NER tool using the seven-type classification: location, person, organization, money, percent, date, and time.[29] Updates are broken into terciles in our analysis, with the three groupings labeled *Specific*, *Less-Specific*, and *Vague*.
BHAR3mo	The three-month buy-and-hold return (beginning on the fourth day following the 10-Q filing) of a given firm less the value-weighted, three-month buy-and-hold return of a size and book-to-market matched portfolio of firms.
ΔEarnings$_{t+1}$	The seasonal change in quarterly earnings scaled by total assets and multiplied by 100.
CAR[-1,1]	The three-day cumulative abnormal return beginning on the day preceding the 10-Q filing and ending one day after the filing. Abnormal returns are computed as the raw firm return less the CRSP value-weighted market returns.
Beta	The firm's market model beta computed using daily returns over a six-month period preceding the 10-Q filing, ending 30 days before the filing date.
Momentum	The buy-and-hold return to the firm over a six-month period preceding the 10-Q filing ending 30 days prior to the filing date.
Volatility	The standard deviation of the daily equity returns over a six-month period preceding the 10-Q filing date, ending 30 days prior to the filing date.
***Ln*(Market Cap.)**	The natural log of the firm's market value of equity (i.e., Ln(prccq*cshoq)).
Book-to-Market	The ratio of the firm's book value of equity to its market value of equity.
Forecast Error	The difference between the IBES actual earnings per share at quarter end and the median analyst estimate from the last consensus forecast issued before the 10-Q filing, scaled by the firm's share price 90 days prior to the 10-Q filing date.

[28] The stems used from the original word list from Balakrishnan and Bartov (2011) and Filzen (2015) are: bankrupt, busi, cash, charg, competit, condit, cost, custom, cyclic, demand, divis, earn, econom, environ, expens, financi, incom, lawsuit, legal, liquid, litig, market, oper, product, profit, revenu, sale, season, servic, settlement, solvenc, spend, and sue. We add the following additional word stems to the measure: accru, accrual, allow, asset, defer, deferr, effici, illiquid, ineffici, liabil, liabl, nonoper, overproduct, overrun, oversuppli, reserv, return, solvent, spent, tax, taxabl, turnov, and valuat.

[29] The named entity recognizer is not dictionary based, but instead is machine-learning based and is trained on a corpus of tagged data. See https://nlp.stanford.edu/software/CRF-NER.html for a complete description.

Forecast Dispersion	The standard deviation of analysts' earnings forecasts from the last consensus forecast issued before the 10-Q filing, scaled by the firm's share price 90 days prior to the 10-Q filing date.
Loss	An indicator variable which takes a value of 1 if the firm reported a negative value for income before extraordinary items in its 10-Q filing, and 0 otherwise.
Neg. SPI	An indicator variable which takes a value of 1 if the firm reported a negative special item in its 10-Q filing, and 0 otherwise.
Std. ROE	The standard deviation of return on equity over the most recent five fiscal year ends preceding the quarterly filing.
Neg. Earn	A count of the number of the prior four quarters with negative earnings.
***Ln*(10-Q Length)**	The natural log of total words contained in the 10-Q filing less the words contained in the risk factor section of the 10-Q (i.e., *Ln*(total words - Item 1A words)).
***Ln*(10-K Item 1A)**	The natural log of total words contained in the Item 1A section of the firm's most recent prior 10-K filing.
Panel B: Additional Analyst Variables	
Dispersion$_{t+1}$	The standard deviation of analysts' earnings forecasts from the *first* consensus forecast issued after the 10-Q filing for the next quarterly period, scaled by share price 90 days prior to the 10-Q filing date.
Error$_{t+1}$	The difference between future IBES actual earnings and the *first* consensus earnings forecast issued after the 10-Q filing for the next quarterly filing period, scaled by share price 90-days prior to the 10-Q filing date.
***Ln*(Numest)**	The natural log of the count of the number of analysts issuing a forecast in a given reporting period.
R&D Indicator	An indicator variable which takes a value of 1 if a firm reports R&D expenditure during the quarter, and 0 otherwise.

TABLE 1: SAMPLE CONSTRUCTION

10-Q filings from EDGAR tracked on *Compustat* with fiscal year ends between 2006-2015 and Market Cap. ≥ $100 *mil*	87,853
Less	
Error with Item-1A pull	-4,093
Missing prior 10-K for control variable	-11,198
Ambiguous length to compute risk update	-17,083
Insufficient CRSP data to compute buy and hold returns	-4,515
Missing Compustat data	-1,137
Insufficient I/B/E/S data	-12,751
Final Sample Firm-Quarters	37,076

This table details the sample selection procedure. The universe of potential observations consists of all quarterly reports from the SEC Edgar server filed between January 1st, 2006 and December 31st, 2016. To be included in the initial sample, firms must be tracked by Compustat with fiscal *year* ends subsequent to December 1, 2006 up to fiscal years ending in 2015 and must have a market capitalization of at least $100 million.

TABLE 2: DESCRIPTIVE STATISTICS OF RISK FACTOR UPDATES

Panel A: Summary Statistics

	Firm-Quarters/ Updates	Mean	Median	Standard Deviation	5th Percentile	25th Percentile	75th Percentile	95th Percentile
Update	37076/10517	0.2837	0.0000	0.4508	0.0000	0.0000	1.0000	1.0000
BHAR3mo	37076/10517	-0.0040	-0.0047	0.1497	-0.2509	-0.0862	0.0745	0.2506
$\Delta Earnings_{t+1}$	37076/10517	-0.1047	0.0507	3.0439	-4.3298	-0.4436	0.5651	3.3130
CAR[-1,1]	37076/10517	0.0000	-0.0001	0.0758	-0.1292	-0.0363	0.0386	0.1273
Beta	37076/10517	1.1598	1.1153	0.4766	0.4468	0.8328	1.4362	2.0348
Momentum	37076/10517	0.0640	0.0468	0.2834	-0.3811	-0.1008	0.2011	0.5663
Volatility	37076/10517	0.0247	0.0215	0.0132	0.0103	0.0154	0.0301	0.0510
Ln(Market Cap.)	37076/10517	7.3542	7.2000	1.5145	5.1558	6.1919	8.3140	10.1653
Book-to-Market	37076/10517	0.5338	0.4626	0.3854	0.0626	0.2611	0.7363	1.2506
Forecast Error	37076/10517	0.0003	0.0005	0.0078	-0.0097	-0.0008	0.0023	0.0101
Dispersion	37076/10517	0.0614	0.0526	0.4050	-0.4167	0.0204	0.1250	0.5000
Loss	37076/10517	0.1995	0.0000	0.3996	0.0000	0.0000	0.0000	1.0000
Neg. SPI	37076/10517	0.3840	0.0000	0.4864	0.0000	0.0000	1.0000	1.0000
Std. ROE	37076/10517	0.3911	0.0682	1.2897	0.0111	0.0308	0.1960	1.5673
Neg. Earn	37076/10517	0.8046	0.0000	1.2948	0.0000	0.0000	1.0000	4.0000
Ln(10-Q Length)	37076/10517	11.1712	11.3977	1.1965	9.4070	9.9902	12.1232	13.0011
Ln(10-K Item 1A)	37076/10517	5.8363	5.9322	0.7502	4.6728	5.4889	6.3135	6.8057

Table 2 presents descriptive statistics for the sample of firm-quarters covered in the sample period. Firms are classified as having a risk factor update (*Update*=1) if the Item 1A word count exceeds 200 words and is greater than the prior period's word count by at least 100 words during the same fiscal year. Panel A reports the descriptive statistics for the sample. Panel B reports descriptive statistics by the degree of focus in the update. Panel C presents a correlation matrix of the variables used in our analysis. Pearson (Spearman) correlations are presented below (above) the diagonal. Statistical tests on the relation between variables are performed for both measurements of correlation. Results are presented to the right of each correlation statistic where *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively. Variable definitions are provided in Appendix C.

TABLE 2: (CONTINUED)

Panel B: Descriptive Statistics by Degree of Focus

	No Update (n=26,559)		**Vague Update** (n=3,323)		**Less-Focused Update** (n=3,341)		**Focused Update** (n=3,3853)	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**	**Mean**	**Median**
BHAR3mo	-0.0043	-0.0038	-0.0055	-0.0082	-0.0113	-0.0121	0.0052	-0.0038
$\Delta Earnings_{t+1}$	0.0017	0.0634	-0.2012	0.0339	-0.3856	-0.0021	-0.5110	-0.0801
CAR[-1,1]	0.0014	0.0007	0.0000	-0.0001	-0.0064	-0.0053	-0.0044	-0.0029
Beta	1.1453	1.1033	1.1485	1.0970	1.1795	1.1304	1.2521	1.2040
Momentum	0.0685	0.0523	0.0508	0.0286	0.0332	0.0223	0.0709	0.0337
Volatility	0.0231	0.0199	0.0264	0.0234	0.0282	0.0249	0.0312	0.0287
Ln(Market Cap.)	7.4099	7.2647	7.3271	7.2254	7.2859	7.1705	7.0535	6.7774
Book-to-Market	0.5442	0.4788	0.5883	0.5121	0.5569	0.4584	0.3951	0.3164
Forecast Error	0.0003	0.0004	0.0001	0.0005	-0.0003	0.0004	0.0009	0.0008
Dispersion	0.0720	0.0545	0.0792	0.0667	0.0406	0.0513	-0.0085	0.0250
Loss	0.1477	0.0000	0.2094	0.0000	0.2906	0.0000	0.4690	0.0000
Neg. SPI	0.3748	0.0000	0.3822	0.0000	0.4166	0.0000	0.4210	0.0000
Std. ROE	0.3335	0.0592	0.3984	0.0742	0.5062	0.0897	0.6823	0.1687
Neg. Earn	0.6183	0.0000	0.8504	0.0000	1.0883	0.0000	1.8033	1.0000
Ln(10-Q Length)	11.2016	11.4629	11.1483	11.2202	11.0244	10.8473	11.1091	11.3899
Ln(10-K Item 1A)	5.7244	5.8201	5.9191	6.0014	5.9071	5.9296	6.4751	6.4953

Panel C: Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Update	**1.000**	-0.019***	-0.050***	-0.019***	0.038***	-0.038***	0.201***	-0.048***	-0.063***
(2) BHAR3mo	-0.020***	**1.000**	0.056***	0.039***	-0.034***	-0.009	-0.054***	0.032***	0.003
(3) $\Delta Earnings_{t+1}$	-0.056***	0.042***	**1.000**	0.113***	0.014**	0.213***	-0.047***	0.066***	-0.143***
(4) CAR[-1,1]	-0.030***	0.037***	0.090***	**1.000**	0.015**	-0.021***	0.018**	0.005	0.005
(5) Beta	0.048***	-0.030***	0.000	0.006	**1.000**	-0.003	0.520***	-0.139***	0.035***
(6) Momentum	-0.025***	-0.010*	0.161***	-0.013**	0.030***	**1.000**	-0.152***	0.152***	-0.218***
(7) Volatility	0.194***	-0.035***	-0.065***	0.013**	0.486***	-0.120***	**1.000**	-0.448***	0.028***
(8) *Ln*(Market Cap.)	-0.058***	0.030***	0.051***	0.008	-0.133***	0.121***	-0.396***	**1.000**	-0.259***
(9) Book-to-Market	-0.043***	0.012**	-0.093***	0.019***	0.084***	-0.249***	0.147***	-0.232***	**1.000**
(10) Forecast Error	-0.006	0.021***	0.102***	0.266***	-0.016**	0.074***	-0.036***	0.048***	-0.039***
(11) Forecast Dispersion	-0.041***	0.017**	0.015**	0.012**	-0.035***	0.003	-0.064***	0.032***	0.035***
(12) Loss	0.206***	-0.048***	-0.134***	-0.108***	0.147***	-0.077***	0.336***	-0.267***	0.015**
(13) Neg. SPI	0.030***	0.009	-0.002	-0.001	0.028***	-0.016**	-0.033***	0.129***	-0.012**
(14) Std. ROE	0.071***	-0.012**	-0.031***	-0.008	0.065***	0.016**	0.138***	-0.051***	-0.210***
(15) Neg. Earn	0.229***	-0.046***	-0.032***	-0.048***	0.186***	-0.040***	0.396***	-0.313***	0.009
(16) *Ln*(10-Q Length)	-0.040***	0.052***	0.002	-0.014**	-0.056***	0.060***	-0.310***	0.302***	0.082***
(17) *Ln*(10-K Item 1A)	0.237***	-0.005	-0.020***	-0.014**	0.013**	0.022***	0.103***	-0.062***	0.001

TABLE 2: (CONTINUED)

Panel C: Correlation Matrix

	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) Update	0.025***	-0.054***	0.193***	0.033***	0.158***	0.186***	-0.037***	0.278***
(2) BHAR3mo	0.030***	0.005	-0.051***	0.009*	-0.044***	-0.047***	0.054***	-0.006
(3) ΔEarnings$_{t+1}$	0.143***	-0.015**	-0.127***	-0.015**	-0.009*	0.001	-0.016**	-0.017**
(4) CAR[-1,1]	0.377***	0.016**	-0.098***	0.003	-0.002	-0.033***	-0.013**	-0.003
(5) Beta	0.038***	-0.002	0.114***	0.032***	0.197***	0.147***	-0.065***	0.004
(6) Momentum	0.088***	-0.006	-0.092***	-0.009	-0.016**	-0.070***	0.085***	0.014**
(7) Volatility	0.062***	0.040***	0.307***	-0.020***	0.393***	0.361***	-0.344***	0.128***
(8) *Ln*(Market Cap.)	0.024***	-0.050***	-0.257***	0.132***	-0.162***	-0.296***	0.305***	-0.055***
(9) Book-to-Market	0.014**	0.188***	-0.016**	-0.020***	-0.260***	0.038***	0.108***	-0.028***
(10) Forecast Error	**1.000**	0.013**	-0.137***	-0.015**	0.035***	-0.024***	-0.001	0.043***
(11) Forecast Dispersion	0.046***	**1.000**	-0.270***	-0.006	0.006	-0.131***	0.040***	0.004
(12) Loss	-0.233***	-0.210***	**1.000**	0.079***	0.334***	0.733***	-0.048***	0.216***
(13) Neg. SPI	-0.030***	0.001	0.075***	**1.000**	0.088***	0.081***	0.174***	0.101***
(14) Std. ROE	-0.022***	-0.039***	0.156***	0.024***	**1.000**	0.416***	-0.061***	0.214***
(15) Neg. Earn	-0.112***	-0.206***	0.805***	0.046***	0.195***	**1.000**	-0.035***	0.247***
(16) *Ln*(10-Q Length)	0.008	0.016**	-0.046***	0.173***	-0.006	-0.048***	**1.000**	0.297***
(17) *Ln*(10-K Item 1A)	0.024***	-0.023***	0.182***	0.081***	0.075***	0.217***	0.261***	**1.000**

TABLE 3: RISK FACTOR UPDATES AND FUTURE UNEXPECTED EARNINGS

		Focused	Specific
Dependent Variable: ΔEarnings$_{t+1}$	**(1)**	**(2)**	**(3)**
Update (1 if yes)	-0.2037***		
	(-4.837)		
Focused Update (1 if yes)		-0.4133***	-0.3791***
		(-5.229)	(-4.984)
Less-Focused Update (1 if yes)		-0.2077***	-0.1726***
		(-3.236)	(-2.792)
Vague Update (1 if yes)		-0.0528	-0.1055*
		(-0.904)	(-1.803)
ΔEarnings	0.3595***	0.3595***	0.3594***
	(20.792)	(20.785)	(20.782)
Neg. SPI	0.1504***	0.1482***	0.1483***
	(4.282)	(4.208)	(4.216)
Ln(Market Cap.)	0.0589***	0.0605***	0.0588***
	(4.926)	(5.039)	(4.912)
Book-to-Market	-1.1212***	-1.1287***	-1.1284***
	(-16.234)	(-16.288)	(-16.288)
Beta	0.0339	0.0390	0.0384
	(0.779)	(0.896)	(0.883)
Std. ROE	-0.0915***	-0.0913***	-0.0907***
	(-3.898)	(-3.889)	(-3.857)
Neg. Earn	0.1943***	0.1996***	0.1989***
	(10.483)	(10.657)	(10.658)
Ln(10-Q Length)	-0.0631***	-0.0647***	-0.0630***
	(-2.975)	(-3.054)	(-2.965)
Ln(10-K Item 1A)	-0.0017	0.0092	0.0068
	(-0.075)	(0.398)	(0.292)
Constant	0.3945*	0.3437	0.3459
	(1.701)	(1.483)	(1.490)
Observations	37,076	37,076	37,076
Adj. R^2	0.124	0.124	0.124

This table reports coefficient estimates from ordinary-least-squares regression estimation on the relation between the seasonal change in quarterly earnings ($\Delta Earnings_{t+1}$), risk factor updates (*Update*), focused risk factor updates (*Focused Update, Less-Focused Update,* and *Vague Update*), and a vector of control variables. $\Delta Earnings_{t+1}$ is computed as the seasonal change in quarterly earnings scaled by total assets and multiplied by 100 for presentational purposes. All specifications include fixed effects for industry and year-quarter and compute robust standard errors clustered by firm. *t*-statistics are presented in parentheses. Remaining variable definitions are provided in Appendix C. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

TABLE 4: RISK FACTOR UPDATES AND FUTURE ABNORMAL RETURNS

		Focused	Specific
Dependent Variable: BHAR3mo	**(1)**	**(2)**	**(3)**
Update (1 if yes)	-0.0039*		
	(-1.827)		
Focused Update (1 if yes)		0.0019	0.0005
		(0.518)	(0.127)
Less-Focused Update (1 if yes)		-0.0101***	-0.0077***
		(-3.175)	(-2.612)
Vague Update (1 if yes)		-0.0024	-0.0030
		(-0.823)	(-0.931)
CAR[-1,1]	0.0585***	0.0582***	0.0587***
	(4.364)	(4.341)	(4.375)
Beta	0.0099***	0.0099***	0.0099***
	(3.629)	(3.625)	(3.628)
Momentum	0.0102**	0.0101**	0.0103***
	(2.573)	(2.554)	(2.592)
Ln(Market Cap.)	-0.0029***	-0.0029***	-0.0029***
	(-3.939)	(-3.979)	(-3.974)
Book-to-Market	0.0082**	0.0084**	0.0084**
	(2.296)	(2.374)	(2.358)
Forecast Error	0.4926***	0.4843***	0.4868***
	(3.139)	(3.092)	(3.104)
Forecast Dispersion	0.0020	0.0020	0.0020
	(0.834)	(0.829)	(0.840)
Ln(10-Q Length)	0.0055***	0.0056***	0.0055***
	(4.765)	(4.828)	(4.768)
Volatility	-0.3923**	-0.3989**	-0.4056**
	(-2.424)	(-2.466)	(-2.507)
Loss	-0.0157***	-0.0159***	-0.0160***
	(-5.574)	(-5.650)	(-5.652)
Ln(10-K Item 1A)	-0.0011	-0.0014	-0.0013
	(-0.881)	(-1.174)	(-1.051)
Constant	-0.0658***	-0.0645***	-0.0643***
	(-4.887)	(-4.790)	(-4.772)
Observations	37,076	37,076	37,076
Adj. R^2	0.045	0.045	0.045

This table reports coefficient estimates from ordinary-least-squares regression estimation on the relation between three-month buy-and-hold abnormal returns (*BHAR3mo*), risk factor updates (*Update*), focused risk factor updates (*Focused Update, Less-Focused Update,* and *Vague Update*), and a vector of control variables. *BHAR3mo* is computed as the three-month buy-and-hold return (beginning on the fourth day following the 10-Q filing) of a given firm less the value-weighted, three-month buy-and-hold return of a size and book-to-market matched portfolio. All specifications include fixed effects for industry and year-quarter and compute standard errors clustered by firm. *t*-statistics are presented in parentheses. Remaining variable definitions are provided in Appendix C. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

TABLE 5: RISK FACTOR UPDATES AND ANALYST FORECAST PROPERTIES

	Focused		Specific	
	(1)	(2)	(3)	(4)
Dependent Variable:	**Dispersion$_{t+1}$**	**Error$_{t+1}$**	**Dispersion$_{t+1}$**	**Error$_{t+1}$**
Focused Update (1 if yes)	0.0003	0.0002	0.0013*	-0.0002
	(1.321)	(0.176)	(1.897)	(-0.129)
Less-Focused Update (1 if yes)	0.0006**	-0.0047**	0.0004*	-0.0040**
	(1.978)	(-2.049)	(1.888)	(-2.038)
Vague Update (1 if yes)	-0.0001	-0.0017	-0.0001	-0.0025
	(-0.784)	(-0.924)	(-0.343)	(-1.194)
Dispersion$_t$	1.0237***		0.6514***	
	(10.212)		(8.262)	
Error$_t$		0.2015***		0.2135***
		(3.341)		(3.489)
Loss	0.0006***	-0.0042*	0.0004*	-0.0047**
	(3.346)	(-1.868)	(1.930)	(-2.138)
Ln(Numest)	-0.0001	-0.0021*	-0.0002	-0.0016
	(-0.566)	(-1.952)	(-0.362)	(-1.333)
CAR[-1,1]	0.0006	0.0359***	-0.0001	0.0343***
	(0.493)	(3.861)	(-0.083)	(3.662)
Ln(Market Cap.)	0.0001	-0.0008	-0.0025***	-0.0010*
	(0.914)	(-1.559)	(-5.376)	(-1.745)
Beta	-0.0001	0.0013	-0.0003	0.0022
	(-0.318)	(0.970)	(-0.914)	(1.624)
Momentum	-0.0021***	0.0118***	-0.0012***	0.0134***
	(-5.732)	(7.184)	(-3.200)	(7.480)
Book-to-Market	0.0003	-0.0353***	-0.0002	-0.0329***
	(0.604)	(-9.869)	(-0.223)	(-9.778)
Ln(10-Q Length)	0.0003***	-0.0010	0.0004***	-0.0013*
	(4.392)	(-1.522)	(4.143)	(-1.799)
Ln(10-K Item 1A)	-0.0001	0.0004	0.0002	0.0003
	(-1.440)	(0.623)	(1.410)	(0.527)
Volatility	0.0919***	-0.6032***	0.0926***	-0.6516***
	(5.115)	(-5.668)	(4.584)	(-5.747)
R&D Indicator	-0.0004***	0.0015	0.0006	0.0015
	(-4.021)	(1.312)	(1.254)	(1.410)
Constant	-0.0047***	0.0388***	0.0136***	0.0426***
	(-3.371)	(4.539)	(4.705)	(4.399)
Observations	36,642	36,642	36,642	36,642
Adj. R^2	0.245	0.132	0.245	0.132

This table reports coefficient estimates from ordinary-least-squares regression estimation on the relation between future analyst forecast properties (*Dispersion$_{t+1}$* and *Error$_{t+1}$*), risk factor updates (*Update*), risk factor update focus (*Focused Update*, *Less-Focused Update*, and *Vague Update*), and a vector of control variables. All specifications include fixed effects for industry and year-quarter and compute standard errors clustered by firm. *t*-statistics are presented in parentheses. Variable definitions are provided in Appendix C. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.