The Effect of Managers' Risk Perceptions on Risk Factor Disclosures

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Abstract

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The SEC mandates that firms disclose material risk factors in their annual reports and adopts a principles-based approach, which allows managers to exercise discretion in determining which risks are material and the extent to which these risk factors are disclosed. To investigate whether risk factor disclosures reflect what managers consider to be material risks as the SEC intended, I examine manager-specific factors as a determinant of the content of risk factor disclosures. Specifically, I propose that managers have different risk perceptions that affect their assessment of material risks and ultimately the disclosure outcomes. Using a fixed effects approach, I find that individual managers have a significant effect on both the quantity and quality of risk factor disclosures after controlling for time varying firm characteristics, reporting incentives, firm fixed effects, and time fixed effects. Further, I examine managerial overconfidence, a managerial bias

that is related to how managers perceive risks, and find that more overconfident managers disclose fewer risk factors and provide lower quality risk factor disclosures. Finally, I find that firms with more overconfident managers are more likely to receive a SEC comment letter on their risk factor disclosures. Overall, my findings suggest that manager-specific factors have a significant influence on the textual content of an important mandatory disclosure.

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DEDICATION

To my parents, Taehoon Moon and Heakyung Lee,
for instilling in me the appreciation for life and love for learning,
for holding up with me every Sunday night via Facetime,
for their unconditional and unlimited belief in me that made everything possible
I have no clue where your love starts and ends

And of course, to my little brother, Keechan Moon
for reminding me now and then of how lucky I am to pursue what I love, like a big brother

"It's OK to have your eggs in one basket as long as you control what happens to that basket."
- *Elon Musk, CEO, Tesla*

1. Introduction

In 2005, the Securities and Exchange Commission (SEC) mandated that firms disclose *significant* risk factors in their annual reports on Form 10-K and update these disclosures quarterly on Form 10-Q.[1] The SEC adopted a principles-based approach to these disclosures – allowing managers "to evaluate the significance of information" and "to determine whether disclosure is necessary" – in order to encourage managers to disclose *firm-specific* information about *material* risk factors that "provides investors with important context for assessing the firm's financial potential" (SEC 2003). As a result, the content of risk factor disclosures is a function of not only a firm's inherent risk, but also a manager's *perception* of what is considered material risks, as well as other reporting incentives.

The flexibility granted to managers and the lack of a bright-line, quantitative threshold for determining "material risks" increases the likelihood that managers' risk perceptions will affect the content of risk factor disclosures. However, the SEC remains concerned about whether risk factor disclosure reflects a manager's material risk assessment of the firm (SEC 2016). While prior literature finds that the content of risk factor disclosures reflects firms' inherent risks and reporting incentives (Campbell et al., 2014; Hope et al., 2016; Gaulin, 2017; Beatty et al., 2019), it does not provide evidence on whether differences in managers' risk perceptions lead to different disclosure outcomes. In this study, I provide a more complete picture of what the mandatory risk factor

[1] The SEC requires that firms disclose "the most significant risk factors that make an investment in a registrant's securities speculative or risky" (SEC 2005, Regulation S-K, Item 503 (c)). While the SEC has been using "significant" and "material" interchangeably when describing risks that should be disclosed, most recently, on August 8, 2019, the SEC proposed amendments to the disclosure threshold standard from the 'most significant' factors to 'material' factors to refine the principles-based approach (i.e., an approach that articulates a disclosure objective and looks to management to exercise judgement in satisfying that objective) (SEC 2003). Information is considered *material* if "there is a substantial likelihood that a reasonable investor would consider the information important in deciding how to vote or make an investment decision" (SEC 2019).

disclosure captures by recognizing managers' discretion in determining material risks and their differential risk perceptions. Specifically, I examine the effect of manager-specific factors on the content of risk factor disclosures.

Prior studies that build on the upper echelon theory predict and find that the effect of a manager-specific style varies with the amount of discretion available to the manager (Hambrick, 2007; Ge et al., 2011). While the SEC grants a high level of managerial discretion with risk factor disclosures, it is possible that content included in mandatory disclosures such as 10-Ks are too carefully crafted and vetted by professionals (such as auditors and legal counsels) prior to release to allow managerial characteristics to impact the disclosures (Davis et al., 2015). In particular, if firms use risk factor disclosures to mitigate litigation risk, firms may choose to let their legal counsel craft and finalize the disclosures, leaving little room for senior management input.[2] Relatedly, the SEC has expressed concern that firms' risk factor disclosures often include generic risks to reduce potential litigation rather than disclosing what managers consider to be material as initially intended (SEC 2016). Recent studies also provide evidence in support of this concern (Beatty et al., 2019). Thus, whether manager-specific factors affect the content of risk factor disclosures is an empirical question that is not obvious ex-ante.

Using the methodology of Bertrand and Schoar (2003) that tracks CEOs across firms, I first examine whether *CEO style* (i.e., a CEO-specific fixed effect) explains the content of risk

[2] I conducted an informal interview with one Fortune 500 CFO who indicated that at his company the legal team initially drafts a list of risk factors that is later discussed by top executives, who ultimately decide on what the significant risks are to the firm. The legal team then finalizes the disclosure, and the CEO and CFO go over the annual report cover to cover. However, another informal interviewee who worked at a S&P 500 firm as a Senior Manager of Corporate Accounting indicated that at his company the accounting team initial drafts the risk factor disclosure and then provides it to the legal team for review. He mentioned that both the CEO and CFO are involved in determining the content of this disclosure, although the legal team takes on a leadership role.

factor disclosures.[3] I construct a sample of 118 CEOs who have worked a minimum of one year each for at least two firms between December 2005 and 2018 so that I can separate CEO-specific fixed effects from firm and time-specific effects. I use two measures to capture the content of risk factor disclosures: (1) the number of risk factors disclosed, and (2) an aggregate measure of the quality of the risk factor disclosure (i.e. the decision usefulness or informativeness to stakeholders).[4] Following prior studies, I measure the quality of risk factor disclosure based on three textual attributes of disclosure including verbosity, numerical intensity, and specificity (Campbell et al., 2014; Hope et al., 2016; Gaulin, 2017) and classify risk factor disclosures as being of lower quality when they are shorter, less specific, and contain less numerical discussion.

Consistent with CEOs' styles affecting risk factor disclosure, I find that CEO fixed effects exhibit joint significance in explaining both the number of risk factors disclosed and the quality of the disclosure. These findings suggest that CEO style is a statistically significant determinant of the content of risk factor disclosures incremental to firm and time-specific factors. Adding CEO fixed effects to a benchmark model increases the explanatory power of the model by 2.1% points for the number of risk factors and by 5.1% points for the quality of risk factor disclosure. These results are similar to the magnitude of the CEOs' effect on investment and financial policies reported in Bertrand and Schoar (2003). I also find notable variation in the individual CEO's fixed effect estimates; the interquartile range of CEO's fixed effect estimates for the number of risk factors reported is 1.99 which is comparable to the interquartile range of firm's fixed effect estimates of 1.55. The magnitude of this result indicates that CEO style has an economically

[3] I focus on chief executive officers' (CEOs') effect on risk factor disclosure as CEOs are the final decision makers on the firms' operation and investment projects, which are directly related to the firms' risks, and the ones who set the tone of what the current material risks are to the firm.

[4] In disclosing risk factors, the SEC requires firms to describe how each risk factor, summarized by a caption, affects the firm. Gaulin (2017) finds that managers convey information by adding and removing distinct risk factors, suggesting that managers treat each risk factor as a distinct signal. Therefore, I treat each risk factor as the unit of measure that contains a unique risk to which managers apply their material risk assessments (Gaulin, 2017).

significant impact on the content of risk factor disclosures. To provide assurance that the difference in the content of risk factor disclosures is attributable to CEOs' styles, I conduct an out of sample test and find that the estimated CEO style is significantly related to the unexplained portion of the out of sample risk factor disclosure content. Taken together, my findings are consistent with the hypothesis that CEOs' styles affect the content of risk factor disclosures.[5]

The evidence of a manager-specific effect on the content of risk factor disclosures is consistent with managers' risk perceptions influencing their assessment of material risks and, as a result, affecting the content of risk factor disclosures. To provide more direct evidence on the influence of *managers' risk perceptions* on risk factor disclosures, however, I next examine a characteristic that can capture variation in how managers perceive risks: CEO overconfidence.

CEO overconfidence is the tendency of managers to overestimate the firm's prospects and underestimate its risk (Skala, 2008). Specifically, prior research in psychology finds that overconfidence has four key facets (Moore and Healy, 2008; Skala, 2008): overconfident individuals 1) overestimate the precision of their beliefs and underestimate the uncertainty of outcomes (miscalibration), 2) overestimate the mean of uncertain outcomes (over-optimism), 3) believe they are more skillful than others (the better-than-average effect), and 4) believe they can control uncertain events outside of their influence (the illusion of control). These four facets of overconfidence likely influence CEOs' perceptions of defining material risks and thus, influence the *number* of risk factors disclosed. For example, the illusion of control suggests that

[5] While it is possible that boards select CEOs with certain styles to affect the firm's disclosure outcomes, I do not differentiate between a randomly selected CEO exerting his/her style on the content of risk factor disclosure and an intentionally selected CEO exerting his/her style on the disclosure because in either case, it suggests that CEO style affects the content of risk factor disclosures.

overconfident managers are likely to believe that they can control risk and thus do not perceive certain risks as material.[6]

Overconfidence also likely affects the *quality* of risk factor disclosure. Prior research suggests that overconfident managers underinvest in information production (Goel and Thakor, 2008), which would likely lead to lower quality risk disclosures. Moreover, managers tend to disclose more precise information as adverse events become more probable (Gaulin, 2017); however, because overconfident managers likely believe that negative events are under their ability and control (Ben-David et al., 2013), they are unlikely to increase the precision of their disclosures. Thus, I predict that more overconfident CEOs report *fewer* risk factors and provide *lower quality* information about risk factors than less overconfident CEOs.

It is important to note that if overconfident managers make risky business decisions (Malmendier and Tate, 2005; 2008; Hirshleifer et al., 2012; Ben-David et al., 2013) and thus make firms inherently riskier, this should translate into *more* risk factor disclosures. After controlling for differences in inherent risks and strategic reporting incentives across firms, the number of disclosed risk factors should not be different between firms if managers have homogeneous beliefs about what defines a material risk. However, due to cognitive biases of overconfident CEOs, I expect that firms with more overconfident CEOs will disclose fewer risk factors and provide lower quality disclosures about those risk factors than firms with less overconfident CEOs *after controlling for firm-level inherent risk and reporting incentives*.[7,8]

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[6] I discuss each facet and how it relates to risk factor disclosures in detail in Section 2.

[7] Throughout the paper, I presume that overconfident managers believe what they disclose (Fischer and Verrechia, 2004). Thus, the differences in risk factor disclosures are attributed to the differences in risk perceptions (after controlling for differences in inherent risks and reporting incentives). To address any concern related to strategic disclosure, I control for both firm level and manager level disclosure incentives related to strategic disclosure such as proprietary cost, litigation, and manager equity incentives.

[8] Note that I differentiate risk perception and risk preference. Risk perception is a person's perception of what constitutes a risky option whereas risk preference is the tendency to engage in behaviors that involve higher variance in returns (i.e., rewarding yet involve some potential for loss (Weber and Milliman, 1997)). While these two can be

I further adopt an ex-post summary measure of the content of risk factor disclosures: SEC comment letters. In 2010, the SEC warned firms to "avoid generic risk factor disclosures" and issued comment letters to firms with less specific or potentially incomplete risk factors. Building on the prediction that firms with more overconfident CEOs provide fewer risk factors and lower quality risk disclosures, I also predict that firms with more overconfident CEOs are more likely to receive SEC comment letters related to their risk factor disclosures in the subsequent year than firms with less overconfident CEOs.

Using a sample of 18,364 firm-year observations between 2005 and 2018 and a measure of overconfidence based on the option-holding behavior of CEOs (Malmendier and Tate, 2005; 2008; Campbell et al., 2011), I find that firms with more overconfident CEOs disclose fewer risk factors and provide lower quality disclosures about these risk factors than firms with less overconfident CEOs, consistent with my hypothesis. Furthermore, I find that firms with more overconfident managers are more likely to receive SEC comment letters on risk factor disclosure in the subsequent year. These results are robust to controlling for firms' inherent risk, strategic reporting incentives, and the inclusion of firm and year fixed effects. Additionally, these results further strengthen my prior inference that CEO-specific factors affect the content of risk factor disclosures despite the mandatory nature of the disclosure. In robustness tests, I document that the effect I attribute to CEO overconfidence is not subsumed by seven other observable characteristics of CEOs (i.e., founder, CPA, MBA, gender, age, CEO and chairman duality, recession experience).

correlated, risk preferences do not necessarily need to accompany bias in risk perception. A CEO can perceive a risk without bias and still prefer to take risks. In that case, the activity undertaken by the CEO's risk preference will be captured in the firm's inherent risk, and not the overconfidence measure that captures the bias in risk perception.

I conduct several additional analyses and my inferences are robust to a changes specification as well as to the inclusion of auditor fixed effects and a control for the existence of general counsel in the top management team.

My study contributes to two streams of literature. First, I complement the growing literature on risk factor disclosure by providing evidence that managers uniquely impact the content of these disclosures. While the content of risk factor disclosures is a function of a firm's inherent risk, a manager's perception of what is considered to be material risks, and reporting incentives, prior studies primarily focus on firm-level determinants and incentives of the disclosures.[9] I challenge the prior studies' maintained assumption that CEOs report risks homogeneously and provide evidence that managers' risk perceptions influence their assessment of material risks, thereby impacting the content of risk factor disclosures.

My study also adds to the literature examining the impact of managerial traits, especially overconfidence, on various firm decisions and outcomes.[10] By examining risk factor disclosures, I provide more direct evidence of overconfident CEOs' differential risk perceptions. My study suggests that risk factor disclosure can be another possible lens through which researchers and investors can observe the extent and impact of CEO overconfidence. Additionally, this is the first study to examine the relation between managerial overconfidence and the content of a mandatory qualitative disclosure. Finally, my findings that overconfident CEOs disclose fewer risk factors and provide lower quality disclosure highlight another cost of having an overconfident CEO, and

[9] See, for example, Kravet and Muslu (2013), Campbell et al. (2014), Bao and Datta (2014), Hope et al. (2016), Heinle and Smith (2017), Chiu et al. (2018), Chiu et al. (2019), and Beatty et al. (2019) for related literature.

[10] See, for example, Malmendier and Tate (2008) and Hirshleifer et al. (2012) for the effect of managerial overconfidence on various corporate decisions, Hribar and Yang (2016) for the effect of managerial overconfidence on voluntary disclosure decisions, and Schrand and Zechman (2012) and Ahmed and Duellman (2013) for the effect of managerial overconfidence on financial reporting quality.

thereby complement prior studies that examine the costs and benefits of having an overconfident CEO.[11]

Finally, my study has several implications for regulators, investors, and directors. First, my findings address the SEC's concern about whether risk factor disclosures reflect what managers truly consider to be material risks or simply relay boilerplate information about all known risks (SEC 2016). The fact that manager style, and specifically managerial overconfidence, affects risk factor disclosures is more consistent with the former than the latter. Secondly, my study provides input to the SEC's discussion on the tradeoffs of adopting the principles-based disclosure requirement that relies on managers' judgements to determine what is material and how to disclose such information (SEC 2019). The findings of this study suggest that without a standardized quantitative threshold to specify material risks or a requirement to disclose managers' assessments of material risks, CEOs' differential risk perceptions are more likely to influence the content of risk factor disclosures. While the current disclosure requirement may help convey managers' risk assessments to investors, it may also come at a cost of lower comparability and consistency in risk factor disclosure and inadequate information if managers "misjudge what information is material" (SEC 2019). Relatedly, I find that overconfident CEOs' undisclosed or poorly described risk factors are likely to result in negative consequences that are documented to adversely affect investors' wealth (i.e., receiving SEC comment letters that lead to negative market reactions) (Dechow et al., 2016; Brown et al., 2018). Given that prior research suggests that overconfident managers are prone to making risky choices, it is important to understand whether these risks are appropriately disclosed to investors and other stakeholders via mandated risk factor disclosures.

[11] On the one hand, prior studies find that overconfident managers undertake value destroying mergers (Malmendier and Tate, 2008), engage in aggressive earnings management (Schrand and Zechman, 2012), and increase stock price crash risk (Kim et al., 2016). On the other hand, prior studies find that overconfident managers enhance firm performance, increase innovation, and increase firm value (Galasso and Simcoe, 2011; Hirshleifer et al., 2012).

Thus, requiring managers to explain how each risk factor is material to investors or standardizing the materiality threshold (SEC 2016) could further improve risk factor disclosure.

2. Hypothesis development

Effective on December 1, 2005, the SEC began requiring most public firms to include a risk factor section in their Form 10-Ks and 10-Qs to disclose what they consider "the most significant factors that make the offering speculative or risky" (SEC 2005, Regulation S-K, Item 503 (c)) (See Appendix 1 for examples of risk factor disclosures).[12] The mandate was grounded in the belief that providing "investors with a clear and concise summary of the material risks" would be "beneficial to investors" (SEC, 2005). In establishing the risk factor disclosure requirement, the SEC took a principles-based approach, allowing managers discretion in evaluating what risks they deem material to their firms and how to describe those risks. Accordingly, the content of risk factor disclosures is a function of a firm's inherent risk, reporting incentives, and a manager's perception of material risks (i.e., a function of a manager's assessment of risk and the manager's perception of what is considered material).

Consistent with the SEC's intention, a growing literature finds evidence that risk factor disclosures reflect information about firm-specific risks that in turn affects stakeholders' assessments of firm risk and value. Campbell et al. (2014) find that pre-disclosure measures of firm risk (e.g., market beta) are positively associated with firms' disclosed risks. Hope et al. (2016) find that while investors and analysts benefit from more specific risk factor disclosures, firms with high proprietary costs provide less specific disclosures. Consistent with the incentive to reduce the expected cost of class action securities litigation, Gaulin (2017) and Nelson and Pritchard (2016)

[12] The SEC requires firms to update the Item 1A risk factor section in their Form 10-Qs as necessary to reflect material changes from previously disclosed risks. In addition, asset-backed issuers are excluded from the mandate. Small business issuers (firms with total assets of $5 million or less) have an option to adopt the reduced disclosure requirements on an item-by-item basis or forgo Item 1A risk factor disclosures.

find that firms with high litigation risk disclose more risk factors and disclose more specific, readable, and detailed risk factors.

Collectively, these studies assume that managers have homogeneous beliefs about what defines a material risk and thus attribute differences in the content of risk factor disclosures to differences in firm-specific risks and reporting incentives. However, because the SEC allows managers discretion in determining the risk factors they consider *material* to their firms, it is expected that managers' idiosyncratic *beliefs* about the probability of specific adverse outcomes or the anticipated cost of those outcomes to influence firms' risk factor disclosures. In particular, the upper echelons theory views an organization's top managers as dominant factors in shaping organizational outcomes and predicts that firm outcomes are "reflections of the values and cognitive bases of powerful actors" (Hambrick and Mason, 1984). In support of the upper echelon theory, Bertrand and Schoar (2003) find that managers have an effect on investment, financial, and organizational strategies incremental to firm-specific characteristics, which they refer to as "manager style". Adopting the approach of Bertrand and Schoar (2003), several studies find that manager style affects firms' accounting choices (Ge et al., 2011), tax avoidance (Dyreng et al., 2010), and voluntary disclosure policies, such as forecasting choices (Bamber et al., 2010) and the tone of earnings conference calls (Davis et al., 2015). Overall, these studies provide evidence that different manager styles, which are formed through different dispositional factors or experiences, lead managers to make different choices.

Importantly, the upper echelon theory predicts that managers' characteristics can increasingly impact their decisions when managers can exercise greater discretion (Hambrick, 2007). Given that risk factor disclosures afford managers a high level of discretion not only in identifying risks they deem relevant to their firms, but also in assessing the likelihood and costs of

those risks and determining the materiality of those risks, it is likely that managers' styles affect these disclosures. Moreover, managers are not required to disclose any estimated likelihood of a disclosed risk factor's occurrence or quantify the impact of a disclosed risk (Campbell et al., 2014). When managers do not have to provide detailed quantitative information, it is more likely that information disclosed reflects more of the subjective beliefs of managers. Thus, risk factor disclosure provides a setting that is susceptible to managerial style.[13] Accordingly, I expect manager-specific factors to affect the content of the risk factor disclosure incremental to a firm's characteristics and reporting incentives. My first hypothesis (in alternative form) is as follows:

Hypothesis 1. CEOs' styles affect the content of risk factor disclosures, ceteris paribus.

To capture the content of risk factor disclosures, I examine both the quantity (the number of risk factors disclosed) and the quality (textual attributes) of risk factor disclosure. The number of risk factors disclosed provides an opportunity to identify CEOs' differential perceptions of material risks. However, it does not necessarily indicate that managers' differential perceptions of material risks affect the *quality* of their risk factor disclosures (i.e. the decision usefulness or informativeness to stakeholders). It is possible that CEOs provide a long list of risk factors that are not informative to users or provide a short list of risk factors that are more informative to users. Therefore, I consider both the *number* of risk factors and the *quality* of risk disclosures.

[13] Another section in the annual report (Form 10-K) that provides information about risk is Item 7A "Quantitative and Qualitative Disclosure about Market Risk." The SEC mandates that firms disclose quantitative and qualitative information about known exposures to market risk factors (e.g., interest rate risk, foreign currency rate risk, and commodity price risk) related to market risk sensitive instruments in Item 7A (SEC 1997, Regulation S-K, Item 305, FRR No. 48). Item 1A Risk factor disclosure is different from Item 7A in that managers do not have to *quantify* the impact that disclosed risk will have on the financial statements in Item 1A whereas provision of quantitative information is required in Item 7A. Moreover, risk factor disclosure "should not present risks that could apply to any firm" (17 CFR 229. 503 (c)). Some firms provide risk disclosure in the Management Discussions and Analysis (MD&A) section. However, this is not the focus of my study where I aim to examine managerial style as a determinant of the content of *mandatory* disclosure.

While evidence of a manager-specific effect on risk factors disclosures is consistent with managers' differential *risk perceptions* affecting their assessments of materials risks, I investigate this effect more directly by examining how managerial overconfidence – a managerial bias that reflects how managers perceive risks – affects the content of risk factor disclosures. In the finance and accounting literature, an overconfident manager refers to a manager who overestimates the future prospects (i.e., returns or cash flows) of the firm and underestimates its risks. Based on the presumption that overconfident managers perceive risks differently, prior literature finds that overconfident managers make risky business decisions and reporting choices, such as undertaking value destroying mergers (Malmendier and Tate, 2008), choosing aggressive investments (Malmendier and Tate, 2005; Hirshleifer et al., 2012; Ben-David et al., 2013), providing narrower range forecasts (Hribar and Yang, 2016), engaging in aggressive earnings management (Schrand and Zechman, 2012), and reporting less conservative accounting (Ahmed and Duellman, 2013).

These findings are grounded in the psychology literature which defines overconfidence in terms of four facets: miscalibration, over-optimism, the better-than-average effect, and the illusion of control (Skala, 2008; Moore and Healy, 2008).[14] Each of the four facets suggests that overconfident managers will have different perceptions of what are considered material risks that would in turn affect the content of the firm's risk factor disclosures.

First, miscalibration is defined as excessive confidence in the accuracy of one's beliefs (Oskamp, 1965; Moore and Healy, 2008). Because miscalibrated people overestimate the precision

[14] Moore and Healy (2008) examine the relation between overprecision (miscalibration), overestimation (over-optimism), and overplacement (the better-than-average effect) and find evidence suggesting that the different types of overconfidence are interrelated yet conceptually distinct. This explains why prior studies have defined overconfidence in terms of the four facets. In this study, I incorporate all four facets of overconfidence in forming my predictions since each facet is likely to be important in the context of risk factor disclosure where managers determine what risks are material and the extent to which they will disclose relevant information for each factor. However, the empirical measure of overconfidence that I adopt in this study does not distinguish each facet of overconfidence. Therefore, I assume that the empirical measure captures some of each facet following Hribar and Yang (2016).

of their own beliefs and thus underestimate the variance of uncertain events, they hold overly narrow subjective probability distributions. Using a survey, Ben-David et al. (2013) find evidence that top managers are severely miscalibrated. When top managers are asked to forecast stock returns and estimate confidence intervals, they set confidence intervals too narrowly relative to the historical variance. As a result, they find that the realized market returns are within the managers' 80% confidence intervals only 36% of the time. Similarly, Hribar and Yang (2016) find that overconfident managers are more likely to issue narrower range forecasts that they subsequently miss. If more overconfident CEOs underestimate the riskiness of investment projects and, as a result, perceive the risk as immaterial, they are likely to provide fewer risk factors than less overconfident CEOs.

Second, over-optimism refers to an unrealistic optimism about uncertain outcomes (Taylor and Brown, 1988). For example, Hribar and Yang (2016) find that overconfident managers' forecasts have a greater optimistic bias. Because over-optimistic people overestimate the mean of uncertain outcomes, overconfident managers who overestimate the level of future cash flows from risky investment projects (Hirshleifer et al., 2012) misperceive negative net present value (NPV) projects as value creating and keep these projects until the asset price crashes (Kim et al., 2016). Over-optimism is likely to lead more overconfident CEOs to underestimate the downside risk related to risky investments and, as a result, disclose fewer risk factors than less overconfident CEOs because the risk factor disclosures tend to focus on downside risk.

Third, the better-than-average effect refers to judging one's acumen higher relative to others without prior knowledge of others' attributes (Svenson, 1981). For example, Malmendier and Tate (2008) find that overconfident CEOs over-estimate their ability to generate returns both in their firm and by taking over other firms and, as a result, they are more likely to make

acquisitions. The better-than-average effect suggests that overconfident managers consider themselves to be better at controlling risks *relative to* their peers. Risk factor disclosure, by definition, should identify risk factors that make the firm *relatively riskier* than other firms (17 CFR 229. 503). With this effect, overconfident CEOs are likely to perceive a risk that is material to their peers as immaterial to themselves, leading them to identify fewer risk factors compared to peers with similar inherent risks.

Finally, the illusion of control refers to one's belief that they can control uncertain events over which they actually have limited influence while underestimating the scope of the event (Langer, 1975; Taylor and Brown, 1998; Kahneman and Lovallo, 1993). For example, Schrand and Zechman (2012) argue and find that overconfident managers are more likely to manage earnings by borrowing from the future because they believe the future performance will improve enough to cover the past misstatement (over-optimism) and the misstatement will go undetected (the illusion of control). While prior studies find that managers acquire and disclose more risk information when they receive negative information about their future prospects (i.e., their cash flow risk becomes greater than expected) (Heinle and Smith, 2017; Campbell et al., 2014; Hope et al., 2016), the illusion of control facet suggests that overconfident CEOs are more likely to believe they can control the future and less likely to revise their expectations based on negative information. As a result, more overconfident CEOs are more likely to consider certain risks as immaterial and thus disclose fewer risk factors compared to less overconfident CEOs.

Based on the predictions derived from the four facets of overconfidence, I expect that overconfident CEOs will affect the content of risk factor disclosures by disclosing fewer risk factors in their firms' mandatory reports, after controlling for inherent firm risk and reporting incentives. Thus, my second hypothesis (in alternative form) is as follows:

Hypothesis 2a: More overconfident CEOs provide fewer risk factors in their firms' risk factor disclosures compared to less overconfident CEOs, ceteris paribus.

How would CEO overconfidence affect the quality of risk factor disclosure? Gaulin (2017) finds that managers disclose more precise information as adverse events become more probable. Goel and Thakor (2008) show that because overconfident managers overestimate the precision of their beliefs, they underinvest in information production and thereby provide less precise information to investors. Since overconfident managers tend to believe that negative events are less likely to happen under their ability and control (Ben-David et al., 2013), they are less likely to invest in information production and to explain risk factors in detail compared to less overconfident managers. Thus, I predict that the extent to which CEOs describe each risk factor will differ based on the CEO's level of overconfidence. This leads to my last hypothesis (in alternative form) as follows:

Hypothesis 2b: More overconfident CEOs provide lower quality risk factor disclosures compared to less overconfident CEOs, ceteris paribus.

It is possible, however, that CEOs' styles will not affect risk factor disclosure. If annual reports are largely crafted and vetted through professionals (e.g., legal team members, accounting team members, and auditors) before becoming publicly available, there may be little room for CEOs to influence the disclosure (Davis et al., 2015). This prediction would be consistent with the SEC's concern that firms are overloading investors with all possible risk factors rather than disclosing what they consider to be material risks.

It is also possible that CEO overconfidence will not affect the content of risk factor disclosures if external monitoring forces foresee such adverse effects on the quality of the disclosure. However, while theoretical work suggests that the adverse effects of managerial

overconfidence can be constrained by strong external monitoring (Kahneman and Lovallo, 1993; Heaton, 2002), empirical evidence provides mixed results on the external monitoring role in deterring overconfidence biases (Schrand and Zechman, 2012; Ahmed and Duellman, 2013; Banerjee et al., 2015). Thus, it is an empirical question whether CEO overconfidence affects the content of risk factor disclosures.

3. Sample construction and measurement of key variables

3.1. Sample construction

In this study, I construct two different samples to test my hypotheses. I next describe each of my sample construction procedures.

First, in order to examine the effect of CEOs' styles on the content of risk factors disclosures (Hypothesis 1), I follow the methodology of Bertrand and Schoar (2003) and construct a CEO-firm matched panel dataset that tracks CEOs across firms over time. This approach allows me to estimate both CEO fixed effects and firm fixed effects and thus separate the effect of CEO-specific factors on risk factor disclosures from that of firm-specific factors.[15]

Table 1 Panel A summarizes my sample construction procedure. Using Execucomp data from 2005 to 2018, I track the names of the CEOs in 1,500 publicly traded U.S. firms. I identify 166 CEOs who have worked for at least two firms. To ensure that a CEO had a chance to impose his/her style on risk factor disclosures, I require CEOs to have worked at each firm for at least one

[15] An alternative method to separately estimate firm and manager effects is the Abowd, Kramarz, and Margolis (AKM) method proposed by Abowd et al. (1999). While the Bertrand and Schoar (2003) methodology focuses on managers who have changed firms (i.e., movers) and thus leads to relatively small sample sizes, the AKM methodology utilizes movers to deduce information about the nonmovers who work in firms that have hired at least one mover and thus increases sample sizes and power (Graham et al., 2012). In the case of limited mobility, however, the AKM methodology may result in biased estimators of firm and manager fixed effects and may overstate the contribution of manager fixed effects (Cho et al., 2016). Thus, the Bertrand and Schoar (2003) methodology is more appropriate in my study where the nature of the sample (i.e. sample of CEOs) limits the number of movers within a given firm (Cho et al., 2016).

year.[16] In order to separate the CEO effect from the firm effect, I also require firms in my sample to have at least two CEOs. Thus, for the firms that appear under only one CEO, I include firm-year data for the same firm in three years prior to the starting year of the CEO and three years following the final year of the CEO at the firm. These firm-years are called "filler years" and I require data to be available for at least two filler years (Ge et al., 2011).

I extract the 10-K filings from the SEC's Electronic Data Gathering and Retrieval (EDGAR) database following the methodology described in Campbell et al. (2014) and Gaulin (2017). I obtain accounting data from Compustat, stock return data from the Center for Research in Security Prices (CRSP) database, risk factor disclosure-related SEC comment letters from the Audit Analytics Comment Letter database, securities litigation events from the Stanford Law School's Securities Class Action Clearinghouse, and analyst data from I/B/E/S. I further require that firms have at least 240 daily returns available prior to the 10-K filing date. After removing firm-years with missing data and CEOs with data only available for one firm, my main CEO-firm matched sample results in 834 firm-year observations representing 118 CEOs from 228 firms.

Table 1 Panel B reports the distribution of distinct CEO-firm pairs based on the number of years the CEO worked at each firm in my CEO-firm matched sample. The statistics show that CEOs worked with a given firm for at least 3 years for about 60% of my sample CEO-firm pairs, suggesting that, on average, my sample CEOs had a reasonable amount of time to impose their style on risk factor disclosures. Panel C tabulates the frequency of firms based on the number of distinct CEOs in my sample. Of the 228 distinct firms in my sample, 219 firms (96%) have only one CEO in my CEO-firm matched sample and are subject to filler year observations in order to separate the CEO fixed effects from the firm fixed effects. In my final sample, 542 filler year

[16] To ensure that a CEO worked in a firm for an entire year, I supplement Execucomp data with BoardEx data to identify the starting date and the ending date of the CEO role.

observations are added to my CEO-firm matched sample for the analyses. Panel D presents the frequency of CEOs based on the number of firms they worked for in my sample. I require CEOs to have worked at two firms at least and only one of them has been at three firms in my sample.

Next, in order to examine the effect of CEO overconfidence on the content of risk factor disclosures (Hypothesis 2), I construct a CEO-firm level panel dataset. This second sample allows me to examine a manager-specific effect on risk factor disclosures using a more general and larger sample compared to the first CEO-firm matched sample that requires CEOs to change firms. I collect sample firms from the Compustat database with fiscal year ends between December 2005 and December 2018 and identify CEOs who hold options using the ExecuComp database.[17] Based on this sample, I extract the 10-K filings from the SEC's EDGAR database. All data sources are identical as in the prior sample. After removing firm-years with missing data on variables, my main CEO-firm level sample consists of 18,364 firm-year observations representing 3,826 CEOs from 2,320 firms. Table 1 Panel E summarizes this sample selection procedure.

3.2. Measures of risk factor disclosure

I examine two features of the content of risk factor disclosures. First, I use the count of the total number of risk factors under Item 1A of the annual report for each firm (*NUM_RF*) in the natural logarithm form (*lnNUMRF*). The SEC requires that each risk factor should have a heading that summarizes that risk which is highlighted in bold, italic, or underlined (SEC 2005, Regulation S-K, Item 503 (c)). Therefore, I count the number of headings. Next, I create a composite measure of risk factor disclosure quality to capture the decision usefulness of the disclosure to stakeholders. The measure is based on three textual attributes of the disclosure because no single attribute can

[17] My measure of overconfidence, described in Section 3.3., is based on CEOs' option holding behavior. In order to avoid classifying a CEO who did not have an opportunity to hold a stock option as less overconfident, I restrict my sample to CEOs who were granted stock options.

capture all aspects of disclosure quality (Dyer et al., 2017). The first component of the measure is the verbosity of each risk factor measured by the average number of words used in each risk factor (*AVE_NUM_WORDS*) (Li, 2006; Kravet and Muslu, 2013; Campbell et al., 2014; Gaulin, 2017). Stop words such as 'the' and 'and' are excluded from the counting, using the default list of English stop words from the NLTK Python library (Gaulin, 2017). The second component of the measure is the numerical intensity of the risk factor disclosure measured by the portion of non-date numbers in the risk factor disclosure (*NUM_NUMERIC*) (Hope et al., 2016; Gaulin, 2017). The third component of the measure is the specificity of the risk factor disclosure measured by the portion of proper nouns in the risk factor disclosure (*NUM_SPECIFIC*) (Hope et al., 2016; Gaulin, 2017). I use the Stanford Named Entity Recognition (NER) algorithm to extract proper nouns with an intention of capturing whether the disclosure uses general language or specific language (e.g., our major customer vs. Microsoft).[18] I classify risk factor disclosures as being lower quality when they are shorter, less specific, and contain less numerical discussion.

To capture the overall quality of risk factor disclosures across different textual attributes, I obtain the tercile ranks of each of the three components by year and calculate the average rank (*RFQUALITY*).[19] For further analyses, I classify firms as being high (low) quality risk factor disclosers, *RFQ_HIGH* (*RFQ_LOW*) , if they are in the top (bottom) tercile for all three disclosure quality measures.

[18] The Stanford Named Entity Recognition (NER) algorithm offers seven entity categories from the pre-trained classifier, that is (1) location, (2) person, (3) organization, (4) money, (5) percent, (6) date, and (7) time. I only include the location, person, and organization to measure *NUM_SPECIFIC* to avoid overlapping with the numeric intensity proxy (*NUM_NUMERIC*).

[19] Campbell et al. (2014) develop a list of key words by identifying risk-related words in firms' risk factor disclosures using the Latent Dirichlet Allocation approach (Blei et al., 2003). I do not include the frequency of risk-related words in my composite quality measure because the list of key words is developed to correlate the content of risk factor disclosures with the firm characteristic and it is unclear whether presenting more risk words necessarily represents higher quality disclosures after controlling for firms' inherent risk.

Another way to examine the content of risk factor disclosure is by using SEC comment letters on risk factor disclosures as an ex-post measure. In 2010, the SEC made risk factor disclosure a focus of its corporate filing review and warned firms to "avoid generic risk factor disclosures that could apply to any company" (SEC 2010). Accordingly, firms with less specific or potentially incomplete disclosures of significant risk factors have received comment letters from the SEC, which when disclosed to investors have led to negative stock market reactions (Brown et al., 2018) (See Appendix 2 for examples of SEC comment letters on risk factor disclosures). Prior studies further find that firms improve the quality of their risk factor disclosures in terms of textual attributes after they, or their industry peers, receive a SEC comment letter (Gaulin, 2017; Brown et al., 2018). If overconfident managers provide lower quality information to stakeholders (Goel and Thakor, 2008), firms with overconfident CEOs are more likely to become subject to disproportionate regulatory scrutiny which results in receiving more comment letters related to risk factor disclosures. Therefore, I use an indicator variable that captures whether a firm receives an SEC comment letter that references risk factors in the subsequent fiscal year (*CL_RF*).

Figure 1 illustrates the time trend of my risk factor disclosure measures between the years 2005 and 2018. Overall, the total number of risk factors has been increasing while the numeric intensity and specificity of risk factor disclosure have been steadily decreasing.

Table 2 Panel A reports summary statistics for measures of risk factor disclosure. The statistics for the two samples I use are similar, so I focus on discussing the statistics for the larger and more general sample used for testing CEO overconfidence. On average, firms disclose 26 risk factors and roughly 12% (5,682/45,672) of the total words in the 10-K filings are attributable to risk factor disclosures. Firms use 217 words to describe each risk factor and use three specific

words per 100 words in the risk factor disclosure on average.[20] Ten percent (5%) of the CEO-firm years in my sample are classified as high (low) quality discloser based on the textual attributes of risk factor disclosures and 5% of the sample receives SEC comment letters related to risk factor disclosures. Panel B displays the correlation matrix of the textual variables. *NUM_SPECIFIC* is positively correlated with *AVE_NUM_WORDS* and *NUM_NUMERIC* and negatively correlated with *NUM_RF*, suggesting that my composite measure of disclosure quality and the number of risk factors are capturing different dimensions of the content of risk factor disclosures.

3.3. Measure of overconfidence

I operationalize CEO overconfidence using an option-exercise based measure of overconfidence developed by Malmendier and Tate (2005) and modified by Campbell et al. (2011). This measure identifies overconfident CEOs as ones who hold onto their fully vested stock options after the firm's stock price rises by at least 100%.[21] Using the timing of exercising managerial stock options to measure overconfidence is premised on the idea that CEOs who choose not to diversify their wealth after their firms experience a strong stock price increase are overconfident in their ability to keep the share price rising. In my tests, I classify CEOs as overconfident (*Overconfidence*) if they hold stock options that are 100% in the money at least twice during the sample period, starting from the second time they display such behavior.

4. The effect of CEO style on risk factor disclosure

[20] When I include all seven categories for specificity, the frequency of specific words is 0.05 (untabulated) which is similar to Hope et al., (2016) who report an average of 0.05 of specificity of risk factor disclosure based on the seven categories.

[21] Malmendier and Tate (2005) use proprietary data and apply a 67% moneyness cutoff to identify overconfident managers. Campbell et al. (2011) additionally adopt a 100% moneyness cutoff because 1) they use ExecuComp to gather option holding data which is not as detailed as the proprietary data in Malmendier and Tate (2005) so using a higher threshold reduces the likelihood of incorrectly identifying managers as being overconfident and 2) they argue that it is the CEOs with relatively high levels of overconfidence who are likely to drive the harmful effects of overconfidence. Since my study examines whether overconfident CEOs have different risk perceptions that lead them to provide lower quality risk factor disclosures, I follow Campbell et al. (2011) and use the 100% moneyness cutoff.

4.1. Research design

To test whether CEO style affects the content of risk factor disclosures (Hypothesis 1), I estimate the following Model (1) using OLS and regress each risk factor disclosure variable on a set of CEO, firm, and year indicator variables as well as time-varying control variables.

$$\begin{aligned} RiskFactorDisclosure_{i,t} &= \beta_1 + \beta_2 SIZE_{i,t} + \beta_3 F\_AGE_{i,t} + \beta_4 RET_{i,t} + \beta_5 STDRET_{i,t} + \beta_6 SKEWRET \\ &+ \beta_7 SH\_TURNOVER_{i,t} + \beta_8 BETA_{i,t} + \beta_9 LEV_{i,t} + \beta_{10} BIG4_{i,t} + \beta_{11} ETR_{i,t} \\ &+ \beta_{12} LOSS_{i,t} + \beta_{13} SALES\_GROWTH_{i,t} + \beta_{14} BTM_{i,t} + \beta_{15} lnANALYSTS_{i,t} \\ &+ \beta_{16} CL\_IND_{i,t} + \beta_{17} LITIGATION_{i,t} + \beta_{18} PROPRIETARY_{i,t} \\ &+ \beta_{19} lnHOLDING_{i,t} + FIRM_i + YEAR_t + CEO_j + \varepsilon_{i,t} \quad (1) \end{aligned}$$

The dependent variable, *RiskFactorDisclosure,* is either *lnNUMRF* or *RFQUALITY.* To examine Hypothesis 1, I perform an F-test to examine whether CEO-specific fixed effects on risk factor disclosures are jointly different from zero. To ensure that CEO-specific style affects the risk factor disclosure incremental to the firm's underlying risk and other incentives, I control for other determinants of risk factor disclosure content identified by prior literature. Detailed variable definitions are provided in Appendix 3.

Prior studies find that older, more established, and less volatile firms disclose fewer risk factors and use fewer words in the disclosure, consistent with larger firms being more stable and thus having lower risk (Campbell et al., 2014; Gaulin 2017). Thus, I control for firm size (*SIZE*), firm age (*F_AGE*), stock return (*RET*), stock return volatility (*STDRET*), stock return skewness (*SKEWRET*), and share turnover (*SH_TURNOVER*). I expect the coefficients on stock return volatility (*STDRET*) and share turnover (*SH_TURNOVER*) to be positive and the other coefficients to be negative. I also include the market beta (*BETA*) to control for firm risk and expect the coefficient to be positive.

Firms with higher levels of debt have higher default risk and therefore provide more risk factor disclosures (Campbell et al., 2014; Gaulin, 2017). Therefore, I control for firm leverage

(*LEV*) and expect the coefficient to be positive. Firms with a Big 4 auditor are associated with significantly more risk factor disclosures, presumably due to the higher litigation risk that big auditors face (Campbell et al., 2014; Nelson and Pritchard, 2016). Thus, I control for Big 4 auditors (*BIG4*) and expect the coefficient to be positive. Campbell et al. (2014) find that firms that engage in greater tax avoidance are more likely to provide more risk factor disclosures presumably because they face greater audit risk from the Internal Revenue Service. Therefore, I control for the effective tax rate (*ETR*) and expect the coefficient to be negative.

Heinle and Smith (2017) show that managers are more likely to gather and provide information when a firm is facing greater uncertainty. Thus, I control for losses (*LOSS*), book-to-market (*BTM*), and sales growth (*SALES_GROWTH*) to account for firm prospects that are associated with firm risk and expect the coefficients to be positive.[22]

Prior studies also find that disclosure demand is positively related to risk factor disclosure (Campbell et al., 2014; Gaulin, 2017; Brown et al., 2018). Therefore, I control for analyst following (*ANALYST*) and the total number of comment letters that industry peers received during the fiscal year (*CL_IND*) and expect the coefficients to be positive.

To control for reporting incentives related to reducing expected cost of litigation, I control for the existence of securities litigation events (*LITIGATION*). Prior studies find that firms with high litigation risk disclose more risk factors and provide more specific risk factors disclosures (Nelson and Pritchard, 2016; Gaulin, 2017), thus I expect the coefficient to be positive.[23] Risk

[22] I do not control for managerial ability because the most often used empirical measure of managerial ability (based on Demerjian et al., 2012) is intended to capture a manager's efficiency in generating revenues for a given level of resources; however, the measure is estimated at the firm level and not the individual manager level. As a result, this aspect of managerial ability should be captured by the firm-level controls used to capture a firm's inherent risk, such as performance.

[23] I do not include a measure of litigation risk (the probability of litigation) in my analyses because prior studies that model litigation risk (Rogers and Stocken, 2005; Kim and Skinner, 2012) use industry classification, size, sales growth, beta, return volatility, return skewness, and share turnover as determinants which I already include in my specification.

factor disclosures can also include proprietary information which firms tend to withhold due to competition (Dye, 1985; Hope et al., 2016). I control for proprietary information using R&D intensity (*PROPRIETARY*) and expect a negative coefficient.

One concern with examining the effect of CEOs' styles on risk factor disclosures is that there may be economic incentives that influence disclosures. Benmelech et al. (2010) argue that equity incentives induce managers to conceal bad news about the firm. Since investors incorporate information from risk factor disclosures into firms' stock prices (Campbell et al., 2014; Heinle and Smith, 2017), managers might want to disclose fewer risk factors to increase their firms' stock prices. Thus, I control for the natural logarithm of total options and stock holdings (*lnHOLDING*) and expect the coefficient to be negative.

I include firm fixed effects to control for unidentified time-invariant firm characteristics, allowing me to empirically separate firm-specific effects from CEO-specific effects. Year fixed effects are also included to control for macroeconomic factors affecting the content of risk factor disclosures. All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the effect of outliers.

4.2. Empirical results

4.2.1. Descriptive statistics

Table 3 Panel A reports summary statistics for the variables used in the analyses and Panel B displays the Pearson and Spearman correlation between the variables (below and above the diagonal, respectively). Consistent with prior research, the negative correlation between firm age (*F_AGE*) and the number of risk factors (*lnNUMRF*) suggests that older firms that are presumably more stable have fewer risk factor disclosures. The positive correlation between the total amount of options and stock holdings (l*nHOLDING*) and both the number of risk factors (*lnNUMRF*) and

the quality of the risk factor disclosure (*RFQUALITY*) suggests that CEOs' economic incentives do not necessarily lead them to provide fewer or lower quality risk factor disclosures.

4.2.2. Main results of Hypothesis 1: The effect of CEO style on risk factor disclosures

Table 4 Panel A presents the results of estimating Model (1). Columns (1) and (2) (Columns (3) and (4)) present results examining the effect of CEOs' styles on the number (quality) of risk factors, *lnNUMRF* (*RFQUALITY*). To provide a benchmark to compare the CEO fixed effect model, I first report the results of estimating Model (1) excluding the CEO fixed effect (Columns (1) and (3)) for each dependent variable.

The F-tests of the CEO fixed effects are highly significant for both the number of risk factors (*lnNUMRF*) and the quality of the content (*RFQUALITY*) of risk factor disclosures (both p values < 0.001). This indicates that CEO-specific fixed effects on risk factor disclosures are jointly different from zero after controlling for firm and time-specific fixed effects as well as time-varying firm characteristics, suggesting that CEOs' styles affect the content of risk factor disclosures.

To ensure that the F-test results are not driven by a small number of CEO effects, I report the percentage of significant CEO fixed effect estimates in Panel B of Table 4. At the 5% (10%) level, 16.53% (21.61%) of CEO fixed effects are significant across the risk factor disclosure measures on average, much larger than what is expected under the null hypothesis of no CEO fixed effect.[24] Also, it is larger than the average percentage of significant manager fixed effects (9% at the 5% significance level) reported in Ge et al. (2011). Taken together, the results are consistent with Hypothesis 1 that CEOs' styles affect the content of risk factor disclosures.

[24] The averages of significant CEO fixed effects across the risk factor disclosure measures (*lnNUMRF_coeff*, *RFQUALITY_coeff*) at the 5% and 10% levels are obtained by calculating (18.64%+14.41%)/2 and (27.97%+15.25%)/2, respectively.

To assess the economic significance of the CEO-specific effects on risk factor disclosure, I first examine the increase in the explanatory power from adding the CEO fixed effects to the benchmark model. When I add CEO fixed effects to the benchmark model, the adjusted R^2 increases by 2.1% points (from 85.3% to 87.4%) for the number of risk factors and by 5.1% points (from 56.6% to 61.7%) for the quality of the risk factor disclosure. These increases are comparable to the 1.92% average increase reported in Ge et al. (2011) that examine the CFO-specific effect on various accounting choices (i.e., discretionary accruals, use of operating lease, pension rate assumptions, F-score, small meet or beat of analysts' forecasts). It should be noted that the increases are smaller than the average increase reported in studies that examine the manager-specific effects on voluntary disclosures such as earnings conference calls (Davis et al., 2015) and management forecasts (Bamber et al., 2010).[25] This difference is most likely due to the mandatory nature of the risk factor disclosure that leaves less room for CEOs to impose their style on the content of the disclosures. However, regardless of the concern that firms' general counsels are primarily responsible for crafting the risk factor disclosure, I find evidence that CEOs' styles are reflected in the content of risk factor disclosures.

Next, I assess the economic significance of the CEO-specific effects by examining the distribution of the CEO's fixed effects estimates. As reported in Panel C of Table 4, there is notable variation in the individual CEO's fixed effect estimates. The interquartile range for *lnNUMRF* of CEO's fixed effects is 1.99.[26] In untabulated results, I find that the interquartile range for

[25] Davis et al. (2015) examine the manager (CEO or CFO) specific effects on the tone of earnings conference call and report that adding manager fixed effects to the models increases adjusted R^2 by 6.7% points on average. Bamber et al. (2010) find that adding CEO-specific effects to the model of management forecast precision increases adjusted R^2 by 6.5% points.

[26] I follow Bertrand and Schoar (2003) and weight each fixed effect estimate by the inverse of its standard error to account for estimation error. The interquartile range of CEO's fixed effect estimates for the untransformed value of *lnNUMRF* (*NUM_RF*) is 2.3. This indicates that the difference between a CEO at the top quartile of the distribution of the number of risk factors and one at the bottom quartile is around two risk factors.

lnNUMRF of firm's fixed effects is 1.55. This result suggests that the CEO-specific effects on risk factor disclosures are considerable relative to firm-specific effects.[27] Overall, I find evidence that CEO style has a statistically and economically significant impact on the content of risk factor disclosures.

4.2.3. Robustness tests

I conduct a robustness test to address the concern raised in Fee et al. (2013) that the results from the CEO fixed effects test are driven by the similarities between the firms that a CEO works at rather than capturing the active influence of the CEO.

I examine the relation between CEO fixed effects and out of sample residuals of risk factor disclosure based on an approach from Davis et al. (2015). For each CEO, I estimate the CEO's fixed effect by excluding one year's observation of a CEO (t) using Model (1). I repeat this process for each year for a given CEO and weight the fixed effects by the inverse of its standard error following Bertrand and Schoar (2003). Next, for each excluded firm year t, I obtain residuals from estimating the base model of risk factor disclosure (Model (1)), excluding the manager fixed effect. I then regress the out of sample residuals of CEO-firm year (t) on the corresponding estimated CEO's fixed effect obtained by excluding that year's observations (t). A significant coefficient implies that the estimated CEO fixed effect (excluding observation t) is related to the unexplained portion of the risk factor disclosures in year t. The results are reported in Table 4 Panel D. I find a positive and significant relation between the estimated CEO fixed effect and the residual of risk factor disclosure in year t at the 1% significance level for both the number of risk factors and the quality of the risk factor disclosures, providing support to my prior findings on the impact of CEO style.

[27] The interquartile range of CEO's fixed effect estimates for *RFQUALITY* is 1.49 and the interquartile range for firm's fixed effect estimates is 0.66, suggesting that the inferences are similar to that of *lnNUMRF*.

In summary, my results suggest that, despite the mandatory nature of the disclosure, CEO style influences risk factor disclosures incremental to firm-level characteristics and reporting incentives, and the effect of CEO style appears to be economically significant.

5. The effect of CEO overconfidence on risk factor disclosure

5.1. Research design

To test whether CEO overconfidence affects the content of risk factor disclosures (Hypothesis 2a, 2b), I estimate the following regression Model (2):

$$\begin{aligned} RiskFactorDisclosure_{i,t} &= \beta_1 Overconfidence_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 F\_AGE_{i,t} + \beta_4 RET_{i,t} + \beta_5 STDRET_{i,t} \\ &+ \beta_6 SKEWRET + \beta_7 SH\_TURNOVER_{i,t} + \beta_8 BETA_{i,t} + \beta_9 LEV_{i,t} + \beta_{10} BIG4_{i,t} \\ &+ \beta_{11} ETR_{i,t} + \beta_{12} LOSS_{i,t} + \beta_{13} SALES\_GROWTH_{i,t} + \beta_{14} BTM_{i,t} \\ &+ \beta_{15} lnANALYSTS_{i,t} + \beta_{16} CL\_IND_{i,t} + \beta_{17} LITIGATION_{i,t} \\ &+ \beta_{18} PROPRIETARY_{i,t} + \beta_{19} lnHOLDING_{i,t} + FIRM_i + YEAR_t + \varepsilon_{i,t} \quad (2) \end{aligned}$$

This model is similar to Model (1) but replaces CEO fixed effects with *Overconfidence*. As in my prior analysis, *RiskFactorDisclosure* is either *lnNUMRF* or *RFQUALITY*. I also estimate Model (2) using the dichotomous measures of high and low disclosure quality, *RFQ_HIGH* and *RFQ_LOW*.[28]

β_1 is the coefficient of interest. A significantly negative coefficient when *lnNUMRF* is the dependent variable would suggest that more overconfident CEOs identify fewer risk factors, consistent with Hypothesis 2a. Similarly, a significantly negative (positive) coefficient β_1 when *RFQUALITY* and *RFQ_HIGH* (*RFQ_LOW*) is the dependent variable would suggest that more overconfident CEOs provide lower quality information to stakeholders compared to firms with less overconfident CEOs, consistent with Hypothesis 2b. To ensure that CEO overconfidence

[28] When using *RFQ_HIGH* or *RFQ_LOW* as a dependent variable, I use the linear probability model estimated by OLS for three reasons: 1) the ease of coefficient interpretation 2) the ability to utilize all observations when estimating the coefficients rather than only utilizing observations with variation in the dependent variable, and 3) to avoid the incidental parameter problem. I address the problem of error heteroskedasticity by applying robust standard errors.

affects the risk factor disclosure incremental to the firm's underlying risk and other incentives, I control for other possible determinants of risk factor disclosure as in Model (1) as well as firm and year fixed effects.

Finally, to test whether CEO overconfidence is associated with the content of risk factor disclosures using an ex-post summary measure (i.e., SEC comment letters on risk factor disclosures), I estimate the regression Model (2) using CL_RF_{t+1} as the dependent variable. CL_RF_{t+1} captures whether a firm receives a comment letter from the SEC that references risk factors in the subsequent year.[29] A significantly positive coefficient on β_1 would suggest that the differential risk factor disclosures provided by overconfident CEOs result in a higher likelihood of receiving SEC comment letters, consistent with Hypothesis 2b.

5.2. Empirical results

5.2.1. Descriptive statistics and univariate analysis

Table 5 Panel A presents descriptive statistics of the main variables used in the analyses. Using the stock option-based measures, I classify approximately 23% of the CEO-firm years (982 CEOs) as being more overconfident. Panel B displays the Pearson and Spearman correlation between the main variables (below and above the diagonal, respectively). Consistent with prior research, the measures of firm risk (*STDRET*, *BETA*) and litigation (*LITIGATION*) are significantly positively correlated with the number of risk factors (*lnNUMRF*). The negative correlation between *lnNUMRF* and *CL_RF* indicates that disclosing fewer risk factors is correlated with receiving comment letters in the subsequent year at the univariate level.

[29] 99% of my sample receives 0 to 1 comment letters related to risk factor disclosures in the subsequent year. Only 19 firm-years receive 2 comment letters in the subsequent year. The results are substantially similar when I replace the indicator variable *CL_RF* to the number of comment letters received in the subsequent year.

Table 5 Panel C presents the univariate difference of risk factor disclosure quality and firm characteristics between firms with more overconfident CEOs and less overconfident CEOs. Firm-years with more overconfident CEOs disclose significantly more risk factors, consistent with the prior findings that overconfident CEOs make decisions that make the firms inherently riskier. Moreover, firm characteristics between firms with more overconfident CEOs and firms with less overconfident CEOs appear to be significantly different at the univariate level. Thus, it is important to control for observable factors related to firms' inherent risks as well as time invariant unobservable firm characteristics when examining the effect of overconfidence on the content of risk factor disclosures.

5.2.2. Main results of Hypothesis 2: The effect of CEO overconfidence on risk factor disclosure

Table 6 presents the results of estimating the effect of CEO overconfidence on the number of risk factors (Column (1)), the composite measure of risk factor disclosure quality (Column (2)), and indicator variables for high and low quality disclosers (Columns (3) and (4)). In Column (1), the coefficient of *Overconfident* is negative and significant, providing support for Hypothesis 2a that more overconfident CEOs disclose fewer risk factors than less overconfident CEOs. This result is consistent with overconfident CEOs having different perceptions of what is considered to be material risks. Importantly, the effect is incremental to other firm level factors that are known to affect risk factor disclosures. While the univariate analysis suggests that firms with more overconfident CEOs disclose *more* risk factors (presumably due to their risky decisions), the multivariate analysis suggests that overconfident CEOs are *less* likely to disclose risk factors after controlling for the firm's inherent risks. Consistent with the prior literature, I find that firms with higher stock return volatility, share turnover, leverage, and Big4 auditors disclose more risk factors and firms with more CEOs' stock and option holdings disclose fewer risk factors.

In Column (2) the coefficient of *Overconfident* is negative and significant, suggesting that more overconfident CEOs provide lower quality risk factor disclosures using the composite risk factor measure, consistent with Hypothesis 2b. In Column (3) I find evidence that firms with more overconfident CEOs are less likely to belong to the highest quality disclosure group (*RFQ_HIGH*). However, I do not find any evidence that CEO overconfidence affects the probability that firms belong to the lowest quality disclosure group (*RFQ_LOW*), suggesting that the effects of CEO overconfidence on the quality of risk factor disclosures are less likely to exist at the extreme negative level.

Table 7 Panel A reports the regression results when I use SEC comment letters related to risk factor disclosure in the subsequent year (*CL_RF*) as an ex-post summary measure of the content of risk factor disclosures. I find a significant and positive coefficient on *Overconfident*, providing further support to Hypothesis 2b. The findings suggest that firms with more overconfident CEOs are more likely to receive comment letters referencing risk factor disclosures in the subsequent year, presumably as a result of the lower quality risk factor disclosure. Consistent with the argument, I find evidence from path analysis (Panel B) that CEO overconfidence affects the likelihood of receiving SEC comment letters referencing risk factor disclosures in the subsequent year through, and only through, the lower quality risk factor disclosure.

Collectively, I find that firms with more overconfident CEOs are associated with identifying fewer risk factors, consistent with managers' different risk perceptions affecting their assessment of material risks and ultimately the disclosure outcomes. In addition, more overconfident CEOs are less likely to provide high quality risk factor disclosures in terms of the average word per factor, numeric intensity, and specificity than less overconfident CEOs, suggesting that different risk perceptions affect the content of risk factor disclosures. I further find

that the lower quality risk factor disclosure provided by overconfident CEOs lead firms to receive SEC comment letters on risk factor disclosures in the subsequent year.

5.2.3. Robustness tests

I conduct a robustness test to examine whether CEO overconfidence, and thereby differences in risk perceptions of CEOs, affects the content of risk factor disclosures incremental to CEOs' other demographic characteristics that likely contribute to their disclosure styles. While this test serves as a robustness check, it also allows me to examine how a broader set of managerial characteristics affect the content of risk factor disclosures.

Specifically, I estimate Model (2) with seven CEO demographic characteristics added. Based on prior literature, I consider (1) founder, (2) CPA, (3) MBA, (4) gender, (5) age, (6) CEO-Chairman duality, and (7) early career experience during recession (Bertrand and Schoar, 2003; Bamber et al., 2010; Dyreng et al., 2010; Ge et al., 2011; Davis et al., 2015; Schoar and Zuo, 2017). Detailed variable definitions are provided in Appendix 3.

Table 8 Panel A provides descriptive statistics for CEO characteristics on the large panel sample that I used to test Hypothesis 2. Similar to prior studies, 35% of my sample firm-year observations have CEOs who hold MBA degrees (Dyreng et al., 2010; Bamber et al., 2010). Not surprisingly, only 3.6% of my sample firm-year disclosures are made by female CEOs. Panel B reports the correlation matrix between CEO characteristics. The correlations between CEO characteristics suggest that overlaps between characteristics exist. Panel C presents the multivariate regression results of estimating Model (2), with CEO characteristics added. I find that overconfident CEOs' effect on risk factor disclosure continues to be associated with disclosing fewer risk factors and providing lower quality risk factor disclosure, incremental to CEO demographic characteristics. I also find that similar to overconfident CEOs, MBA CEOs disclose

fewer risk factors and provide lower quality risk factor disclosure. Female CEOs and CEOs who started their career during recession provide higher quality disclosure whereas older CEOs are more likely to provide lower quality disclosure on average. However, despite some evidence that CEO demographic characteristics are related with lower quality disclosure, I do no find evidence that these characteristics are significantly related with the likelihood of receiving comments letters.

Overall, I find that the effect of CEO overconfidence on the content of risk factor disclosures is not subsumed by CEO demographic characteristics and these characteristics play a limited role in explaining the content of risk factor disclosures as in prior studies (Bamber et al., 2010; Ge et al., 2011).[30]

6. Additional analyses

6.1. Change analysis

I include firm fixed effects in all of my analyses to control for any unobservable time-invariant firm characteristics that may affect the risk factor disclosure. This approach allows me to capture the within-firm variation in risk factor disclosures. However, in order to estimate my coefficients of interest, this approach requires either a manager to change firms within the sample (for the CEO style test) or a firm to have both overconfident and non-overconfident CEOs over time (for the CEO overconfidence test). As a simpler approach, I conduct a change analysis on a broader sample to examine whether a change in CEO is associated with changes in the content of risk factor disclosure. As presented in Table 9, I find corroborating evidence that a change in CEO

[30] I conduct this test to provide a more complete picture of the effect of CEO-specific factors on the content of risk factor disclosures. However, prior studies find mixed evidence between managers' disclosure style and demographic characteristics such as age, gender, and education presumably because demographic characteristics are limited or incomplete proxies of managers' cognitive frames (Ge et al., 2011). When I further examine the relation between CEO style and CEOs' demographic characteristic and CEO overconfidence, I find limited evidence of the association between these measures, consistent with the argument that manager style goes beyond these observable characteristics (Bamber et al., 2010; Ge et al., 2011). Note that the two parts of my study complement each other in that my measure of CEO style captures the time-invariant aspect of style and my measure of CEO overconfidence captures the time-variant aspect of overconfidence.

is significantly related to a change in the absolute number of risk factors and a change in the likelihood of receiving an SEC comment letter on risk factor disclosures. However, I fail to find a significant relation between a change in CEO and a change in the quality of content.

6.2. Role of auditors and general counsels

Anecdotal evidence based on interviews with practitioners suggests that the role of auditors and general counsels in preparing and finalizing the risk factor disclosure varies by firms (see Footnote 2). As long as the audit and/or legal environment does not change within a firm across my sample period, the firm fixed effects would capture any time-invariant auditor or general counsel influence on the content of risk factor disclosures. Nevertheless, to address concerns about biases introduced by time varying effects of auditors and/or general counsels, I conduct additional analyses as follows.

While I control for the effect of Big 4 auditors on risk factor disclosures in all of my analyses (see Section 4.1), I conduct an additional analysis that includes auditor fixed effects to alleviate the concern that the results are driven by changes in auditors (i.e., auditor style) that may occur concurrently with changes in CEOs (Menon and Williams, 2008). Table 10 presents the results. I find that my results are robust to including auditor fixed effects in place of the indicator for Big 4 auditors (*BIG4*) in both the CEO style and CEO overconfidence specifications (Panel A and Panel B, respectively). For the CEO style specification, I find that the CEO fixed effects remain jointly significant when auditors fixed effects are included. Also, the increases in adjusted R^2s when I add CEO fixed effects to the benchmark model that includes firm and auditor fixed effects remain similar. Thus, I conclude that my results are not driven by auditor effects.

Prior research finds that risk factor disclosures provide a litigation shield to firms (Huang et al., 2019), and thus firms with high litigation risk disclose more risk factors (Gaulin, 2017;

Nelson and Pritchard, 2016). Although CEOs are the final decision makers of firms, it is possible that general counsels who advise top management on legal issues and litigation risk exert their preferences on CEOs and thus influence firm disclosures, especially when they are in the top management team (Bamber et al., 2010; Kwak et al., 2012; Hopkins et al., 2015). Therefore, I conduct an additional analysis that controls for the existence of general counsel in the top management team. I identify a firm's general counsel in the top management team via the annual job titles provided by Execucomp. I search the annual titles for the word "counsel", "law", "legal", and other variants following Kwak et al. (2012). I find that 47% of my CEO style sample firm-years and 52% of the firm-years for my CEO overconfidence sample have general counsels as part of the top management team, similar to prior studies (Kwak et al., 2012).

As presented in Table 11, I find that my results are robust to controlling for the existence of general counsel. In Panel B, I also find that having a general counsel in the top management team is significantly related to disclosing more risk factors and providing lower quality disclosures in my CEO overconfidence sample. This is consistent with the conjecture that the primary role of general counsels concerning risk factor disclosure is to reduce the expected cost of litigation by disclosing more risk factors and leaving the content vague with less specific words and numerical discussions. Taken together, my results suggest that CEO style and CEO overconfidence affect the content of risk factor disclosures incremental to the influence of general counsels on the risk factor disclosures.

6.3. Powerful CEOs

While CEOs are already "powerful actors" who can shape organizational outcomes based on upper echelon theory (Hambrick and Mason, 1984), and the SEC grants a high level of managerial discretion in deciding the content of risk factor disclosures, it is possible that a CEO

who has more power within the firm would have greater discretion available to influence the content of risk factor disclosures than a CEO with less power. Therefore, I examine whether there is cross-sectional variation in the association between CEO overconfidence and the content of risk factor disclosures.

I create a composite measure of power based on whether a CEO is the Chairman of the Board, whether a CEO is a founder of the firm, and whether a CEO's relative cash compensation (i.e., the CEO's salary and bonus to that of the second-highest paid executive at the firm) is in the top tercile of the sample (Feng et al., 2010; Hayward and Hambrick, 1997). As previously reported in Table 8 Panel A, I find that CEOs hold a dual role in 46% of my sample firm-years, and CEOs are founders in 9% of my sample firm-years. The three CEO power variables are significantly correlated with each other (untabulated). I sum the three indicator variables and use the composite measure, *Power*, in my additional analyses.

The results are reported in Table 12. While my main results remain mostly unchanged, I find limited evidence on the effect of powerful CEOs. The interaction term between *Overconfident* and *Power* when examining the number of risk factors suggests that the effect of overconfident CEOs on the number of risk factors is concentrated in powerful CEOs in my sample. The significantly positive correlations between *Overconfident* and *Dual* and *Founder* reported in Table 8 Panel B suggest that CEO power may be reinforcing CEO overconfidence via the better-than-average facet or illusion of control facet.

6.4. Overconfidence classification

I follow prior literature on overconfident CEOs based on option holding behavior and classify CEOs as more overconfident the *second* time they display the behavior of holding 100% moneyness options. This approach not only alleviates concerns related to misclassifying CEOs

who happen to hold in the money options by one-time luck but also aligns well with the findings from psychology that suggest overconfidence is not a stable trait but intensifies when combined with positive self-attribution in related prior experience (Langer and Roth, 1975; Alicke et al. 1995). However, this approach does treat overconfidence as a time-varying characteristic rather than a persistent trait, and some psychology research suggests that different facets of overconfidence may have different persistence (Moore and Healy, 2008). For example, Moore and Healy (2008) find that miscalibration is more persistent than over-optimism and better-than-average effects.

In an effort to measure managerial overconfidence as a persistent managerial trait, I classify a CEO as overconfident for the *entire sample period* if the CEO holds 100% moneyness options twice *at any time* during the sample period. This classification allows a manager to be overconfident throughout the entire sample period regardless of the timing of the option holding behavior. As reported in Table 13, I find that the effect of CEO overconfidence on the content of risk factor disclosures continues to be significant. However, I fail to find evidence that the number of risk factors and SEC comment letters received in the subsequent year are related to CEO overconfidence using this definition of overconfidence. It should be noted however that the analysis is conducted with firm fixed effects, consistent with my other analyses. Hence, firms with only one type of CEO (e.g., only CEOs classified as overconfident) are excluded from the estimation, and the amended classification scheme further limits the within-firm variation in CEO type.

6.5. CEO vs. CFO

CEOs and CFOs are likely to be responsible for different aspects of firm disclosure (Davis et al., 2015), especially in the context of risk factor disclosures. Since CEOs make the final

decisions about a firm's operation and investment projects which directly affect the firm's risks, one might expect overconfident CEOs to be associated with fewer disclosed risk factors. CFOs, on the other hand, are primarily responsible for overseeing firms' financial reporting process and quality, and therefore, overconfident CFOs are perhaps more likely to affect the quality of risk factor disclosures. Consistent with this conjecture, prior studies find the manifestation of overconfidence differs between CEOs and CFOs in that CEO overconfidence is reflected in investment and financing decisions whereas CFO overconfidence is reflected in financial reporting (Chen et al., 2014; Malmendier et al., 2012).

To examine the combined effect of CEO and CFO overconfidence on risk factor disclosures, I conduct an analysis by including indicators for whether a firm has either an overconfident CEO, an overconfident CFO, both, or neither. As presented in Table 14, I find that while having both an overconfident CEO and CFO is not significantly related to the number of risk factors, firms with *either* overconfident CEOs or overconfident CFOs disclose fewer risk factors than firms with neither. Also, I find that firms that have only an overconfident CEO provide significantly lower quality risk factor disclosures whereas having only an overconfident CFO is not significantly associated with the quality of disclosure. Further, I find that firms with both overconfident CEO and CFOs are less likely to be high quality disclosers and are more likely to receive SEC comment letters on their risk factor disclosures. Collectively, these findings suggest that both CEO and CFOs' overconfidence affect firms' risk factor disclosures.

7. Conclusion

This study provides evidence that the different risk perceptions of individual CEOs affect their assessment of material risks and, as a result, affect the content of risk factor disclosures. Specifically, using CEO fixed effects, I find that CEOs' styles are reflected in the content of risk

factor disclosures. This is contrary to the concern that risk factor disclosures overload investors with information crafted by legal counsels rather than reflecting managers' risk assessment. I also find that firms with more overconfident CEOs disclose fewer risk factors and provide lower quality disclosure, providing more direct evidence that CEO risk perceptions affect the information provided in risk factor disclosures. This evidence is important given that the SEC is considering changes to the disclosure requirements, such as whether to employ a quantitative threshold for the disclosure and whether to require managers to provide discussions on the materiality of risks. It is possible that requiring managers to disclose the specific quantitative thresholds used in determining material risks will reduce the influence of these idiosyncratic managerial risk perceptions and provide more comparable risk factor disclosures across firms.

However, my study is subject to the following caveats. First, while I control for firm fixed effects as well as a number of time-varying firm characteristics, reporting incentives, and CEOs' equity incentives, I cannot rule out the possibility that other time-varying firm effects that are not included in my analysis are affecting the content of risk factor disclosures (e.g., firm strategy and policy choices (Gow et al., 2016)). Second, CEOs' risk perceptions (either biased or unbiased) are, by nature, difficult to measure. Thus, the validity of my inferences hinge on the validity of the proxies I use to measure the constructs. Third, my results can only generalize to CEOs from S&P 1,500 firms since I obtained CEO information from the ExecuComp database. Finally, the results document an association and not a causal link between CEOs' styles (and CEO overconfidence in particular) and the content of risk factor disclosures.

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Appendix 1. Examples of risk factor disclosure

Excerpt of risk factor disclosure from NIKE, Inc.'s Form 10-K for the fiscal year ended on May 31, 2011:

"***Natural disasters could negatively impact our operating results and financial condition. The March 11, 2011 Japanese earthquake and resulting tsunami negatively affected our Japanese revenue and profits for the fourth quarter ended May 31, 2011, and we expect those events to continue to adversely affect us during fiscal year 2012.***

On March 11, 2011, Japan experienced a significant earthquake and resulting tsunami. The implications from ongoing events and widespread damage to the nation's infrastructure, consumer confidence and overall economy remain unclear. Our revenues and profits for our Japan businesses were negatively impacted during the fourth quarter of fiscal year 2011, and although we cannot fully assess the future financial impact of these ongoing events, we do expect our Japanese businesses to continue to be adversely impacted throughout fiscal 2012."

Excerpt of risk factor disclosure from Tesla, Inc.'s Form 10-K for the fiscal year ended on December 31, 2017:

"***We are significantly dependent upon revenue generated from the sale of a limited fleet of electric vehicles, which currently includes Model S, Model X and Model 3.***

Historically, automobile customers have come to expect a variety of vehicles offered in a manufacturer's fleet and new and improved vehicle models to be introduced frequently. In order to meet these expectations, we may in the future be required to introduce on a regular basis new vehicle models as well as enhanced versions of existing vehicle models. To the extent our product variety and cycles do not meet consumer expectations, or cannot be produced on our projected timelines and cost and volume targets, our future sales may be adversely affected. This could have a material adverse effect on our business, prospects, financial condition and operating results."

Excerpt of risk factor disclosure from ALASKA AIR GROUP, INC.'s Form 10-K for the fiscal year ended on December 31, 2017:

"***We will need to launch certain branding or rebranding initiatives in connection with the integration that may take a significant amount of time and involve substantial costs and that may not be favorably received by our guests.***

We may incur substantial costs as a result of rebranding Virgin America's products and services, including updating the aircraft livery and configuration, and may not be able to achieve or maintain brand name recognition or status that is comparable to the recognition and status previously enjoyed by Virgin America in any of Virgin America's markets. The failure of any such rebranding initiatives could adversely affect our ability to attract and retain guests, which could cause us not to realize some or all of the anticipated benefits contemplated to result from the acquisition."

Appendix 2. Examples of SEC comment letters on risk factor disclosure

Excerpt of comment letter dated July 5, 2012 on Quanex Building Products Corporation's Form 10-K for the fiscal year ended on October 31, 2011:

"In future filings, **please include a separate risk factor discussing the risks presented by existing and contemplated laws, regulations and government initiatives that materially impact your business**. We note in particular the discussion in your MD&A and in your earnings call for the fourth quarter of 2011 regarding the impact of the expiration of the first time homebuyers' tax credit and the tax credit for energy efficient windows. Please ensure that your risk factor includes specific examples of how the various laws, regulations and government initiatives have impacted the operation of your business, including discussing any specific material impact on operating results."

"*If the Company's raw materials or energy were to significantly increase in price…, page 13*
The Company is subject to various environmental requirements…, page 13
The Company may not be able to successfully identify, manage or integrate future acquisitions… page 13

In future filings, please revise each of these risk factors, or add new risk factors, as appropriate, to provide specific examples of how each of these risks have impacted the operation of your business, including discussing any specific material impact on operating results. We note that **each of these risks appears relatively generic despite the fact that the company has been impacted by specific events relating to such risks**. In particular, we note that your operating results are impacted by both aluminum costs and the integration of acquisitions, such as Edgetech, both of which are discussed in detail in your earnings call for the fourth quarter of 2011 and first quarter of 2012. In addition, we note that you are currently undertaking ongoing remediation activities at your Nichols Aluminum-Alabama, LLC subsidiary, but the costs and material impact of this remediation are not discussed in the relevant risk factor. In future filings, **please ensure that each of your risk factors is appropriately tailored to your specific business and circumstances and includes examples of the impact of such risks on your results of operations**."

Excerpt of comment letter dated March 12, 2015 on H.B. Fuller Company's Form 10-K for the fiscal year ended on November 29, 2014:

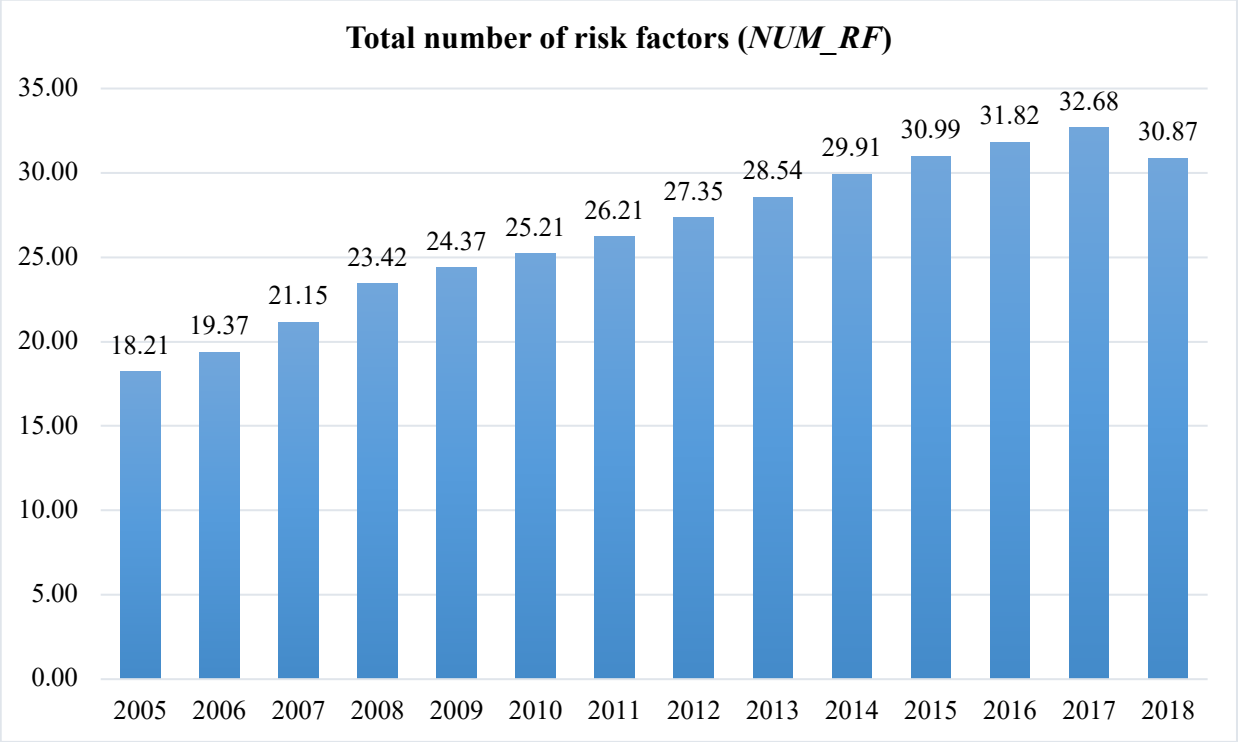
"Despite the fact that the majority of your revenues are derived internationally**, your discussion of the risks facing you as a result of foreign operations is limited to a single, four sentence risk factor on page 8**. Moreover, you do not provide a substantive discussion of the impact of foreign currency fluctuations, despite the fact that management expects foreign currency fluctuations to halve organic growth in 2015, as stated in your earnings call for fiscal 2014 and on page 19 of this Form 10-K. Similarly, you provide only a cursory description of the risks posed by fluctuations in the price of raw materials, despite such prices making up 77% of your cost of sales. In future filings **please provide a more fulsome description of the material risks facing your company and provide appropriate context for investors to understand the scope of the risk and how it may impact your company**."

Appendix 3. Variable definitions

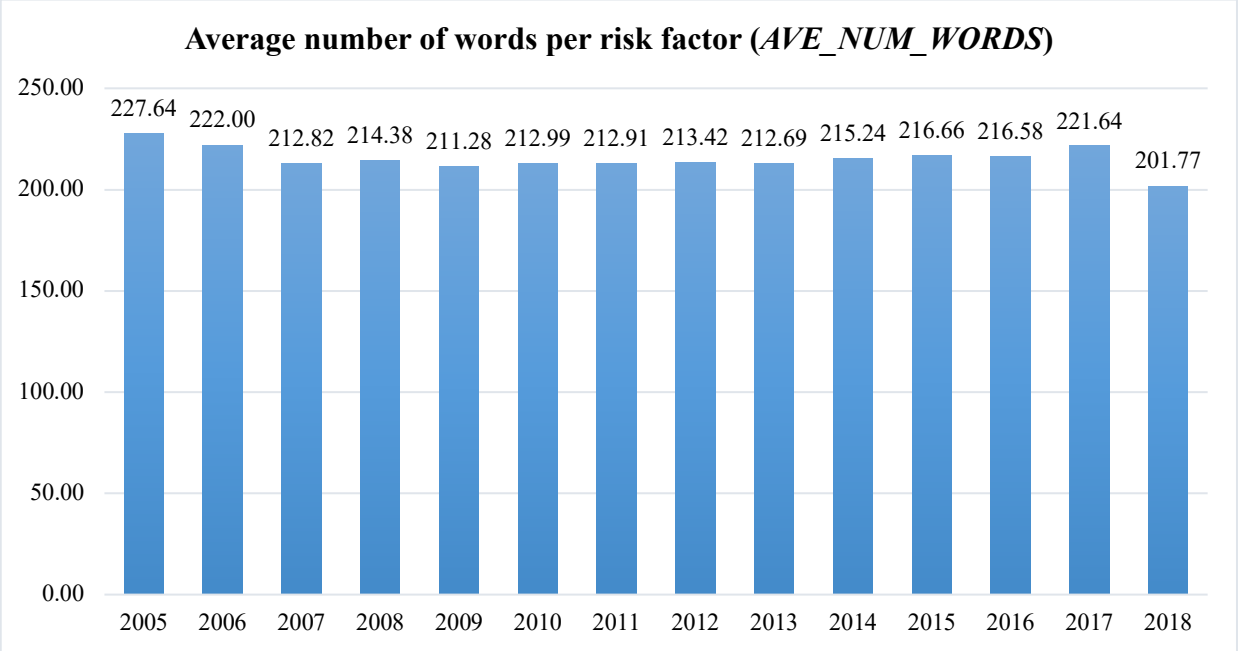
Variables for risk factor disclosure	
NUM_RF	the total number of identified risk factors under Item 1A of the annual report for each firm
lnNUMRF	the natural logarithm of *NUM_RF*
TOTAL_NUM_WORDS_RF	the number of words in the Item 1A disclosure excluding stop words
AVE_NUM_WORDS	the average number of words used in each risk factor excluding stop words
NUM_NUMERIC	the portion of non-date numbers in the risk factor disclosure
NUM_SPECIFIC	the portion of proper nouns identified by the Stanford Named Entity Recognition (NER) algorithm that belongs to location, person, and organization category in the risk factor disclosure
RFQUALITY	the average of tercile ranks of each component: *AVE_NUM_WORDS, NUM_NUMERIC, NUM_SPECIFIC*
RFQ_HIGH	an indicator variable equal to 1 if the firm-year is in the top tercile for all four disclosure quality measures: *AVE_NUM_WORDS, NUM_NUMERIC, NUM_SPECIFIC*
RFQ_LOW	an indicator variable equal to 1 if the firm-year is in the bottom tercile for all four disclosure quality measures: *AVE_NUM_WORDS, NUM_NUMERIC, NUM_SPECIFIC*
CL_RF	an indicator variable equal to 1 if a firm receives a SEC comment letter in a given fiscal year that references risk factor disclosure and 0 otherwise
Variables for CEO	
Overconfidence	an indicator variable equal to 1 for all CEO-firm-years following the second time *Inthemoneyness* is at least 100% for a given CEO during my sample period and 0 otherwise $Inthemoneyness = \frac{Average\ value\ per\ vested\ option}{Average\ strike\ price}$ *Average value per vested option* $= \frac{Total\ value\ of\ the\ manager's\ vested\ unexercised\ options}{Number\ of\ vested\ unexercied\ options}$ *Average strike price* = Firm's stock price at the end of the fiscal year – Average value per vested option
Founder	is an indicator equal to 1 if the CEO is from the firm's founding family and 0 otherwise
CPA	an indicator equal to 1 if the CEO has CPA qualifications and 0 otherwise
MBA	an indicator equal to 1 if the CEO holds an M.B.A. degree and 0 otherwise.
Gender	an indicator equal to 1 if the CEO is a female and 0 otherwise

Age	the age of the CEO as of the fiscal year end of the risk factor disclosure filing year
Dual	an indicator equal to 1 if the CEO has duality in the CEO and chairman positions and 0 otherwise
Recession	an indicator equal to 1 if the CEO start his/her career (based on year of birth plus 24 years) during a recession and 0 otherwise following Schoar and Zuo (2017)
Other control variables	
SIZE	the natural log of the market value of equity (*PRCC_F * CSHO*)
F_AGE	the firm age using the COMPUSTAT date of incorporation
RET	the daily buy and hold return for the 250-trading day period ending two trading days before the 10-K release
STDRET	the standard deviation of daily abnormal return for the 250-trading day period ending two trading days before the 10-K release (*Std.Dev (RET – VWRETD)*)
SKEWRET	skewness of daily abnormal returns for the 250-trading day period ending two trading days before the 10-K release (*Skew(RET-VWRETD)*)
SH_TURNOVER	the ratio of average daily share turnover (share volume to outstanding shares at fiscal year-end) for the 250-trading day period ending two trading days before the 10-K release
BETA	the firm's coefficient loading on the market excess return (Fama and French) for the 250-trading day period ending two trading days before the 10-K release
LEV	the firm's book value of debt to total asset (*DLTT + DLC / AT*)
BIG4	an indicator variable equal to 1 if the auditor is Big 4 auditor firm (i.e. PricewaterhouseCoopers, KPMG, Ernst & Young, or Deloitte) and 0 otherwise
ETR	total tax expense divided by pre-tax income (*TXT / NI + TXT*)
LOSS	an indicator equal to 1 if net income to the assets at the beginning of the year (NI/AT_{t-1}) is negative and 0 otherwise
BTM	the book to market value of equity (*SEQ/SIZE*)
SALES_GROWTH	the ratio of change in sales to lagged total assets ($Sales_{t} – Sales_{t-1} / AT_{t-1}$)
ANALYST	the number of analysts following the firm as reported by IBES
CL_IND	the number of SEC comment letters the entire industry (SIC3) received during the fiscal year
LITIGATION	a value of 1 if a securities litigation is filed during the fiscal year
PROPRIETARY	R&D intensity, the ratio of R&D expense to total lagged total asset, missing data is replaced by zero following Hope et al. (2016)
HOLDING	the manager's total value of holdings in the firm inclusive of options and stock holdings
lnHOLDING	the natural logarithm of *HOLDING*
TOTAL_NUM_WORDS_10K	the number of words in the 10-K disclosure excluding stop words

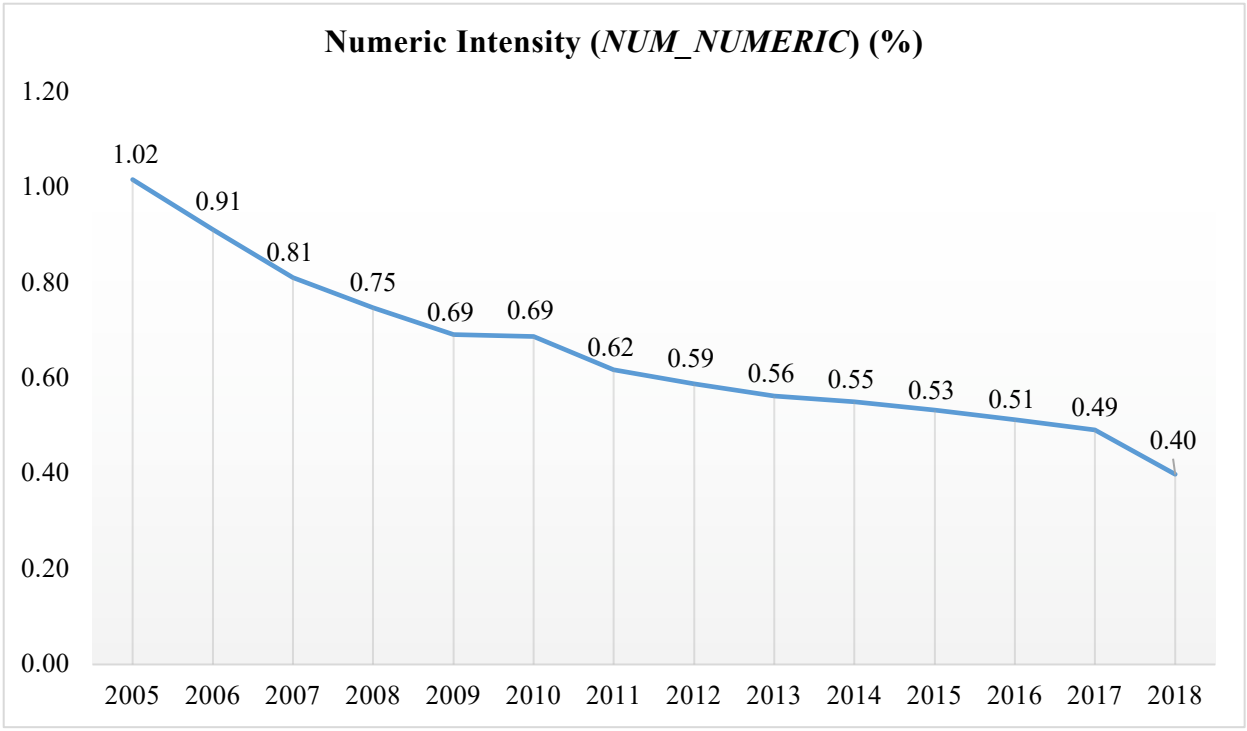
Figure 1. Time trend of risk factor disclosure measures



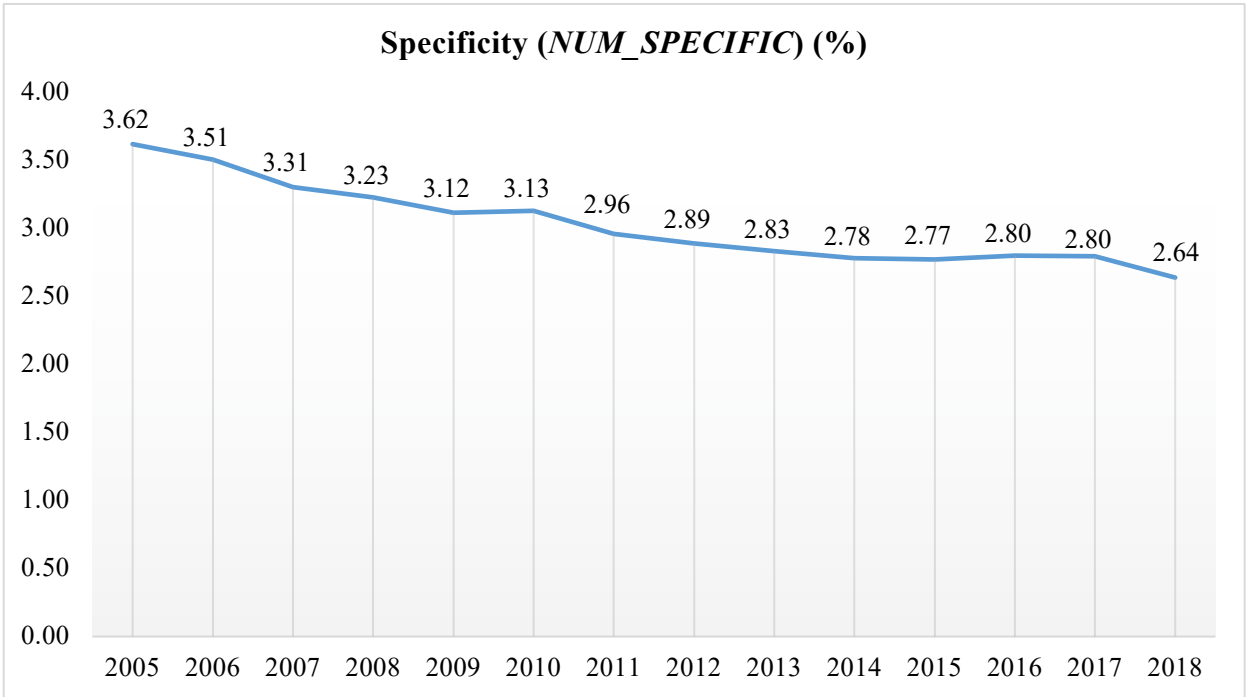
This figure illustrates the total number of risk factor disclosures between the years 2005 and 2018.



This figure illustrates the average number of words used in each risk factor between the years 2005 and 2018.



This figure illustrates the numerical intensity of the risk factor disclosure measured by the portion of non-date numbers between the years 2005 and 2018.



This figure illustrates the specificity of the risk factor disclosure measured by the portion of proper nouns in the risk factor disclosure between the years 2005 and 2018.

Table 1. Sample construction and sample description

Panel A. Sample construction for testing CEO style (Hypothesis 1)

	Number of firm-years	Number of distinct firms	Number of distinct CEOs
CEO-firm matched sample for CEOs that worked for at least two firms as CEOs from ExecuComp	1205	314	166
Less: CEOs who worked in a firm for less than one year	(134)	(39)	(24)
Less: Firm-years that having missing data	(130)	(25)	0
Less: Firm-years with less than 2 filler years and CEOs who worked in a firm with only available data for one firm	(107)	(22)	(24)
CEO-firm matched sample	834	228	118

This table reports the sample construction procedure for the CEO-firm matched sample during the sample period of 2005-2018.

Panel B. Frequency of CEOs based on the number of years at each firm

N of years in each firm	N of CEO-firm pairs	Percentage (%)
1	55	23.21
2	41	17.3
3	51	21.52
4	26	10.97
5	18	7.59
6	17	7.17
7	12	5.06
8	5	2.11
9	5	2.11
10	3	1.27
11	1	0.42
12	1	0.42
13	2	0.84
Total	237	100

This table presents the frequency of distinct CEO-firm pairs based on the number of years the CEO worked for each firm.

Panel C. Frequency of firms based on the number of distinct CEOs

N of distinct CEOs	Frequency of firms	Percentage (%)
1	219	96.05
2	9	3.95
Total	228	100

This table presents the frequency of firms based on the number of distinct CEOs in my sample.

Panel D. Frequency of CEOs based on the number of distinct firms

N of distinct firms	Frequency of CEOs	Percentage (%)
2	117	99.15
3	1	0.85
Total	118	100

This table presents the frequency of CEOs based on the number of firms they worked in my sample.

Panel E. Sample construction for testing CEO overconfidence (Hypothesis 2)

		Number of firm-years
Number of firm-years between 12/01/2005-12/31/2018		153,738
Less: Observations with missing historical Central Index Key (CIK) identifiers	(36,011)	117,727
Less: Observations with missing total assets	(11,405)	106,322
Less: Observations without CEO information from ExecuComp	(80,540)	25,782
Less: Observations where CEOs do not hold options	(5,070)	20,712
Less: Observations that are unable to identify SEC EDGAR filings	(2,268)	18,444
Less: Observations with missing data on control variables for the main sample	(80)	18,364
Final sample		**18,364**
Number of unique firms		**2,320**
Number of unique CEOs		**3,826**

This table reports the sample construction procedure for a large panel sample during the sample period of 2005-2018.

Table 2. Descriptive statistics for measures of risk factor disclosures
Panel A. Descriptive statistics for textual variables

	Sample for testing CEO style (Hypothesis 1)						Sample for testing CEO overconfidence (Hypothesis 2)					
Variable	N	Mean	Std Dev	Q1	Median	Q3	N	Mean	Std Dev.	Q1	Median	Q3
NUMRF	1,376	27.784	12.608	19	26	34	18,364	25.851	11.629	17	24	32
lnNUMRF	1,376	3.265	0.445	2.996	3.296	3.555	18,364	3.194	0.450	2.890	3.219	3.497
AVE_NUM_WORDS	1,376	217.946	172.460	142.117	179.124	228.869	18,364	216.905	158.501	143.474	178.109	231.455
NUM_NUMERIC	1,376	0.007	0.009	0.002	0.004	0.008	18,364	0.007	0.009	0.003	0.005	0.008
NUM_SPECIFIC	1,376	0.033	0.022	0.018	0.027	0.040	18,364	0.030	0.019	0.017	0.025	0.039
RFQUALITY	1,376	2.002	0.548	1.667	2.000	2.333	18,364	2.003	0.549	1.667	2.000	2.333
RFQ_HIGH	1,376	0.102	0.303	0	0	0	18,364	0.100	0.300	0	0	0
RFQ_LOW	1,376	0.052	0.221	0	0	0	18,364	0.050	0.218	0	0	0
TOTAL_NUM_WORDS_RF	1,376	5,976.100	4,339.450	3,016	5,007	7,598	18,364	5,682.050	4,448.440	2,769	4,506	7,163
TOTAL_NUM_WORDS_10K	1,376	49,288.790	19,857.650	35,653	44,955	58,547	18,364	45,672.470	18,437.750	34,016	42,510	54,076
CL_RF	1,273	0.049	0.215	0	0	0	17,305	0.048	0.213	0	0	0

This table provides descriptive statistics for measures of risk factor disclosure used in my analyses. All variables are defined in Appendix 3.

Panel B. Correlations between textual variables

	Sample for testing CEO style (Hypothesis 1)						Sample for testing CEO overconfidence (Hypothesis 2)					
Variable	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
(1)NUM_RF	*1*	**0.23**	**-0.27**	-0.03	**0.73**	**0.36**	*1*	**0.24**	**-0.22**	**0.04**	**0.77**	**0.39**
(2)AVE_NUM_WORDS	-0.04	*1*	0.00	**0.31**	**0.76**	**0.27**	0.01	*1*	**0.04**	**0.37**	**0.75**	**0.33**
(3)NUM_NUMERIC	**-0.18**	**0.41**	*1*	**0.17**	**-0.11**	**-0.08**	**-0.16**	**0.51**	*1*	**0.20**	**-0.08**	**-0.08**
(4)NUM_SPECIFIC	**-0.05**	**0.35**	**0.21**	*1*	**0.22**	**0.17**	0.01	**0.36**	**0.31**	*1*	**0.29**	**0.22**
(5)TOTAL_NUM_WORDS_RF	**0.59**	**0.71**	**0.22**	**0.25**	*1*	**0.37**	**0.59**	**0.74**	**0.32**	**0.31**	*1*	**0.43**
(6)TOTAL_NUM_WORDS_10K	**0.33**	**0.08**	-0.02	**0.18**	**0.26**	*1*	**0.39**	**0.12**	**-0.02**	**0.20**	**0.35**	*1*

This table presents the Pearson and Spearman correlation matrix for the textual variables used in my analyses below and above the diagonal respectively. All variables are defined in Appendix 3. The values in bold indicate significant correlation coefficients at better than the 10% level, based on the two-tailed tests.

Table 3. Summary statistics for the variables used for testing CEO style (Hypothesis 1)
Panel A. Descriptive statistics

Variable	N	Mean	Std Dev	Q1	Median	Q3
lnNUMRF	1,376	3.265	0.445	2.996	3.296	3.555
RFQUALITY	1,376	2.002	0.548	1.667	2.000	2.333
SIZE	1,376	7.891	1.563	6.792	7.807	9.021
F_AGE	1,376	30.753	18.942	15.000	26.000	47.000
RET	1,376	0.129	0.501	-0.135	0.082	0.322
STDRET	1,376	0.021	0.013	0.013	0.018	0.026
SKEWRET	1,376	0.265	1.596	-0.390	0.217	0.858
SH_TURNOVER	1,376	0.011	0.007	0.006	0.009	0.013
BETA	1,376	1.044	0.356	0.800	1.014	1.236
LEV	1,376	0.262	0.197	0.102	0.250	0.385
BIG4	1,376	0.938	0.241	1.000	1.000	1.000
ETR	1,376	0.167	0.518	0.036	0.273	0.361
LOSS	1,376	0.226	0.418	0.000	0.000	0.000
SALES_GROWTH	1,376	0.030	0.174	-0.025	0.019	0.090
BTM	1,376	0.566	0.550	0.286	0.473	0.753
ANALYSTS	1,376	14.182	9.998	7.000	12.000	20.000
lnANALYSTS	1,376	2.459	0.805	2.079	2.565	3.045
CL_IND	1,376	76.100	104.595	8.000	26.000	103.000
LITIGATION	1,376	0.041	0.198	0.000	0.000	0.000
PROPRIETARY	1,376	0.032	0.053	0.000	0.000	0.046
HOLDING	1,376	44,337.950	126,174.450	2,762.980	9,387.510	25,532.190
lnHOLDING	1,376	8.831	2.689	7.924	9.147	10.148

This table provides descriptive statistics the main variables used in my analyses for Hypothesis 1. The sample consists of 1,376 firm-year observations which is composed of 834 observations from the CEO-firm matched sample and 542 observations for the filler years. All variables are defined in Appendix 3.

Panel B. Correlations

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*	*(13)*	*(14)*	*(15)*	*(16)*	*(17)*	*(18)*	*(19)*	*(20)*
(1)lnNUMRF	*1*	-0.01	0.04	**-0.27**	0.03	0.04	**-0.05**	0.04	0.02	**-0.05**	**-0.12**	**-0.13**	**0.06**	0.04	0.02	0.02	**0.25**	**0.06**	**0.13**	**0.05**
(2)RFQUALITY	-0.01	*1*	**0.14**	**-0.08**	**0.07**	**-0.08**	0.01	**-0.08**	-0.02	**0.07**	-0.03	0.03	**-0.10**	**0.06**	-0.02	**0.05**	**0.09**	**0.05**	-0.01	**0.12**
(3)SIZE	0.02	**0.14**	*1*	**0.15**	**0.19**	**-0.58**	**-0.10**	**-0.09**	**-0.11**	**0.08**	**0.28**	**0.12**	**-0.37**	**0.14**	**-0.26**	**0.65**	0.02	0.03	0.02	**0.55**
(4)F_AGE	**-0.24**	**-0.07**	**0.18**	*1*	-0.02	**-0.19**	**-0.06**	**-0.09**	0.02	**0.12**	**0.15**	0.04	0.00	**-0.14**	**0.04**	**-0.07**	**-0.14**	-0.04	**-0.05**	0.00
(5)RET	0.02	**0.05**	**0.10**	-0.03	*1*	**-0.25**	**0.32**	**-0.12**	**-0.05**	**-0.05**	0.02	**0.07**	**-0.19**	**0.10**	**-0.23**	0.03	0.04	**-0.07**	0.01	**0.23**
(6)STDRET	0.03	**-0.05**	**-0.56**	**-0.15**	**-0.06**	*1*	**0.15**	**0.53**	**0.36**	**-0.07**	**-0.18**	**-0.13**	**0.44**	**-0.11**	**0.18**	**-0.19**	0.00	**0.10**	**0.08**	**-0.40**
(7)SKEWRET	-0.01	0.00	**-0.08**	**-0.07**	**0.29**	**0.15**	*1*	**0.04**	**0.09**	-0.03	**-0.09**	0.01	**0.07**	0.00	-0.01	**-0.09**	-0.03	-0.02	-0.04	-0.03
(8)SH_TURNOVER	0.02	**-0.07**	**-0.11**	**-0.08**	**-0.05**	**0.46**	0.04	*1*	**0.32**	0.01	**0.09**	0.00	**0.14**	0.03	0.01	**0.27**	-0.03	**0.13**	**0.09**	**-0.09**
(9)BETA	0.01	-0.02	**-0.12**	0.01	**0.05**	**0.39**	**0.06**	**0.33**	*1*	-0.01	0.01	**-0.10**	**0.14**	-0.02	0.03	-0.02	0.02	0.01	**0.15**	**-0.08**
(10)LEV	-0.01	**0.07**	**0.06**	**0.09**	**-0.05**	**0.06**	0.00	0.02	**0.05**	*1*	**0.10**	**-0.07**	**0.07**	**-0.05**	**-0.18**	-0.03	**-0.16**	0.02	**-0.24**	**0.09**
(11)BIG4	**-0.11**	-0.03	**0.28**	**0.14**	-0.01	**-0.15**	**-0.07**	**0.09**	0.02	**0.09**	*1*	0.00	**-0.08**	0.00	**-0.05**	**0.23**	**-0.08**	-0.04	**-0.08**	**0.08**
(12)ETR	**-0.06**	0.04	**0.10**	**0.06**	**0.05**	**-0.12**	0.03	-0.02	**-0.06**	-0.02	0.00	*1*	**-0.30**	**0.20**	-0.01	**0.09**	**-0.13**	-0.01	**-0.20**	**0.17**
(13)LOSS	**0.06**	**-0.11**	**-0.38**	-0.02	**-0.11**	**0.48**	0.04	**0.17**	**0.16**	**0.09**	**-0.08**	**-0.16**	*1*	**-0.32**	**0.18**	**-0.16**	0.00	**0.08**	**0.05**	**-0.35**
(14)SALES_GROWTH	**0.05**	0.04	**0.11**	**-0.13**	0.02	**-0.15**	0.01	0.03	-0.02	**-0.05**	-0.02	**0.10**	**-0.28**	*1*	**-0.23**	**0.11**	0.03	-0.01	**0.08**	**0.23**
(15)BTM	0.02	0.01	**-0.22**	0.00	**-0.17**	**0.30**	0.02	**0.12**	0.04	**-0.20**	**-0.07**	0.00	**0.19**	**-0.11**	*1*	**-0.17**	0.00	0.03	**-0.30**	**-0.21**
(16)lnANALYSTS	-0.01	**0.05**	**0.60**	**-0.05**	-0.03	**-0.21**	**-0.09**	**0.21**	**-0.05**	-0.01	**0.23**	0.03	**-0.15**	**0.10**	**-0.11**	*1*	**0.05**	**0.08**	**0.15**	**0.26**
(17)CL_IND	**0.22**	**0.08**	**0.05**	**-0.21**	0.03	-0.02	-0.03	-0.04	0.00	**-0.13**	**-0.10**	-0.03	-0.04	**0.08**	**-0.06**	**0.05**	*1*	-0.02	**0.36**	-0.02
(18)LITIGATION	**0.05**	**0.06**	0.03	-0.04	**-0.06**	**0.09**	0.00	**0.13**	0.01	0.02	-0.04	0.01	**0.08**	0.00	**0.06**	**0.08**	0.00	*1*	0.00	-0.01
(19)PROPRIETARY	**0.13**	-0.01	**-0.09**	**-0.16**	-0.02	**0.10**	-0.03	**0.09**	**0.12**	**-0.20**	**-0.10**	**-0.15**	**0.13**	0.03	**-0.22**	**0.10**	**0.32**	0.01	*1*	**-0.09**
(20)lnHOLDING	**0.05**	**0.11**	**0.40**	0.02	**0.13**	**-0.33**	0.00	**-0.08**	**-0.07**	**0.05**	**0.07**	**0.11**	**-0.28**	**0.17**	**-0.16**	**0.15**	0.00	0.01	**-0.14**	*1*

This table presents the Pearson and Spearman correlation matrix for the main variables used in my analyses for Hypothesis 1 below and above the diagonal respectively. All variables are defined in Appendix 3. The values in bold indicate significant correlation coefficients at better than the 10% level, based on the two-tailed tests.

Table 4. CEO style and risk factor disclosures
Panel A. F-test on CEO fixed effects

		(1)	(2)	(3)	(4)
	Prediction	*lnNUMRF*	*lnNUMRF*	*RFQUALITY*	*RFQUALITY*
SIZE	(-)	0.014	-0.002	-0.026	0.038
		(0.015)	(0.016)	(0.032)	(0.034)
F_AGE	(-)	-0.030	-0.039	-0.054	-0.027
		(0.039)	(0.037)	(0.082)	(0.079)
RET	(-)	-0.009	0.009	0.003	-0.006
		(0.014)	(0.014)	(0.030)	(0.030)
STDRET	(+)	0.365	0.422	-2.784	-0.498
		(0.958)	(0.983)	(2.028)	(2.108)
SKEWRET	(-)	-0.002	-0.005	0.007	0.003
		(0.004)	(0.004)	(0.008)	(0.008)
SH_TURNOVER	(+)	4.630***	5.314***	-3.235	-4.804
		(1.521)	(1.562)	(3.218)	(3.348)
BETA	(+)	-0.062***	-0.046**	0.043	0.023
		(0.020)	(0.021)	(0.043)	(0.044)
LEV	(+)	0.087	-0.004	0.259**	0.306**
		(0.062)	(0.065)	(0.131)	(0.140)
BIG4	(+)	0.107**	0.038	0.075	0.230**
		(0.048)	(0.052)	(0.101)	(0.111)
ETR	(-)	-0.000	0.002	0.016	0.033
		(0.011)	(0.011)	(0.023)	(0.023)
LOSS	(+)	0.025	0.027*	-0.066*	-0.045
		(0.016)	(0.016)	(0.035)	(0.035)
SALES_GROWTH	(+)	0.048	0.050	0.143*	0.092
		(0.036)	(0.036)	(0.077)	(0.076)
BTM	(+)	-0.020	-0.013	0.054	0.074**
		(0.016)	(0.017)	(0.035)	(0.037)
lnANALYSTS	(+)	0.020	0.010	-0.075*	-0.028
		(0.019)	(0.019)	(0.040)	(0.042)
CL_IND	(+)	0.000*	0.000**	0.000	0.000
		(0.000)	(0.000)	(0.000)	(0.000)
LITIGATION	(+)	-0.024	-0.010	0.039	0.014
		(0.027)	(0.027)	(0.057)	(0.057)
PROPRIETARY	(-)	0.185	-0.215	-0.808	-1.020
		(0.353)	(0.369)	(0.748)	(0.790)
lnHOLDING	(-)	0.001	0.002	0.006	0.006
		(0.003)	(0.003)	(0.005)	(0.005)
Firm, Year Fixed Effects		YES	YES	YES	YES
Adjusted R^2(%)		85.3%	87.4%	56.6%	61.7%
Observations		1,376	1,376	1,376	1,376
F-test on CEOs Fixed Effects		**2.84 (<0.001, 118)**			**2.69 (<0.001, 118)**
% of Adjusted R^2(%) change		**2.10%**			**5.10%**

This table reports the regression results for CEO fixed effects on risk factor disclosure, estimated using Model (1). Reported are the F-tests for the joint significance of the CEO fixed effects. For each F-test, I report the value of the F-statistics and, in the parentheses, the associated p-value and number of constraints. Also reported are the percentage point change in adjusted R^2 by including CEO fixed effects to the benchmark model without CEO fixed effects. All variables are defined in Appendix 3. Coefficient standard errors are shown in the parentheses below the coefficient loading. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively, based on the two-tailed tests.

Panel B. Percentage of significant CEO fixed effect estimates

	At the 5% level	At the 10% level
lnNUMRF_coeff	18.64%	27.97%
RFQUALITY_coeff	14.41%	15.25%

This table presents the percentage of significant CEO fixed effect estimates at the 5% and 10% level estimated from the regressions reported in Panel A of Table 3.

Panel C. Distribution of CEO fixed effect estimates

	N	Mean	Q1	Median	Q3	Interquartile
lnNUMRF_coeff	118	0.116	-0.928	0.183	1.060	1.988
RFQUALITY_coeff	118	0.114	-0.570	0.001	0.922	1.491

This table presents the distribution of CEO fixed effects estimated from the regressions reported in Panel A of Table 3. Each fixed effect estimate is weighted by the inverse of its standard error to account for estimation error following Bertrand and Schoar (2003).

Panel D. Robustness tests for the impact of CEO style on risk factor disclosures

	(1) *Res_lnNUMRF* (standard errors)	(2) *Res_RFQUALITY* (standard errors)
Exc_lnNUMRF_coeff	0.018*** (0.003)	
Exc_RFQUALITY_coeff		0.035*** (0.007)

This table presents the coefficient estimates from examining the relation between out of sample residuals and CEO fixed effects. CEO fixed effects are estimated by excluding one year's observations (t) using Model (1) and weighted by the inverse of its standard error (*Exc_lnNUMRF_coeff, Exc_RFQUALITY_coeff*) following Bertrand and Schoar (2003). Out of sample residuals are obtained from the base model for the excluded year (t) (*Res_lnNUMRF, Res_RFQUALITY*).

Table 5. Summary statistics for variables used in testing CEO overconfidence (Hypothesis 2)
Panel A. Descriptive statistics

Variable	N	Mean	Std Dev.	Q1	Median	Q3
Overconfident	18,364	0.232	0.422	0	0	0
lnNUMRF	18,364	3.194	0.450	2.890	3.219	3.497
RFQUALITY	18,364	2.003	0.549	1.667	2	2.333
RFQ_HIGH	18,364	0.100	0.300	0	0	0
RFQ_LOW	18,364	0.050	0.218	0	0	0
CL_RF	17,305	0.048	0.213	0	0	0
SIZE	18,364	7.668	1.638	6.539	7.577	8.752
F_AGE	18,364	28.760	17.005	15	23	41
RET	18,364	0.145	0.495	-0.132	0.095	0.330
STDRET	18,364	0.022	0.012	0.013	0.019	0.026
SKEWRET	18,364	0.262	1.481	-0.336	0.237	0.874
SH_TURNOVER	18,364	0.011	0.007	0.006	0.009	0.013
BETA	18,364	1.050	0.361	0.812	1.021	1.258
LEV	18,364	0.230	0.197	0.058	0.203	0.351
BIG4	18,364	0.908	0.289	1	1	1
ETR	18,364	0.211	0.476	0.131	0.303	0.370
LOSS	18,364	0.178	0.383	0	0	0
SALES_GROWTH	18,364	0.061	0.183	-0.007	0.033	0.119
BTM	18,364	0.549	0.449	0.270	0.458	0.720
ANALYSTS	18,364	13.882	9.707	6	12	20
lnANALYSTS	18,364	2.455	0.766	1.946	2.565	3.045
CL_IND	18,364	75.324	103.392	8	23	107
LITIGATION	18,364	0.026	0.158	0	0	0
PROPRIETARY	18,364	0.031	0.059	0	0	0.034
HOLDING	18,364	46,310.250	120,465.720	4,219.600	12,619.060	35,942.610
lnHOLDING	18,364	9.314	2.026	8.347	9.443	10.490

This table provides descriptive statistics for the main variables used in my analyses for Hypothesis 2. The sample consists of 18,364 observations drawn from the interacton of Compustat, Execucomp, CRSP, Audit Analytics, the Stanford Law School's Securities Class Action Clearinghouse, and I/B/E/S between 2005 and 2018. All variables are defined in Appendix 3.

Panel B. Correlations

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*	*(13)*	*(14)*	*(15)*	*(16)*	*(17)*	*(18)*	*(19)*	*(20)*	*(21)*	*(22)*	*(23)*
(1)lnNUMRF	*1*	**0.06**	0.01	**-0.05**	**-0.02**	**-0.08**	**-0.28**	0.01	**0.15**	-0.01	**0.12**	**0.03**	0.00	**-0.04**	**-0.15**	**0.15**	**-0.01**	**0.03**	**0.01**	**0.25**	**0.07**	**0.12**	**-0.05**
(2)RFQUALITY	**0.04**	*1*	**0.53**	**-0.38**	0.01	**0.11**	**-0.03**	0.00	**-0.03**	-0.01	**0.03**	**0.02**	**0.04**	**0.07**	**-0.05**	**0.02**	**-0.05**	**0.02**	**0.08**	**0.09**	**0.02**	**0.03**	**0.04**
(3)RFQ_HIGH	0.00	**0.60**	*1*	**-0.08**	0.00	**0.01**	**0.02**	-0.01	-0.01	0.00	0.01	**0.02**	0.00	**0.02**	-0.01	**0.02**	**-0.04**	0.01	0.01	**0.04**	-0.01	**0.03**	0.00
(4)RFQ_LOW	**-0.04**	**-0.42**	**-0.08**	*1*	0.01	**-0.05**	**0.05**	0.01	0.01	0.01	**-0.02**	0.00	**-0.02**	**-0.04**	**0.03**	**-0.02**	0.00	0.00	**-0.05**	**-0.07**	-0.01	**-0.02**	-0.01
(5)CL_RF	**-0.02**	0.00	0.00	0.01	*1*	**0.02**	0.00	**-0.04**	**0.05**	0.01	**0.05**	**0.05**	0.01	0.00	0.01	**0.02**	**-0.02**	**0.05**	**0.03**	**0.03**	**0.01**	**-0.03**	0.00
(6)SIZE	**-0.08**	**0.10**	**0.01**	**-0.05**	**0.02**	*1*	**0.31**	**0.17**	**-0.61**	**-0.09**	**0.07**	0.00	**0.21**	**0.31**	**0.06**	**-0.33**	**0.06**	**-0.31**	**0.69**	**-0.06**	**0.04**	**-0.09**	**0.58**
(7)F_AGE	**-0.26**	**-0.02**	0.01	**0.03**	0.00	**0.33**	*1*	**0.02**	**-0.31**	**-0.04**	**-0.14**	0.00	**0.15**	**0.10**	**-0.01**	**-0.07**	**-0.15**	0.00	**0.08**	**-0.18**	-0.01	**-0.05**	**0.07**
(8)RET	**0.03**	0.00	0.00	0.00	**-0.02**	**0.09**	**-0.02**	*1*	**-0.21**	**0.31**	**-0.11**	-0.01	**-0.05**	**0.01**	**0.04**	**-0.17**	**0.08**	**-0.25**	-0.01	0.01	**-0.06**	**0.02**	**0.23**
(9)STDRET	**0.13**	-0.01	-0.01	0.00	**0.06**	**-0.57**	**-0.25**	**-0.07**	*1*	**0.13**	**0.43**	**0.30**	**-0.11**	**-0.17**	**-0.09**	**0.42**	**-0.01**	**0.18**	**-0.26**	**0.05**	**0.08**	**0.14**	**-0.38**
(10)SKEWRET	-0.01	-0.01	0.00	**0.01**	0.01	**-0.06**	**-0.03**	**0.30**	**0.13**	*1*	**-0.02**	**0.07**	**-0.03**	**-0.04**	**-0.02**	**0.05**	0.01	**-0.05**	**-0.09**	**0.01**	**-0.06**	**0.03**	-0.01
(11)SH_TURNOVER	**0.12**	**0.02**	0.01	**-0.03**	**0.05**	0.00	**-0.12**	**-0.03**	**0.42**	0.00	*1*	**0.32**	**0.10**	**0.13**	0.01	**0.10**	**0.08**	**-0.03**	**0.36**	**-0.02**	**0.11**	**0.01**	**0.01**
(12)BETA	**0.03**	**0.02**	**0.01**	-0.01	**0.05**	0.01	-0.01	**0.05**	**0.29**	**0.04**	**0.34**	*1*	**0.02**	**0.05**	**-0.06**	**0.11**	**0.02**	**0.05**	**0.10**	**-0.02**	-0.01	**0.06**	0.00
(13)LEV	**0.03**	**0.04**	0.00	**-0.02**	0.01	**0.14**	**0.11**	**-0.04**	**0.02**	-0.01	**0.11**	**0.05**	*1*	**0.18**	**-0.05**	**0.06**	**-0.11**	**-0.11**	**0.09**	**-0.14**	**0.02**	**-0.24**	**0.08**
(14)BIG4	**-0.04**	**0.07**	**0.02**	**-0.04**	0.00	**0.31**	**0.12**	-0.01	**-0.17**	**-0.03**	**0.09**	**0.06**	**0.15**	*1*	**0.02**	**-0.08**	**-0.01**	**-0.05**	**0.27**	**-0.10**	0.00	**-0.07**	**0.12**
(15)ETR	**-0.08**	**-0.01**	0.00	0.01	0.00	**0.08**	**0.02**	0.00	**-0.11**	-0.01	**-0.03**	**-0.03**	**-0.04**	**0.01**	*1*	**-0.26**	**0.15**	**-0.04**	**0.08**	**-0.19**	-0.01	**-0.21**	**0.11**
(16)LOSS	**0.14**	**0.02**	**0.02**	**-0.02**	**0.02**	**-0.35**	**-0.08**	**-0.09**	**0.48**	**0.03**	**0.16**	**0.12**	**0.09**	**-0.08**	**-0.14**	*1*	**-0.26**	**0.18**	**-0.15**	**0.08**	**0.06**	**0.10**	**-0.31**
(17)SALES_GROWTH	0.01	**-0.03**	**-0.03**	-0.01	**-0.02**	**0.05**	**-0.13**	**0.02**	**-0.07**	0.00	**0.08**	**0.01**	**-0.09**	**-0.02**	**0.04**	**-0.23**	*1*	**-0.27**	**0.06**	**-0.07**	**-0.02**	**0.09**	**0.21**
(18)BTM	**0.05**	**0.02**	0.01	0.00	**0.06**	**-0.31**	**-0.04**	**-0.22**	**0.32**	**-0.02**	**0.06**	**0.08**	**-0.14**	**-0.06**	**-0.02**	**0.25**	**-0.19**	*1*	**-0.20**	**0.03**	0.00	**-0.26**	**-0.34**
(19)lnANALYSTS	**0.03**	**0.08**	0.01	**-0.04**	**0.03**	**0.67**	**0.08**	**-0.04**	**-0.26**	**-0.08**	**0.30**	**0.12**	**0.05**	**0.27**	**0.06**	**-0.16**	**0.06**	**-0.17**	*1*	-0.01	**0.07**	**-0.03**	**0.39**
(20)CL_IND	**0.23**	**0.05**	**0.01**	**-0.05**	**0.02**	**-0.05**	**-0.20**	**0.03**	**0.06**	**0.02**	**-0.03**	**-0.06**	**-0.10**	**-0.10**	**-0.08**	**0.07**	-0.01	**-0.06**	**-0.02**	*1*	**0.02**	**0.28**	**-0.03**
(21)LITIGATION	**0.06**	**0.01**	-0.01	-0.01	**0.01**	**0.04**	-0.01	**-0.05**	**0.09**	**-0.07**	**0.12**	0.00	**0.02**	0.00	0.00	**0.06**	0.00	**0.02**	**0.07**	**0.03**	*1*	**0.02**	0.01
(22)PROPRIETARY	**0.20**	**0.06**	**0.04**	**-0.03**	**-0.02**	**-0.14**	**-0.16**	**0.03**	**0.18**	**0.03**	**0.07**	**0.03**	**-0.21**	**-0.08**	**-0.13**	**0.19**	**0.08**	**-0.19**	-0.01	**0.39**	**0.02**	*1*	**-0.04**
(23)lnHOLDING	**-0.05**	**0.03**	0.00	0.00	-0.01	**0.53**	**0.07**	**0.18**	**-0.39**	0.00	**-0.02**	0.01	**0.04**	**0.12**	**0.08**	**-0.32**	**0.16**	**-0.30**	**0.34**	**-0.02**	0.00	**-0.08**	*1*

This table presents the Pearson and Spearman correlation matrix for the main variables used in my analyses for Hypothesis 2 below and above the diagonal respectively. All variables are defined in Appendix 3. The values in bold indicate significant correlation coefficients at better than the 10% level, based on the two-tailed tests.

Panel C. Univariate tests of the difference in risk factor disclosure quality and firm characteristics between firms with more overconfident CEOs and firms with less overconfident CEOs

	More overconfident CEOs (N=4,253) (1) Mean	Less overconfident CEOs (N=14,111) (2) Mean	Difference (1) - (2)	
lnNUMRF	3.2729	3.1708	0.102	***
NUM_RF	27.896	25.234	2.662	***
RFQUALITY	1.978	2.011	-0.033	***
RFQ_HIGH	0.079	0.106	-0.027	***
RFQ_LOW	0.048	0.051	-0.003	
AVE_NUM_WORDS	214.500	217.600	-3.194	
NUM_NUMERIC	0.006	0.007	-0.001	***
NUM_SPECIFIC	0.029	0.031	-0.002	***
	(N=4,018) (1) Mean	(N=13,287) (2) Mean	(1) - (2)	
CL_RF	0.041	0.050	-0.009	**
SIZE	7.958	7.581	0.377	***
F_AGE	25.950	29.607	-3.657	***
RET	0.168	0.138	0.031	***
STDRET	0.021	0.022	-0.001	***
SKEWRET	0.206	0.279	-0.073	***
SH_TURNOVER	0.012	0.010	0.001	***
BETA	1.075	1.042	0.033	***
LEV	0.220	0.233	-0.013	***
BIG4	0.889	0.914	-0.025	***
ETR	0.237	0.203	0.033	***
LOSS	0.105	0.200	-0.095	***
SALES_GROWTH	0.102	0.049	0.052	***
BTM	0.417	0.588	-0.171	***
lnANALYSTS	2.599	2.411	0.188	***
CL_IND	79.362	74.107	5.255	***
LITIGATION	0.030	0.024	0.006	**
PROPRIETARY	0.034	0.030	0.004	***
lnHOLDING	10.375	8.995	1.381	***

This table presents univariate comparisons of risk factor disclosure quality and firm characteristics between firms with more overconfident CEOs and firms with less overconfident CEOs. All variables are defined in Appendix 3. T-tests are conducted to test for differences in means. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively, based on the two-tailed tests.

Table 6. CEO overconfidence and risk factor disclosures

		(1)	(2)	(3)	(4)
	Prediction	*lnNUMRF*	*RFQUALITY*	*RFQ_HIGH*	*RFQ_LOW*
Overconfident		-0.010*	-0.028***	-0.012*	-0.003
		(0.005)	(0.010)	(0.006)	(0.005)
SIZE	(-)	0.009*	-0.001	-0.006	-0.001
		(0.005)	(0.009)	(0.006)	(0.004)
F_AGE	(-)	0.008	0.009	0.005	0.005
		(0.008)	(0.019)	(0.013)	(0.010)
RET	(-)	-0.000	0.003	0.003	-0.004
		(0.004)	(0.008)	(0.005)	(0.004)
STDRET	(+)	1.818***	1.304**	0.225	-0.418*
		(0.302)	(0.556)	(0.349)	(0.254)
SKEWRET	(-)	-0.000	-0.001	0.002	0.002
		(0.001)	(0.002)	(0.001)	(0.001)
SH_TURNOVER	(+)	2.239***	-1.483*	-0.750	-0.298
		(0.411)	(0.762)	(0.482)	(0.356)
BETA	(+)	-0.027***	0.016	0.000	-0.003
		(0.006)	(0.011)	(0.007)	(0.006)
LEV	(+)	0.066***	-0.063*	-0.046**	0.030*
		(0.021)	(0.035)	(0.022)	(0.017)
BIG4	(+)	0.058***	0.000	0.013	0.013
		(0.015)	(0.025)	(0.015)	(0.012)
ETR	(-)	-0.001	0.002	0.007	0.001
		(0.004)	(0.007)	(0.004)	(0.003)
LOSS	(+)	0.035***	0.008	0.002	-0.005
		(0.005)	(0.010)	(0.007)	(0.005)
SALES_GROWTH	(+)	0.045***	-0.043**	-0.022*	-0.010
		(0.010)	(0.020)	(0.012)	(0.010)
BTM	(+)	0.016**	0.001	0.001	-0.000
		(0.007)	(0.013)	(0.008)	(0.006)
lnANALYSTS	(+)	0.004	0.009	-0.005	-0.016***
		(0.006)	(0.011)	(0.007)	(0.006)
CL_IND	(+)	0.000***	0.000**	0.000***	-0.000**
		(0.000)	(0.000)	(0.000)	(0.000)
LITIGATION	(+)	-0.010	-0.014	-0.009	0.003
		(0.012)	(0.019)	(0.012)	(0.009)
PROPRIETARY	(-)	0.157	0.116	0.207*	-0.004
		(0.099)	(0.164)	(0.113)	(0.060)
lnHOLDING	(-)	-0.004***	0.000	0.001	0.003**
		(0.001)	(0.002)	(0.001)	(0.001)
Firm, Year Fixed Effects		YES	YES	YES	YES
Adjusted R^2 (%)		82.0%	57.6%	44.3%	32.4%
Observations		18,199	18,199	18,199	18,199

This table reports the regression results of the effect of CEO overconfidence on the content of risk factor disclosures, estimated using Model (2). All variables are defined in Appendix 3. Coefficient standard errors (robust standard errors for Column (3) and (4)) are shown in the parentheses below the coefficient loading. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively, based on the two-tailed tests.

Table 7. CEO overconfidence and SEC comment letters
Panel A. Regression analysis

	Prediction	*CL_RF*
Overconfident		0.013**
		(0.006)
SIZE	(-)	-0.002
		(0.005)
F_AGE	(-)	-0.002
		(0.007)
RET	(-)	-0.004
		(0.005)
STDRET	(+)	0.429
		(0.395)
SKEWRET	(-)	0.001
		(0.001)
SH_TURNOVER	(+)	0.548
		(0.495)
BETA	(+)	0.003
		(0.007)
LEV	(+)	0.019
		(0.020)
BIG4	(+)	-0.018
		(0.013)
ETR	(-)	-0.002
		(0.004)
LOSS	(+)	0.002
		(0.007)
SALES_GROWTH	(+)	-0.022*
		(0.013)
BTM	(+)	-0.004
		(0.009)
lnANALYSTS	(+)	-0.009
		(0.007)
CL_IND	(+)	0.000
		(0.000)
LITIGATION	(+)	-0.001
		(0.013)
PROPRIETARY	(-)	0.074
		(0.089)
lnHOLDING_CEO	(-)	0.001
		(0.002)
Firm, Year Fixed Effects		YES
Adjusted R^2 (%)		3.37%
Observations		17,162

Panel B. Path analysis

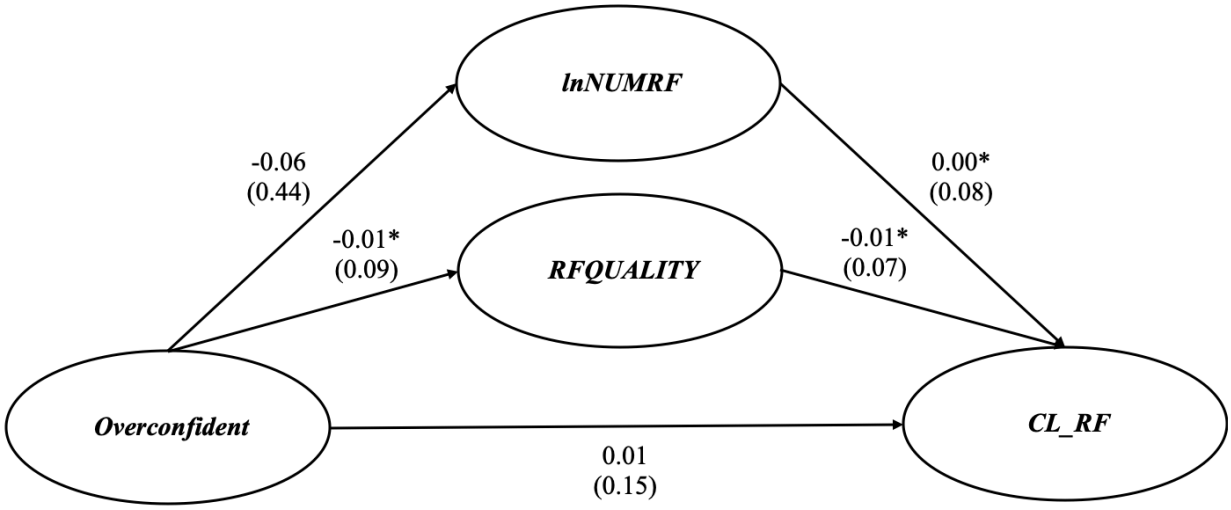


Table 7 reports the results of the effect of CEO overconfidence on receiving SEC comment letters on risk factor disclosures. Panel A reports the regression results, estimated using Model (2). All variables are defined in Appendix 3. Robust standard errors are shown in the parentheses below the coefficient loading. Panel B reports the path analysis results using the mediation procedures in Hayes (2018). The mediating variables, *lnNUMRF* and *RFQUALITY*, as well as the outcome variable, *CL_RF*, are residuals obtained from estimating Model (2) without *Overconfident* so that I can examine the relation between the variables in the path diagram after controlling for the effects of firm inherent risks and reporting incentives. 95% bootstrap confidence intervals are generated using 1,000 bootstrap samples. P-values are shown in the parentheses below the coefficient loading. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively, based on the two-tailed tests.

Table 8. Robustness test for the effect of CEO overconfidence on risk factor disclosures
Panel A: Descriptive statistics for CEO characteristics

	N	N with value = 1	Q1	Median	Mean	Q3
Overconfident	18,364	4,253	0	0	0.232	0
Founder	18,364	1,687	0	0	0.092	0
CPA	18,364	1,718	0	0	0.094	0
MBA	18,364	6,436	0	0	0.350	1
Gender	18,364	669	0	0	0.036	0
Age	18,356		51	56	55.817	60
Dual	18,364	8,446	0	0	0.460	1
Recession	18,364	4,283	0	0	0.233	0

This table provides descriptive statistics for CEOs' characteristics on the sample used for Hypothesis 2. The sample consists of 18,364 observations drawn from the interacton of Compustat, Execucomp, CRSP, Audit Analytics, the Stanford Law School's Securities Class Action Clearinghouse, and I/B/E/S between 2005 and 2018. All variables are defined in Appendix 3.

Panel B. Correlations between CEO characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Overconfident	*1*	**0.15**	**0.02**	**-0.04**	**-0.02**	**0.09**	**0.08**	**-0.04**
(2) Founder	**0.15**	*1*	**-0.06**	**-0.09**	**-0.03**	**0.05**	**0.12**	**-0.02**
(3) CPA	**0.02**	**-0.06**	*1*	**-0.02**	0.00	**-0.05**	0.01	**-0.02**
(4) MBA	**-0.04**	**-0.09**	**-0.02**	*1*	**-0.01**	**-0.05**	**-0.01**	0.00
(5) Gender	**-0.02**	**-0.03**	0.00	**-0.01**	*1*	**-0.05**	**-0.02**	0.00
(6) Age	0.09	**0.08**	**-0.05**	**-0.06**	**-0.04**	*1*	**0.25**	**0.07**
(7) Dual	**0.08**	**0.12**	0.01	**-0.01**	**-0.02**	**0.25**	*1*	**0.05**
(8) Recession	**-0.04**	**-0.02**	**-0.02**	0.00	0.00	**0.06**	**0.05**	*1*

This table presents the Pearson and Spearman correlation matrix for the CEOs' characteristics below and above the diagonal respectively. All variables are defined in Appendix 3. The values in bold indicate significant correlation coefficients at better than the 10% level, based on the two-tailed tests.

Panel C. CEO characteristics and risk factor disclosures

	(1)	(2)	(3)	(4)	(5)
	lnNUMRF	*RFQUALITY*	*RFQ_HIGH*	*RFQ_LOW*	*CL_RF*
Overconfident	-0.010*	-0.024**	-0.012*	-0.005	0.013**
	(0.006)	(0.011)	(0.007)	(0.005)	(0.006)
Founder	0.039***	-0.025	-0.026*	-0.000	-0.015
	(0.012)	(0.024)	(0.016)	(0.010)	(0.012)
CPA	0.008	-0.021	0.001	-0.004	-0.002
	(0.010)	(0.020)	(0.011)	(0.011)	(0.010)
MBA	-0.016**	-0.032***	-0.010	0.009	-0.000
	(0.007)	(0.011)	(0.007)	(0.006)	(0.007)
Gender	-0.010	0.037	0.032**	0.000	-0.011
	(0.015)	(0.024)	(0.016)	(0.014)	(0.012)
Age	0.000	-0.001*	-0.000	0.001**	0.000
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Dual	-0.014***	0.010	0.014**	-0.002	-0.007
	(0.005)	(0.010)	(0.006)	(0.005)	(0.006)
Recession	0.003	0.033**	0.010	-0.004	-0.001
	(0.007)	(0.013)	(0.008)	(0.006)	(0.008)
SIZE	0.009*	-0.003	-0.007	-0.001	-0.002
	(0.005)	(0.009)	(0.006)	(0.004)	(0.005)
F_AGE	0.009	0.007	0.004	0.006	-0.002
	(0.008)	(0.019)	(0.012)	(0.010)	(0.007)
RET	0.000	0.003	0.003	-0.004	-0.004
	(0.004)	(0.008)	(0.005)	(0.004)	(0.005)
STDRET	1.795***	1.306**	0.245	-0.409	0.421
	(0.302)	(0.556)	(0.349)	(0.253)	(0.395)
SKEWRET	-0.000	-0.001	0.001	0.002	0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
SH_TURNOVER	2.272***	-1.430*	-0.763	-0.313	0.564
	(0.413)	(0.762)	(0.483)	(0.356)	(0.494)
BETA	-0.026***	0.015	-0.000	-0.003	0.003
	(0.006)	(0.011)	(0.007)	(0.006)	(0.007)
LEV	0.067***	-0.064*	-0.047**	0.029*	0.020
	(0.021)	(0.035)	(0.022)	(0.017)	(0.020)
BIG4	0.059***	-0.001	0.012	0.013	-0.018
	(0.015)	(0.026)	(0.015)	(0.012)	(0.014)
ETR	-0.001	0.002	0.007	0.001	-0.002
	(0.004)	(0.007)	(0.004)	(0.003)	(0.004)
LOSS	0.035***	0.008	0.002	-0.005	0.002
	(0.005)	(0.010)	(0.007)	(0.005)	(0.007)
SALES_GROWTH	0.045***	-0.044**	-0.022*	-0.009	-0.022*
	(0.010)	(0.020)	(0.012)	(0.010)	(0.013)
BTM	0.017**	-0.000	-0.000	-0.001	-0.004
	(0.007)	(0.013)	(0.008)	(0.006)	(0.009)
lnANALYSTS	0.004	0.007	-0.004	-0.015***	-0.008

	(0.006)	(0.011)	(0.007)	(0.006)	(0.007)
CL_IND	0.000***	0.000*	0.000***	-0.000**	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LITIGATION	-0.010	-0.014	-0.009	0.003	-0.001
	(0.012)	(0.019)	(0.012)	(0.009)	(0.013)
PROPRIETARY	0.161	0.114	0.202*	-0.002	0.075
	(0.099)	(0.163)	(0.113)	(0.060)	(0.090)
lnHOLDING	-0.004***	0.001	0.001	0.002*	0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Firm, Year Fixed Effects	YES	YES	YES	YES	YES
Adjusted R^2 (%)	82.0%	57.7%	44.4%	32.3%	3.4%
Observations	18,191	18,191	18,191	18,191	17,153

This table reports the regression results of the effect of CEOs' characteristics on the content of risk factor disclosures. I add CEOs' characteristic variables to Model (2) for estimation. All variables are defined in Appendix 3. Coefficient standard errors (robust standard errors for Column (3), (4), and (5)) are shown in the parentheses below the coefficient loading. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively, based on the two-tailed tests.

Table 9. Change analysis

	absch(NUM_RF)	*absch(lnNUMRF)*	*absch(RFQUALITY)*	*absch(CL_RF)*
change_CEO	0.415***	0.015***	-0.002	0.017**
	(0.108)	(0.004)	(0.007)	(0.009)
ch_SIZE	0.134	-0.003	-0.016**	-0.033***
	(0.116)	(0.004)	(0.008)	(0.009)
ch_F_AGE	0.013	0.019***	0.031**	-0.119***
	(0.192)	(0.006)	(0.015)	(0.023)
ch_RET	0.036	0.003*	0.002	0.009**
	(0.048)	(0.002)	(0.004)	(0.004)
ch_STDRET	18.057***	0.711***	-0.011	0.017
	(4.792)	(0.172)	(0.328)	(0.414)
ch_SKEWRET	0.044***	0.001**	0.003**	0.012***
	(0.015)	(0.001)	(0.001)	(0.001)
ch_SH_TURNOVER	26.185***	1.248***	1.240**	1.849**
	(7.811)	(0.283)	(0.611)	(0.723)
ch_BETA	-0.191**	-0.010***	-0.003	-0.023***
	(0.089)	(0.003)	(0.007)	(0.008)
ch_LEV	1.973***	0.053***	0.040	-0.108***
	(0.534)	(0.019)	(0.033)	(0.037)
ch_BIG4	0.598*	0.010	0.021	-0.020
	(0.312)	(0.010)	(0.023)	(0.023)
ch_ETR	0.019	0.000	-0.000	0.000
	(0.049)	(0.002)	(0.003)	(0.004)
ch_LOSS	0.507***	0.011***	0.016**	0.039***
	(0.082)	(0.003)	(0.006)	(0.008)
ch_SALES_GROWTH	0.121	0.004	0.007	0.010
	(0.133)	(0.005)	(0.012)	(0.013)
ch_BTM	0.309**	0.014***	-0.004	0.004
	(0.147)	(0.005)	(0.010)	(0.012)
ch_NUM_ANALYSTS	0.000	0.000	0.000	-0.001
	(0.012)	(0.000)	(0.001)	(0.001)
ch_CL_IND	0.003**	0.000**	0.000	-0.001***
	(0.001)	(0.000)	(0.000)	(0.000)
ch_LITIGATION	0.413**	0.006	-0.001	0.003
	(0.171)	(0.006)	(0.015)	(0.017)
ch_PROPRIETARY	-3.335	-0.020	-0.075	-0.074
	(2.258)	(0.074)	(0.153)	(0.159)
ch_HOLDING	0.000	-0.000	-0.000	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	1.826***	0.064***	0.193***	0.253***
	(0.252)	(0.008)	(0.021)	(0.028)
Adjusted R^2(%)	1.07%	1.17%	9.75%	1.57%
Observations	19,926	19,926	19,926	19,926

This table reports the regression results of the effect of a change in CEO on the change in the content of risk factor disclosures. All variables take the change form and dependent variables are measured in absolute terms. Robust standard errors are shown in the parentheses below the coefficient loading. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively, based on the two-tailed tests.

Table 10. Role of auditors
Panel A. CEO style

	(1) *lnNUMRF*	(2) *lnNUMRF*	(3) *RFQUALITY*	(4) *RFQUALITY*
SIZE	0.013	-0.000	-0.018	0.045
	(0.015)	(0.016)	(0.032)	(0.034)
F_AGE	-0.029	-0.037	-0.050	-0.026
	(0.038)	(0.037)	(0.082)	(0.079)
RET	-0.004	0.011	-0.000	-0.009
	(0.014)	(0.014)	(0.030)	(0.030)
STDRET	0.153	0.417	-2.096	0.072
	(0.960)	(0.986)	(2.044)	(2.121)
SKEWRET	-0.003	-0.005	0.008	0.004
	(0.004)	(0.004)	(0.008)	(0.008)
SH_TURNOVER	4.433***	5.165***	-3.755	-5.268
	(1.517)	(1.559)	(3.228)	(3.355)
BETA	-0.060***	-0.041**	0.055	0.031
	(0.020)	(0.021)	(0.043)	(0.045)
LEV	0.086	0.004	0.286**	0.318**
	(0.062)	(0.066)	(0.131)	(0.141)
ETR	-0.001	0.002	0.017	0.034
	(0.011)	(0.010)	(0.022)	(0.023)
LOSS	0.020	0.024	-0.062*	-0.041
	(0.016)	(0.016)	(0.035)	(0.035)
SALES_GROWTH	0.056	0.056	0.139*	0.091
	(0.036)	(0.036)	(0.077)	(0.077)
BTM	-0.018	-0.013	0.053	0.082**
	(0.016)	(0.017)	(0.035)	(0.038)
lnANALYSTS	0.020	0.011	-0.071*	-0.034
	(0.019)	(0.020)	(0.040)	(0.042)
CL_IND	0.000	0.000**	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
LITIGATION	-0.026	-0.010	0.047	0.021
	(0.027)	(0.026)	(0.057)	(0.057)
PROPRIETARY	0.142	-0.269	-0.813	-0.965
	(0.354)	(0.372)	(0.753)	(0.801)
lnHOLDING	0.000	0.002	0.006	0.006
	(0.003)	(0.003)	(0.005)	(0.006)
Firm, Auditor, Year Fixed Effects	YES	YES	YES	YES
Adjusted R^2(%)	85.5%	87.5%	56.7%	61.8%
Observations	1,376	1,376	1,376	1,376
F-test on CEOs Fixed Effects		**2.84 (<0.001, 118)**		**2.62 (<0.001, 118)**
% of Adjusted R^2(%) change		**2.00%**		**5.10%**

This table reports the regression results for CEO fixed effects on risk factor disclosure, after controlling for the time-invariant auditor effects. I include auditor fixed effects in place of *Big4* to Model (1) for estimation. Reported are the F-tests for the joint significance of the CEO fixed effects. For each F-test, I report the value of the F-statistics and, in the parentheses, the associated p-value and number of constraints. Also reported are the percentage point change in adjusted R^2 by including CEO fixed effects to the benchmark model without CEO fixed effects. All variables are defined in Appendix 3. Coefficient standard errors are shown in the parentheses below the coefficient loading. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively, based on the two-tailed tests.

Panel B. CEO overconfidence

	lnNUMRF	*RFQUALITY*	*RFQ_HIGH*	*RFQ_LOW*	*CL_RF*
Overconfident	-0.010*	-0.027***	-0.012*	-0.004	0.014**
	(0.005)	(0.010)	(0.006)	(0.005)	(0.006)
SIZE	0.008*	-0.003	-0.005	-0.001	-0.002
	(0.005)	(0.008)	(0.006)	(0.005)	(0.005)
F_AGE	0.008	0.010	0.005	0.005	-0.002
	(0.009)	(0.017)	(0.013)	(0.010)	(0.007)
RET	-0.000	0.002	0.003	-0.004	-0.004
	(0.004)	(0.008)	(0.005)	(0.004)	(0.005)
STDRET	1.849***	1.229**	0.179	-0.409	0.413
	(0.281)	(0.527)	(0.347)	(0.254)	(0.396)
SKEWRET	-0.000	-0.001	0.002	0.002	0.000
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
SH_TURNOVER	2.161***	-1.488**	-0.713	-0.289	0.588
	(0.387)	(0.727)	(0.482)	(0.356)	(0.495)
BETA	-0.028***	0.015	0.001	-0.002	0.004
	(0.006)	(0.011)	(0.007)	(0.006)	(0.007)
LEV	0.066***	-0.064*	-0.046**	0.030*	0.018
	(0.018)	(0.034)	(0.022)	(0.017)	(0.020)
ETR	-0.001	0.002	0.007	0.002	-0.002
	(0.003)	(0.006)	(0.004)	(0.003)	(0.004)
LOSS	0.035***	0.008	0.002	-0.005	0.002
	(0.005)	(0.010)	(0.007)	(0.005)	(0.007)
SALES_GROWTH	0.046***	-0.044**	-0.022*	-0.010	-0.022*
	(0.010)	(0.019)	(0.012)	(0.010)	(0.013)
BTM	0.016**	0.000	0.001	-0.000	-0.004
	(0.006)	(0.012)	(0.008)	(0.006)	(0.009)
lnANALYSTS	0.003	0.007	-0.004	-0.014**	-0.009
	(0.006)	(0.011)	(0.007)	(0.006)	(0.007)
CL_IND	0.000***	0.000**	0.000***	-0.000**	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LITIGATION	-0.011	-0.014	-0.008	0.003	-0.001
	(0.010)	(0.019)	(0.012)	(0.009)	(0.013)
PROPRIETARY	0.168**	0.120	0.201*	-0.007	0.074
	(0.081)	(0.153)	(0.113)	(0.060)	(0.089)
lnHOLDING	-0.004***	0.000	0.002	0.003**	0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Firm, Auditor, Year Fixed Effects	YES	YES	YES	YES	YES
Adjusted R^2(%)	82.0%	57.7%	44.4%	32.5%	3.4%
Observations	18,196	18,196	18,196	18,196	17,159

This table reports the regression results of the effect of CEO overconfidence on the content of risk factor disclosures, after controlling for the time-invariant auditor effect. I include auditor fixed effects in place of *Big4* to Model (2) for estimation. All variables are defined in Appendix 3. Coefficient standard errors (robust standard errors when the dependent variable is *RFQ_HIGH*, *RFQ_LOW*, or *CL_RF*) are shown in the parentheses below the coefficient loading. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively, based on the two-tailed tests.

Table 11. Role of general counsels
Panel A. CEO style

	(1) *lnNUMRF*	(2) *lnNUMRF*	(3) *RFQUALITY*	(4) *RFQUALITY*
GeneralCounsel	0.009	0.001	0.024	0.025
	(0.014)	(0.015)	(0.030)	(0.033)
SIZE	0.015	-0.002	-0.025	0.038
	(0.015)	(0.016)	(0.032)	(0.034)
F_AGE	-0.030	-0.039	-0.053	-0.024
	(0.039)	(0.037)	(0.082)	(0.079)
RET	-0.009	0.009	0.003	-0.006
	(0.014)	(0.014)	(0.030)	(0.030)
STDRET	0.340	0.417	-2.851	-0.593
	(0.959)	(0.986)	(2.030)	(2.112)
SKEWRET	-0.002	-0.005	0.007	0.003
	(0.004)	(0.004)	(0.008)	(0.008)
SH_TURNOVER	4.662***	5.322***	-3.147	-4.610
	(1.522)	(1.567)	(3.220)	(3.358)
BETA	-0.062***	-0.046**	0.044	0.024
	(0.020)	(0.021)	(0.043)	(0.044)
LEV	0.087	-0.004	0.259**	0.306**
	(0.062)	(0.065)	(0.131)	(0.140)
BIG4	0.108**	0.039	0.077	0.233**
	(0.048)	(0.052)	(0.101)	(0.111)
ETR	-0.001	0.002	0.016	0.033
	(0.011)	(0.011)	(0.023)	(0.023)
LOSS	0.024	0.027*	-0.066*	-0.046
	(0.016)	(0.016)	(0.035)	(0.035)
SALES_GROWTH	0.048	0.050	0.143*	0.092
	(0.036)	(0.036)	(0.077)	(0.076)
BTM	-0.020	-0.013	0.055	0.075**
	(0.016)	(0.017)	(0.035)	(0.037)
lnANALYSTS	0.019	0.010	-0.077*	-0.029
	(0.019)	(0.019)	(0.040)	(0.042)
CL_IND	0.000*	0.000**	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
LITIGATION	-0.023	-0.010	0.040	0.015
	(0.027)	(0.027)	(0.057)	(0.057)
PROPRIETARY	0.196	-0.214	-0.777	-1.001
	(0.354)	(0.369)	(0.749)	(0.791)
lnHOLDING	0.001	0.002	0.006	0.006
	(0.003)	(0.003)	(0.005)	(0.005)
Firm, Year Fixed Effects	YES	YES	YES	YES
Adjusted R^2(%)	85.3%	87.3%	56.6%	61.7%
Observations	1,376	1,376	1,376	1,376
F-test on CEOs Fixed Effects		**2.83 (<0.001, 118)**		**2.67 (<0.001, 118)**
% of Adjusted R^2(%) change		**2.00%**		**5.10%**

This table reports the regression results for CEO fixed effects on risk factor disclosure, after controlling for the existence of general counsel in the top management team. I add *GeneralCounsel* to Model (1) for estimation. Reported are the F-tests for the joint significance of the CEO fixed effects. For each F-test, I report the value of the F-statistics and, in the parentheses, the associated p-value and number of constraints. Also reported are the percentage point change in adjusted R^2 by including CEO fixed effects to the benchmark model without CEO fixed effects. All other variables are defined in Appendix 3. Coefficient standard errors are shown in the parentheses below the coefficient loading. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively, based on the two-tailed tests.

Panel B. CEO overconfidence

	lnNUMRF	*RFQUALITY*	*RFQ_HIGH*	*RFQ_LOW*	*CL_RF*
Overconfident	-0.010*	-0.028***	-0.012*	-0.003	0.013**
	(0.005)	(0.010)	(0.006)	(0.005)	(0.006)
GeneralCounsel	0.016***	-0.014*	-0.002	0.001	0.004
	(0.004)	(0.008)	(0.005)	(0.004)	(0.005)
SIZE	0.009*	-0.002	-0.006	-0.001	-0.002
	(0.005)	(0.008)	(0.006)	(0.004)	(0.005)
F_AGE	0.008	0.009	0.005	0.005	-0.002
	(0.009)	(0.017)	(0.013)	(0.010)	(0.007)
RET	-0.000	0.003	0.003	-0.004	-0.004
	(0.004)	(0.008)	(0.005)	(0.004)	(0.005)
STDRET	1.830***	1.293**	0.224	-0.416	0.431
	(0.281)	(0.527)	(0.349)	(0.254)	(0.395)
SKEWRET	-0.000	-0.001	0.002	0.002	0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
SH_TURNOVER	2.210***	-1.456**	-0.747	-0.301	0.541
	(0.387)	(0.727)	(0.482)	(0.356)	(0.495)
BETA	-0.027***	0.016	0.000	-0.003	0.003
	(0.006)	(0.011)	(0.007)	(0.006)	(0.007)
LEV	0.067***	-0.064*	-0.046**	0.030*	0.020
	(0.018)	(0.034)	(0.022)	(0.017)	(0.020)
BIG4	0.057***	0.001	0.013	0.013	-0.018
	(0.013)	(0.024)	(0.015)	(0.012)	(0.013)
ETR	-0.001	0.002	0.007	0.001	-0.002
	(0.003)	(0.006)	(0.004)	(0.003)	(0.004)
LOSS	0.035***	0.008	0.002	-0.005	0.002
	(0.005)	(0.010)	(0.007)	(0.005)	(0.007)
SALES_GROWTH	0.046***	-0.044**	-0.022*	-0.009	-0.022*
	(0.010)	(0.019)	(0.012)	(0.010)	(0.013)
BTM	0.016***	0.001	0.001	-0.001	-0.004
	(0.006)	(0.012)	(0.008)	(0.006)	(0.009)
lnANALYSTS	0.004	0.009	-0.005	-0.016***	-0.008
	(0.006)	(0.011)	(0.007)	(0.006)	(0.007)
CL_IND	0.000***	0.000**	0.000***	-0.000**	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LITIGATION	-0.010	-0.014	-0.009	0.003	-0.001
	(0.010)	(0.019)	(0.012)	(0.009)	(0.013)
PROPRIETARY	0.162**	0.112	0.206*	-0.003	0.075
	(0.081)	(0.153)	(0.113)	(0.060)	(0.089)
lnHOLDING	-0.004***	-0.000	0.001	0.003**	0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Firm, Year Fixed Effects	YES	YES	YES	YES	YES
Adjusted R^2(%)	82.0%	57.6%	44.3%	32.3%	3.4%
Observations	18,199	18,199	18,199	18,199	17,162

This table reports the regression results of the effect of CEO overconfidence on the content of risk factor disclosures, after controlling for the existence of general counsel in the top management team. I add *GeneralCounsel* to Model (2) for estimation. All other variables are defined in Appendix 3. Coefficient standard errors (robust standard errors when the dependent variable is *RFQ_HIGH*, *RFQ_LOW*, or *CL_RF*) are shown in the parentheses below the coefficient loading. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively, based on the two-tailed tests.

Table 12. Powerful CEOs

	lnNUMRF	*RFQUALITY*	*RFQ_HIGH*	*RFQ_LOW*	*CL_RF*
Overconfident	-0.001	-0.033**	-0.021**	-0.016**	0.018**
	(0.008)	(0.014)	(0.009)	(0.007)	(0.009)
Power	0.003	-0.007	-0.002	-0.001	0.002
	(0.003)	(0.006)	(0.004)	(0.003)	(0.004)
*Overconfident*Power*	-0.009*	0.008	0.010	0.012**	-0.005
	(0.006)	(0.011)	(0.007)	(0.005)	(0.006)
SIZE	0.009*	-0.003	-0.005	-0.000	-0.003
	(0.005)	(0.009)	(0.006)	(0.005)	(0.005)
F_AGE	0.009	0.010	0.004	0.005	-0.002
	(0.009)	(0.017)	(0.013)	(0.010)	(0.007)
RET	0.001	0.003	0.002	-0.005	-0.003
	(0.004)	(0.008)	(0.005)	(0.004)	(0.005)
STDRET	1.840***	1.325**	0.306	-0.398	0.456
	(0.283)	(0.530)	(0.352)	(0.254)	(0.399)
SKEWRET	-0.000	-0.001	0.002	0.002	0.000
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
SH_TURNOVER	2.389***	-1.433*	-0.799	-0.310	0.642
	(0.392)	(0.733)	(0.486)	(0.360)	(0.499)
BETA	-0.028***	0.016	0.001	-0.004	0.005
	(0.006)	(0.011)	(0.007)	(0.006)	(0.007)
LEV	0.064***	-0.059*	-0.039*	0.030*	0.012
	(0.018)	(0.034)	(0.022)	(0.017)	(0.020)
BIG4	0.060***	-0.007	0.009	0.016	-0.017
	(0.013)	(0.024)	(0.015)	(0.012)	(0.014)
ETR	-0.001	0.002	0.006	0.001	-0.002
	(0.003)	(0.006)	(0.004)	(0.003)	(0.004)
LOSS	0.034***	0.011	0.001	-0.006	0.002
	(0.005)	(0.010)	(0.007)	(0.005)	(0.007)
SALES_GROWTH	0.045***	-0.042**	-0.023*	-0.010	-0.024*
	(0.010)	(0.019)	(0.012)	(0.010)	(0.013)
BTM	0.017***	0.002	0.003	-0.002	-0.005
	(0.006)	(0.012)	(0.008)	(0.006)	(0.009)
lnANALYSTS	0.003	0.007	-0.005	-0.015**	-0.006
	(0.006)	(0.011)	(0.007)	(0.006)	(0.007)
CL_IND	0.000***	0.000**	0.000**	-0.000**	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LITIGATION	-0.008	-0.013	-0.005	0.005	-0.002
	(0.010)	(0.019)	(0.012)	(0.009)	(0.013)
PROPRIETARY	0.155*	0.125	0.222*	0.005	0.078
	(0.082)	(0.153)	(0.114)	(0.060)	(0.089)
lnHOLDING	-0.005***	0.001	0.002	0.003**	0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Firm, Year Fixed Effects	YES	YES	YES	YES	YES
Adjusted R^2 (%)	81.9%	57.7%	44.5%	32.4%	3.33%
Observations	17,978	17,978	17,978	17,978	16,951

This table reports the regression results of the effect of CEO overconfidence and CEO power on the content of risk factor disclosures. I add *Power* and an interaction term with *Overconfident* to Model (2) for estimation. All other variables are defined in Appendix 3. Coefficient standard errors (robust standard errors when the dependent variable is *RFQ_HIGH*, *RFQ_LOW*, or *CL_RF*) are shown in the parentheses below the coefficient loading. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively, based on the two-tailed tests.

Table 13. Overconfidence classification

	lnNUMRF	*RFQUALITY*	*RFQ_HIGH*	*RFQ_LOW*	*CL_RF*
Overconfident_stable	0.008	-0.029**	-0.011	-0.004	0.005
	(0.006)	(0.012)	(0.008)	(0.007)	(0.007)
SIZE	0.007	-0.005	-0.007	-0.002	-0.000
	(0.004)	(0.008)	(0.006)	(0.004)	(0.005)
F_AGE	0.008	0.009	0.005	0.005	-0.002
	(0.009)	(0.017)	(0.013)	(0.010)	(0.007)
RET	0.001	0.005	0.004	-0.004	-0.005
	(0.004)	(0.008)	(0.005)	(0.004)	(0.005)
STDRET	1.795***	1.276**	0.212	-0.421*	0.449
	(0.281)	(0.527)	(0.349)	(0.253)	(0.395)
SKEWRET	-0.000	-0.001	0.002	0.002	0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
SH_TURNOVER	2.235***	-1.503**	-0.759	-0.301	0.552
	(0.387)	(0.727)	(0.482)	(0.356)	(0.495)
BETA	-0.027***	0.016	0.000	-0.003	0.003
	(0.006)	(0.011)	(0.007)	(0.006)	(0.007)
LEV	0.066***	-0.066*	-0.047**	0.029*	0.020
	(0.018)	(0.034)	(0.022)	(0.017)	(0.020)
BIG4	0.058***	-0.001	0.013	0.012	-0.018
	(0.013)	(0.024)	(0.015)	(0.012)	(0.013)
ETR	-0.001	0.002	0.007	0.001	-0.002
	(0.003)	(0.006)	(0.004)	(0.003)	(0.004)
LOSS	0.035***	0.008	0.002	-0.005	0.002
	(0.005)	(0.010)	(0.007)	(0.005)	(0.007)
SALES_GROWTH	0.045***	-0.041**	-0.021*	-0.009	-0.023*
	(0.010)	(0.019)	(0.012)	(0.010)	(0.013)
BTM	0.017***	-0.000	0.000	-0.001	-0.004
	(0.006)	(0.012)	(0.008)	(0.006)	(0.009)
lnANALYSTS	0.004	0.008	-0.005	-0.016***	-0.008
	(0.006)	(0.011)	(0.007)	(0.006)	(0.007)
CL_IND	0.000***	0.000**	0.000***	-0.000**	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LITIGATION	-0.010	-0.015	-0.009	0.003	-0.001
	(0.010)	(0.019)	(0.012)	(0.009)	(0.013)
PROPRIETARY	0.158*	0.122	0.209*	-0.003	0.072
	(0.081)	(0.153)	(0.113)	(0.060)	(0.089)
lnHOLDING	-0.005***	-0.000	0.001	0.003**	0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Firm, Year Fixed Effects	YES	YES	YES	YES	YES
Adjusted R^2(%)	82.0%	57.6%	44.3%	32.4%	3.3%
Observations	18,199	18,199	18,199	18,199	17,162

This table reports the regression results of the effect of CEO overconfidence on the content of risk factor disclosures when overconfidence is measured as a stable trait. *Overconfident_stable* is an indicator equal to 1 for the entire sample period if a CEO holds 100% moneyness options twice during the sample period, and 0 otherwise. All other variables are defined in Appendix 3. Coefficient standard errors (robust standard errors when the dependent variable is *RFQ_HIGH*, *RFQ_LOW*, or *CL_RF*) are shown in the parentheses below the coefficient loading. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively, based on the two-tailed tests.

Table 14. CEO and CFO overconfidence on risk factor disclosures

	lnNUMRF	*RFQUALITY*	*RFQ_HIGH*	*RFQ_LOW*	*CL_RF*
BOTH_OC	-0.003	-0.007	-0.018*	-0.004	0.025***
	(0.008)	(0.015)	(0.009)	(0.007)	(0.009)
ONLY_CEO_OC	-0.012*	-0.041***	-0.004	-0.005	0.010
	(0.007)	(0.013)	(0.008)	(0.006)	(0.008)
ONLY_CFO_OC	-0.022**	0.003	0.004	-0.002	-0.005
	(0.009)	(0.018)	(0.011)	(0.009)	(0.010)
SIZE	0.016***	-0.019**	-0.011*	0.006	-0.003
	(0.005)	(0.009)	(0.007)	(0.005)	(0.006)
F_AGE	0.012	0.013	0.006	0.007	-0.007
	(0.009)	(0.018)	(0.014)	(0.011)	(0.007)
RET	-0.001	0.013	0.007	-0.008*	-0.004
	(0.004)	(0.008)	(0.006)	(0.005)	(0.006)
STDRET	1.774***	1.148**	0.241	-0.323	0.477
	(0.299)	(0.566)	(0.379)	(0.285)	(0.437)
SKEWRET	0.000	-0.004	0.001	0.003**	0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
SH_TURNOVER	1.978***	-1.384*	-0.886*	-0.109	0.346
	(0.416)	(0.789)	(0.519)	(0.396)	(0.560)
BETA	-0.020***	0.011	-0.008	-0.002	0.006
	(0.006)	(0.012)	(0.008)	(0.006)	(0.008)
LEV	0.064***	-0.068*	-0.060**	0.030	0.017
	(0.019)	(0.037)	(0.024)	(0.019)	(0.023)
BIG4	0.070***	0.014	0.036**	0.011	-0.010
	(0.014)	(0.027)	(0.017)	(0.013)	(0.016)
ETR	-0.000	0.003	0.007	0.002	-0.002
	(0.003)	(0.007)	(0.005)	(0.003)	(0.005)
LOSS	0.030***	0.012	0.002	-0.003	0.005
	(0.006)	(0.011)	(0.007)	(0.005)	(0.007)
SALES_GROWTH	0.051***	-0.055***	-0.021	-0.012	-0.009
	(0.011)	(0.021)	(0.014)	(0.011)	(0.015)
BTM	0.023***	-0.016	-0.007	0.004	-0.007
	(0.007)	(0.013)	(0.008)	(0.007)	(0.010)
lnANALYSTS	-0.004	0.011	-0.002	-0.020***	-0.008
	(0.006)	(0.012)	(0.008)	(0.006)	(0.008)
CL_IND	0.000***	0.000	0.000***	-0.000**	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LITIGATION	-0.018*	-0.009	-0.005	-0.002	-0.007
	(0.011)	(0.020)	(0.014)	(0.009)	(0.015)
PROPRIETARY	0.149*	0.160	0.234*	0.066	0.075
	(0.090)	(0.171)	(0.127)	(0.071)	(0.113)
lnHOLDING_CEO	-0.005***	-0.001	0.001	0.003***	0.001
	(0.001)	(0.003)	(0.002)	(0.001)	(0.002)
lnHOLDING_CFO	-0.000	0.002	-0.000	0.000	-0.002
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Firm, Year Fixed Effects	YES	YES	YES	YES	YES
Adjusted R^2(%)	82.8%	60.0%	46.6%	34.9%	4.2%
Observations	15,079	15,079	15,079	15,079	14,233

This table reports the regression results of the effect of CEO and CFO overconfidence on the content of risk factor disclosures, estimated using Model (2). All variables are defined in Appendix 3. Coefficient standard errors (robust standard errors for *RFQ_HIGH*, *RFQ_LOW*, and *CL_RF*) are shown in the parentheses below the coefficient loading. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively, based on the two-tailed tests.