CEO EXTRAVERSION AND MANAGEMENT EARNINGS FORECASTS

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ABSTRACT

This study investigates the effects of CEO extraversion, the single most salient personality trait (Cain 2012), on management earnings forecasts. An extraverted individual is characterized as being energetic, talkative, assertive, decisive and sociable (Wilt and Revelle 2009). I examine whether and how CEO extraversion influences the likelihood of issuing management earnings forecasts and the bias of issued forecasts. I also explore how CEO extraversion interacts with two industry-level determinants of voluntary disclosure in management earnings forecasting decisions. I find that extraverted CEOs are more likely to issue earnings forecasts. In addition, extraverted CEOs issue less upward biased forecasts and are less likely to miss their own forecasts. Furthermore, I document that the impact of CEO extraversion on the issuance and bias of management earnings forecasts is attenuated when a firm faces high proprietary cost or high litigation risk of voluntary disclosure. My results are robust to the control for potential endogeneity issues. Analyzing the stock market reaction to management forecasts, I also show that increases in CEO extraversion are associated with stronger stock market reaction to news conveyed in management forecasts. My study adds to the management forecast literature by providing direct evidence on the strong effects of CEO extraversion on management earnings forecasts. My study also extends the Upper Echelons Theory (Hambrick and Mason 1984;

Hambrick 2007) by showing that management forecasting, a complex and important corporate decision, reflects the personalities of top managers.

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CHAPTER 1
INTRODUCTION

In this study, I investigate the effects of CEO extraversion, arguably the single most important personality trait (Cain 2012), on management earnings forecasting behavior. Extraverted individuals are characterized as being energetic, talkative, assertive, decisive and sociable (Wilt and Revelle 2009). I examine whether and how CEO extraversion influences the likelihood of issuing management earnings forecasts and the bias of issued forecasts. I also explore how CEO extraversion interacts with two important industry-level determinants of management earnings forecasts.

Management earnings forecasts are key voluntary disclosures that managers utilize to establish or change market expectations of earnings, preempt litigation concerns, and build up their reputation for transparent reporting (Hirst, Koonce, and Venkataraman 2008; Healy and Palepu 2001). Management earnings forecasts are important information sources for investors in the capital market. For example, Beyer, Cohen, Lys and Walther (2010) provide evidence that management earnings forecasts provide about 55% of the accounting-based information on average. Furthermore, the three-day stock returns centered on the management earnings forecast announcement date account for about 15.67% of the quarterly stock return variance (Beyer et al. 2010).

Prior research on the determinants of issuance and characteristics of management earnings forecasts focuses primarily on the economic incentives and legal factors at the

market, industry, and firm levels, where individual managers are treated as representative and interchangeable agents (see Hirst et al. 2008 for a review). However, Bertrand and Schoar (2003) show that individual managers are not interchangeable and that manger fixed effects exist in a wide range of corporate decisions such as investing and financing. Furthermore, Bamber, Jiang and Wang (2010) show that top managers impose significant individual-specific influence on management forecasting decisions under the framework of the Upper Echelons Theory (Hambrick 2007; Hambrick and Mason 1984).

Bamber et al. (2010) then link their findings of manager fixed effects on management forecasts to observable demographic characteristics of managers, such as birth cohort, education, work experience and military experience. However, as acknowledged by Hambrick (2007) and Lawrence (1997), "the use of demographic proxies leaves us at a loss as to the real psychological and social processes that are driving executive behavior, which is a well-known 'black box problem'". In this study, I attempt to uncover the "black box" and explore how the underlying psychological construct, extraversion, of the CEO influences a firm's decision regarding management forecasts.

Extraversion is a fundamental personality trait of each individual and is often described as the single most salient personality trait (Cain 2012). Extraversion is a component of all influential and comprehensive models of personality during the past century, e.g. Carl Jung's Psychological Types (Jung 1921), Cattell's 16 Personality Factors (Cattell 1956), the Myers-Briggs Type Indicator model (Myers 1962), Eysenck's Three-Factor model (Eysenck 1970), and the Big Five personality traits model (Goldberg 1981, Costa and McCrae 1992, John and Srivastava 1999). Extraversion manifests positive affect, assertive behavior, decisive thinking, and a desire for social engagement (Wilt and Revelle

2009; Malhotra, Reus, Zhu, and Roelofsen 2018). I focus on extraversion because extraversion has been shown to be central in leadership research (Judge, Bono, Ilies, and Gerhardt 2002) and the characteristics of extraverted individuals suggest that CEO extraversion can be directly related to management forecasting behavior.

Utilizing a novel dataset of extraversion scores for a large sample of 2,464 CEOs constructed by Green et al. (2019), I examine the effects of CEO extraversion on management earnings forecasting behavior. I also explore how two important industry-level determinants of voluntary disclosure, proprietary cost and litigation risk, moderate the relationship between CEO extraversion and management earnings forecasts. I find that extraverted CEOs are more likely to issue earnings forecasts. In addition, extraverted CEOs issue less biased forecasts, and are less likely to miss their own forecasts. I also document that the impact of CEO extraversion on the issuance and bias of management earnings forecasts is weaker when a firm faces higher proprietary cost or higher litigation risk of voluntary disclosure. My results are robust to the control for potential endogeneity issues. Analyzing the stock market reaction to management forecasts, I also show that the stock market reacts more strongly to news conveyed in management forecasts issued by CEOs with higher extraversion.

I contribute to the literature in at least two important ways. First, my study adds to the management forecast literature by providing direct evidence on the strong effects of CEO extraversion on management earnings forecasts. My study responds to Hirst et al. (2008)'s call for a better understanding of management forecast properties, since managers' choice of forecast characteristics appears to be the least understood although it is the component over which managers have the most discretion (Hirst et al. 2008). My study

provides new insights and suggests that extraversion, a key personality trait of CEOs, plays an important role in determining the issuance and bias of management earnings forecasts, and interacts with the known institutional factors in the decisions regarding management earnings forecasts.

Second, my study extends the growing literature on the impact of top managers' individual characteristics on corporate decisions under the framework of the Upper Echelons Theory (Hambrick 2007; Hambrick and Mason 1984). The Upper Echelons Theory predicts that "executives' experiences, values, and personalities greatly influence their interpretations of the situations they face and, in turn, affect their choices" (Hambrick 2007, p334). The personality traits of top managers influence not only their own behavior but also their corporate decisions (e.g., Hambrick and Mason 1984; Hiller and Hambrick 2005). However, the impact of top managers' personalities on corporate decisions is largely underexplored, probably due to the difficulty of obtaining measures of top managers' personalities for large samples.[1,2] Benefiting from the rapid development of technology, I utilize a large dataset of CEO extraversion scores constructed by Green et al (2019), who apply the trained linguistic algorithms developed by Mairesse et al. (2007) to analyze the speech patterns of CEOs. Then I examine whether and how CEO extraversion influences

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[1] An exception is that Malhotra et al. (2018) and Green et al. (2019) apply the linguistic algorithms trained by Mairesse et al. (2007) to analyze the speech patterns of executives and generate measures of executive extraversion.

[2] Another exception is two recent published papers by Ham et al. (2017a, 2017b) who use signature size to measure narcissism of executives. Ham et al. (2017a) examined the impact of CFO narcissism and financial reporting quality. Ham et al. (2017b) examined the association between CEO narcissism and a series of negative firm outcomes, e.g. overinvestment and lower financial productivity in terms of profitability and operating cash flows. However, Narcissism is a different psychological construct from extraversion. Narcissism is an extreme personality, often being deemed as a psychological disorder, characterized as being authoritative, superior, exploitative, entitled, vanity, and self-sufficient (Raskin and Howard 1988, Ham et al. 2017b), while extraversion is a basic personality that describes an ordinary person as being energetic, talkative, assertive, decisive and sociable (Wilt and Revelle 2009).

the issuance and characteristics of management earnings forecasts. My study supports the Upper Echelons Theory by showing that management forecasting, as a complex and important corporate decision, reflects the personalities of the top managers.

The rest of this paper proceeds as follows. Section 2 reviews literature and develops the hypotheses. Section 3 details the sample selection procedure and presents descriptive statistics. Section 4 describes the research design and discusses the primary results. Section 5 reports the results of additional tests, and Section 6 concludes the study.

CHAPTER 2

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 Literature related to voluntary disclosure and management earnings forecast

Financial disclosures are important channels for managers to communicate their firm performance, growth prospects, and governance to outside investors. From the perspective of financial economics, investors demand voluntary disclosures to resolve the information asymmetry and agency conflicts between investors and managers (Healy and Palepu 2001; Beyer et al. 2010).

Managers know more about the underlying economic activities and growth prospects of their companies than outside investors do. When there exists information asymmetry between insiders and potential outside investors, the investors cannot distinguish between good firms and bad firms in terms of their different profitability and growth prospects. Thus, investors are only willing to pay an average price. In this case, a good firm with high profitability and growth prospect is undervalued and is not willing to accept the price, while a bad firm is overvalued and is willing to accept the deal. In this situation, only bad firms receive external funds from investors, potentially resulting in market failure. This well-known lemon problem (Akerlof, 1970) creates the incentives for good firms to provide additional disclosures to resolve the information problem (Healy and Palepu 2001).

Investors also demand disclosures by management to resolve the agency problem. The agency conflicts arise because once investors have invested their funds in a company, they delegate their decision rights to the managers and usually do not intend to play an active role in the management and daily operations of the company. However, managers are self-interested and have incentives to make corporate decisions that expropriate investor's wealth (Jensen and Meckling 1976). Managers provide additional disclosures can help resolve the agency problem. Since shareholders could rely on the disclosures to better monitor the use of their funds by managers, they are willing to offer their funds at lower required rates of returns ex ante (Beyer et al. 2010).

It is beneficial for firms to provide voluntary disclosures to help resolve the information asymmetry and agency problem between investors and managers. For example, prior research documents that firms that extensively provide voluntary disclosures experience improved stock liquidity and reduced cost of capital (Welker 1995; Botosan 1997; Botosan and Plumlee 2002). In addition, prior studies argue that managers voluntarily provide earnings forecasts to reduce litigation risk, especially when anticipating bad news (Skinner 1994). Furthermore, Skinner (1997) find that earlier disclosure of negative earnings news is associated with lower settlement amounts when there is a lawsuit.

A large body of literature has documented and discussed the benefits of providing voluntary disclosures. However, the benefits generated from increased disclosures come along with costs. The primary cost of voluntary disclosure is the proprietary information cost (Heitzman et al. 2010). The proprietary cost concerns a firm because additional disclosures may attract competitors and threaten its competitive position in the product market and damage its firm value (Healy and Palepu 2001). Therefore, the tradeoff between

different demanding forces for accounting information and the tradeoff between the costs and benefits of providing voluntary disclosures may not always result in the financial disclosures being provided (Beyer et al. 2010).

In general, most prior research on voluntary disclosures focuses on the economic incentives and legal factors faced by a rational manager in his decision-making process regarding voluntary disclosures. A rational manager in such a decision-making scenario is viewed as representative and interchangeable with another rational manager. Prior studies largely overlook the impact of the human factors that are unique to a manager on his decisions related to voluntary disclosures.

Management earnings forecasting is a key voluntary disclosure mechanism that managers utilize to establish or change market expectations of earnings, preempt litigation concerns, and build up their reputation for transparent reporting (Hirst et al. 2008). Furthermore, prior research shows that management earnings forecasts account for a majority portion of the accounting-based information communicated to outsiders by companies. In addition, investors value the information conveyed in management earnings forecasts (Beyer et al. 2010). By tracking managers across firms over time, Bamber et al. (2010) show that individual managers are not interchangeable, and that manager-specific impact matters in management earnings forecasting decisions under the framework of the Upper Echelons Theory (Hambrick 2007; Hambrick and Mason 1984).

2.2 The Upper Echelons Theory

In recent years, there has been an increasing trend in the accounting and finance literatures investigating the impact of top managers' individual characteristics on corporate decisions and outcomes. This line of research largely relies on the theoretical framework of the Upper Echelons Theory proposed by Hambrick and Mason (1984) (e.g., Betrand and Schoar 2003; Bamber et al. 2010; Dyreng, Hanlon, and Maydew 2010; Plöckinger, Aschauer, Hiebl, and Rohatschek 2016). The Upper Echelons Theory views organizational outcomes as "the reflections of the values and cognitive bases of the powerful actors", i.e., the top managers who are also known as the "upper echelons", in such organizations (Hambrick and Mason 1984).

Since the 1950s, theorists of the Carnegie School have argued that complex decisions largely depend on behavioral factors rather than economic optimization (Cyert and March 1963; March and Simon 1958). In their view, the feasibility of complex decisions being made on a techno-economic basis is largely limited by bounded rationality, multiple and conflicting goals, myriad options, and varying aspiration levels. The complex and important corporate decisions, also known as strategic choices, stand in contrast to operational choices with calculable solutions, such as inventory decisions and credit policies. To the extent that strategic choices have a large behavioral component, such decisions reflect the idiosyncrasies of the decision makers. Therefore, the complex and important corporate decisions can be predicted, at least partially, by the idiosyncrasies such as experiences, values, and personalities of the top managers (Hambrick and Mason 1984; Hambrick 2007).

Management forecasting is a complex decision, requiring managers to tradeoff among multiple and often conflicting goals. For example, managers would like to protect the proprietary information of their firms by limiting full voluntary disclosure, including management forecasts (Verrecchia 1983; Dye 1986). However, at the same time, managers want to reduce their litigation cost, particularly when anticipating bad news, by voluntarily providing earnings forecasts (Skinner 1994, 1997). In addition, managers often operate within bounded rationality when making decisions regarding such complex situations as management forecasting. Therefore, it is reasonable to expect that management earnings forecasting behavior will reflect the idiosyncrasies such as experiences, values and personalities of the decision makers.

A large body of literature on management forecasts focuses on the economic incentives and legal factors at the market, industry and firm levels but views the top managers as interchangeable and ignores the idiosyncrasies of the top managers. There are several recent papers investigating the impact of managers' individual characteristics on management forecasting behavior. For example, Bamber et al. (2010) document the manager-specific fixed effects on corporate voluntary disclosures, incremental to the known economic determinants of disclosure, and incremental to firm and year fixed effects. Several following studies identify the impact of more specific individual characteristics of top managers on management forecasts. For example, Hribar and Yang (2016) find that overconfident CEOs are more likely to issue forecasts, and they issue optimistic forecasts and precise forecasts, reflecting the "over-optimism" and "miscalibration" dimensions of

CEO overconfidence.[3] Baik, Farber and Lee (2011) provide evidence that compared with low-ability CEOs, high-ability CEOs are more likely to issue forecasts, and they issue more accurate forecasts. Earnings forecasts issued by high-ability CEOs cause stronger market reactions. The findings in Baik et al. (2011) are consistent with Trueman's (1986) theory, which argues that managers with superior ability can signal their type by providing voluntary disclosures, resulting in increased firm valuation and enhanced individual wealth from equity-based compensations. In addition, Brockman, Campbell, Lee and Salas (2018) document that insider CEOs (internally-promoted CEOs) issue higher quality management forecast than outsider CEOs because insider CEOs have a deeper understanding of their firm's products, supply chain, operations, business climate, corporate culture, and have better inside information channels. However, prior research has not explored the impact of CEO extraversion, a fundamental personality trait, on management forecasting behavior.

In their seminal work, Betrand and Schoar (2003) explicitly state that the objective of their paper is "to ask whether managers' *personalities*, as opposed to firm, industry, or market factors, can in part account for the unexplained heterogeneity in corporate practices." However, the authors do not address the research question by directly measuring managers' personalities, probably due to the great difficulty of obtaining conventional psychometric data on top executives' personalities for a large sample. Instead, Betrand and Schoar (2003) construct a manager-firm matched panel dataset that tracks top managers across different firms over time and find that manager fixed effects matter for a wide range of corporate decisions. Prior studies label the manager fixed effect as "manager style". It is not clear

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[3] Two papers explore the impact of CEO overconfidence on management earnings forecasting (Hribar and Yang 2016; Hilary and Hsu 2011); however, overconfidence is not a personality trait from the psychological perspective and it is clearly different from extraversion. Please see section 2.3.2 for a detailed discussion about the difference between extraversion and overconfidence.

what specific personality trait(s) "manager style" really captures and it is not equivalent to the psychological construct "personality".

2.3 Extraversion

2.3.1 Extraversion as a personality trait

Personality refers to the characteristics in individual patterns of thinking, feeling and behaving that reflect an individual's tendency to respond in certain ways under certain circumstances (Phares and Chaplin1997; Roberts, 2009; American Psychology Association website 2018).[4] Extraversion is a fundamental personality trait, reflecting one of the most important ways in which individuals differ in their enduring emotional, interpersonal, experiential, attitudinal, and motivational styles (McCrae and John 1992; Costa and McCrae 1992; Goldberg 1990). Extraverted individuals are characterized as being energetic, talkative, assertive, decisive and sociable (Wilt and Revelle 2009). Extraversion is a component of all comprehensive models of personality during the past century, for example, Jung's Psychological Types, Cattell's 16 Personality Factors, the Myers-Briggs' Type Indicator model, Eysenck's Three-Factor model, and the Big Five personality traits model (Jung 1921, Cattell 1956, Myers 1962, Eysenck and Eysenck 1970, Goldberg 1981, Costa and McCrae 1992, John and Srivastava 1999). A key difference between an extraverted individual and an introverted individual is how the individual interacts with the external stimuli. An extravert gains energy from his interaction with the outside world, while an introvert gains energy from his inner world and consumes energy when he interacts with the outside world (Jung 1921).

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[4] http://www.apa.org/topics/personality/

Using hand-collected data of CEO personality traits in small samples, prior research in management provides evidence that CEO extraversion matters for firm performance (e.g., Herrmann and Nadkarni 2014; Nadkarni and Herrmann 2010; Peterson et al. 2003). However, there exists little systematic evidence on the impact of top managers' extraversion on corporate decisions. Benefiting from the rapid development in computer techniques in recent years, researchers have exploited new computer techniques to obtain conventional measures of executive personalities for large samples. Several recent studies have shown how CEO extraversion influence corporate decisions and outcomes. For example, Gow et al. (2016) provide evidence that CEO extraversion is an important determinant of corporate policies on investment, finance, and operations. Malhotra et al. (2018) show that extraverted CEOs are more likely to engage in acquisitions, to conduct larger ones, and to succeed in mergers and acquisitions. In addition, Green, Jame, and Lock (2019) document that extraverted executives enjoy better career outcomes, e.g. extraverted CEOs serve on more outside boards and hold directorships at larger firms, extraverted CEOs and CFOs earn higher salaries, extraverted CFOs are more likely to be promoted to CEO, extraverts become top executives at a younger age.

2.3.2 Extraversion versus overconfidence

Although prior research has illustrated a positive correlation between extraversion and overconfidence (Schaefer et al. 2004), there are clear differences between the two constructs from psychological and behavioral perspectives. Extraversion is a stable and persistent personality trait that manifests positive affect, assertive behavior, decisive thinking, and a desire for social engagement (Wilt and Revelle, 2009; Malhotra et al. 2017). Overconfidence is a decision bias in which a person overestimates his own accuracy, i.e. a

person's subjective confidence in his judgment is greater than the objective accuracy of the judgement (Pallier et al. 2002). Prior research has identified three categories of overconfidence behavior: (1) overestimation of one's actual performance; (2) overplacement of one's performance relative to others'; and (3) overprecision in expressing unwarranted certainty in the accuracy of one's beliefs (Moore and Healy 2008; Moore and Dev 2017).

There are two key differences between extraversion and overconfidence. First, persistence and stability over time and across situations is one of the key features of personality traits from the psychological perspective. However, overconfidence is not persistent. Prior research in psychology has broadly failed to identify stable and persistent differences in overconfidence among individuals, suggesting that it is inappropriate to treat overconfidence as a personality trait. In the review of overconfidence in psychology literature, Moore and Dev (2017) find that most individuals exhibit overconfidence on some tasks and underconfidence on other tasks. Therefore, they conclude that it is unlikely that overconfidence is a personality trait that varies among individuals in a predictable way from a psychological perspective. In the accounting literature, Hilary and Hsu (2011) have shown that overconfidence is dynamic. Managers who make accurate earnings forecasts in the previous four quarters become overconfident. These overconfident managers make more precise but less accurate earnings predictions in their subsequent forecasts, which cause investors and analysts to react less strongly (Hilary and Hsu 2011). However, extraversion has been found to be stable and persistent over time and across settings in a broad range of psychological research over the past decades (e.g. Goldberg 1990; Costa and McCrae 1992; Wilt and Revelle 2009). Therefore, extraversion and overconfidence are

different; extraversion is a stable and persistent personality trait, while overconfidence is a dynamic decision bias.

Second, extraversion is a neutral characteristic of an individual, characterized as being energetic, talkative, assertive, decisive and sociable. Introversion, the opposite to extraversion, is also a neutral characteristic of an individual, characterized as being quiet and solitary. However, overconfidence is not a neutral description of an individual, suggesting that an overconfident individual exceeds a certain conventional benchmark of confidence. The term "overconfidence" itself indicates that it deviates from the optimal level of confidence.[5]

Prior research has examined the impact of CEO overconfidence on management earnings forecasts (Hirbar and Yang 2016; Hilary and Hsu 2011). However, given the clear distinctions between overconfidence and extraversion, my study differs from prior studies. I explore the impact of CEO extraversion, an important and unique psychological construct of individuals, on management earnings forecasting decisions.

2.4 Hypotheses development

Economic theory predicts that a rational manager will make corporate decisions that maximize his own utility, which is a combination of the pecuniary benefits and the utility generated by various non-pecuniary components of his activities (Jensen and

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[5] Prior studies in finance and accounting provide evidence that overconfidence of top managers is often associated with negative corporate decisions and outcomes. For example, Malmendier and Tate (2005) provide evidence that overconfident managers tend to overinvest when they have abundant internal funds and underinvest when they require external financing. Malmendier and Tate (2008) find that overconfident managers often overpay for target companies and conduct value-destroying mergers, suggesting that these managers over-estimate their ability to generate returns in merger and acquisitions. Hribar and Yang (2016) provide evidence that overconfident managers are more likely to issue optimistically biased earnings forecasts and miss their own forecasts.

Meckling 1976). Regarding the decision of management earnings forecasting, prior research focuses on the economic incentives and legal factors faced by a representative manager, who is treated as interchangeable with another rational manager. However, the Upper Echelons Theory predicts that even facing the same situations with the same economic and legal perspectives, managers with different individual characteristics, such as experiences, values, and personalities, can interpret the situations that they face with quite differently and make heterogenous decisions accordingly (Hambrick 2007, Hambrick and Mason 1984). Several recent studies have shown that individual managers with different personal characteristics exert significant impact on the choices of management earnings forecasts (Bamber et al. 2010; Baik et al. 2011; Hirbar et al. 2016).

Given a situation with the same economic incentives and legal factors, two rational managers with different levels of extraversion may generate quite different non-pecuniary utilities from a certain set of decisions on management forecasting activities. For example, an extraverted manager enjoys being the center of social attention, so he tends to behave in ways that attract social attention (Ashton, Lee, and Paunonen 2002).[6] Management earnings forecasts are major information sources for investors. When managers voluntarily provide earnings forecasts, investors place significant weight on such information provided by managers (Beyer et al. 2010). An extraverted manager enjoys the non-pecuniary utility generated from attracting social attention by voluntarily providing management earnings forecasts.

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[6] An extravert gains energy from his interaction with the outside world, while an introvert gains energy from his inner world and consumes energy when he interacts with the outside world (Jung 1921).

By contrast, an introverted manager is characterized as being quiet and solitary. Compared with his extraverted counterpart, an introverted manager gains much less utility or even negative utility from attracting social attention, for example, by issuing management earnings forecasts voluntarily. The different expected utilities generated from the same decision to issue earnings forecasts by the two managers with different levels of extraversion can, in turn, affect the two managers' choices in management forecasts.

An extraverted CEO gains higher non-pecuniary utility when he voluntarily issues earnings forecasts than an introverted CEO does. I therefore predict that an extraverted CEO is more likely than an introverted CEO to issue management earnings forecasts. I propose my first hypothesis as follows:

H1: CEO extraversion is positively associated with the likelihood that a firm issues a management earnings forecast.

Since extraverted managers are more effective leaders, their firms perform better on average, they earn higher compensations and sit on more outside boards (Green et al. 2019), and they conduct more successful mergers and acquisitions (Malhotra et al. 2018). Therefore, extraverted managers have fewer career concerns that prevent them from voluntarily providing earnings forecasts with bad news. As a supplement to my first hypothesis, I expect that H1 holds for the issuance of earnings forecasts which reveal negative news of earnings. Specifically, I predict that CEO extraversion is positively associated with the likelihood that a firm issues a management earnings forecast with negative earnings news.

In other words, introverts are less likely to provide earnings forecasts, especially bad news forecasts for two reasons. First, it consumes energy from introverts for them to socialize with people (Jung 1921). For example, it consumes energy for introverted CEOs to attract social attention by voluntarily providing earnings forecasts. Thus, issuing earnings forecasts may generate disutility for introverted CEOs. Second, on average, introverted CEOs do not sit on as many outside boards as extraverted CEOs do, and inverted CEOs do not earn as much compensations as extraverted CEOs do. Thus, introverted CEOs suffer from more career concerns and are less willing to voluntarily provide earnings forecasts, especially bad news forecasts

Extraverted individuals are talkative and sociable (Wilt and Revelle 2009). Compared with introverted CEOs, extraverted CEOs usually have more communications with their subordinates and other stakeholders, such as suppliers, customers and creditors. Through their conversations with insiders and outsiders, extraverted CEOs gain more comprehensive views of their own companies. Knowing better about the underlying operating, financing and investing activities of their companies, extraverted CEOs can better evaluate the future performance of their own companies. Given the significant actual or perceived penalties imposed by the capital market on firms when they miss earnings targets (Skinner and Sloan 2002; Graham, Harvey, and Rajgopal 2005), rational managers have strong incentives to issue beatable earnings forecasts. I predict that managers with better information of their firms are more likely to provide beatable earnings forecasts, since they can better evaluate the future performance of their firms. Therefore, extraverted CEOs are less likely to miss their own earnings forecasts and less likely to provide upward biased forecasts.

Prior research also shows that extraverts are decisive and are more effective leaders (e.g. Judge, Bono, Ilies, and Gerhardt 2002; Bono and Judge 2004; Do and Minbashian 2014; Malhotra et al. 2018; Green et al. 2019). After managers make earnings forecasts, which will be realized as actual earnings in several days or months, extraverted CEOs are more effective in leading their firms to improve firm performance and achieve earnings targets set by themselves. Therefore, extraverted CEOs are less likely to miss their own earnings forecasts. The bias of an earnings forecast is essentially the difference between management forecasted earnings and actual earnings. I expect to observe less upward bias in the earnings forecasts issued by extraverted CEOs because extraverted CEOs are better able to lead their companies to fulfill what they forecasted.

Although I predict a negative relationship between CEO extraversion and the bias of management earnings forecasts, a few countervailing factors may indicate the opposite. Extraverted CEOs exhibit positive affect, they have higher aspirations for their own firms, and they view more opportunities for firm growth (John and Srivastava 1999; Watson and Clark 1997). Therefore, it is possible that extraverted CEOs are more likely than introverted CEOs to be overly optimistic about future firm performance. Thus, extraverted CEOs may not always issue less upward biased forecasts and be less likely to miss their own forecasts.

In addition, the leadership effectiveness of extraverted CEOs is conditional on the proactivity of their subordinates. For example, Grant, Gino, and Hoffman (2011) provide evidence that extraverted leadership works well for passive subordinates but evokes resistance among proactive subordinates. Furthermore, prior research has linked extreme extraversion to risk-taking behavior (Judge et al. 2002; Adebambo, Malhotra, and Zhu 2018). For example, extremely extraverted CEOs may take risks to forecast extremely high

earnings that their firms could not achieve. Thus, extraversion may not help CEOs to better meet or beat their own earnings forecasts.

Whether extraverted CEOs would be more likely to meet or beat their own earnings forecasts and whether extraverted CEOs would provide less upward biased earnings forecasts are not clear ex ante. These questions can be addressed empirically. I propose my second set of hypotheses as follows:

H2a: CEO extraversion is negatively associated with the likelihood that a firm will miss its own management earnings forecasts.

H2b: CEO extraversion is negatively associated with the upward bias in management earnings forecasts.

In the management literature, the impact of personality on individual behavior largely depends on the interaction between an individual and the situation faced by the individual. The situational strength influences the extent to which personality affects individual behavior. In a strong situation, an individual is less likely to behave in accordance with his personality, because the strong situation itself dictates the most acceptable practice in that situation. In contrast, in a weak situation, an individual has more discretion and flexibility to behave in a way that manifests his personality (Cooper and Withey 2009; Meyer, Dalal, and Hermida 2010).

For example, a red traffic light is a strong situation in which each driver should stop no matter what his personality is. The traffic rules set it clearly that a driver must stop on a red traffic light. The strong situation of seeing a red traffic light for a driver dictates the best practice in it and allows little room for the driver to manifest his personality, no matter

he is aggressive or cautious. In such a strong situation of facing a red traffic light for a driver, it is easy to predict the driver's behavior using the situational factor, but it is difficult to predict the driver's behavior using his personalities, such as aggressiveness or cautiousness. However, a yellow traffic light is a weak situation that allows a driver to exert discretion on his action. Since the traffic rules do not specify it very clearly whether a driver must stop or drive on a yellow traffic light, it allows room for the driver to make his own judgement and behave in a way that manifests his personality. For example, an aggressive driver may speed up and drive through the intersection when he sees a yellow traffic light, while a cautious driver may choose to stop when he is in the same situation (Cooper and Withey 2009).

In a corporate decision setting, the impact of top managers' personalities on corporate decisions largely depends on the interactions between the decision makers and the situations faced by the decision makers. The situational strength significantly moderates the relationship between top managers' personalities and corporate decisions. A strong situation allows little room for a manager to manifest his personality in corporate decisions, while a weak situation allows the manager to behave in accordance with his personality when he makes corporate decisions (Hambrick 2007; Cooper and Withey, 2009; Meyer, Dalal, and Hermida, 2010).

Proprietary information cost is a primary cost when firms make decisions regarding voluntary disclosures, such as management earnings forecasts (Heitzman et al. 2010). The proprietary cost deters firms from providing voluntary disclosures that reduce their competitive advantages in the product market (Healy and Palepu 2001).

When a manager faces high proprietary information cost, which is a strong situation regarding the earnings forecasting decisions, the situation itself determines that the best practice for the company is to avoid providing earnings forecasts that dampens its competitive advantage in the product market. In such a strong situation, the decision maker focuses more on the situational factor and is less likely to manifest his personality, such as extraversion, when he makes earnings forecasting decisions. Therefore, I predict that high proprietary cost of voluntary disclosure attenuates the relationship between CEO extraversion and management earnings forecasting decisions. I propose my third set of hypotheses as follows:

H3a: The impact of CEO extraversion on the issuance of management earnings forecasts is weaker when the proprietary cost of voluntary disclosure faced by a firm is higher.

H3b: The impact of CEO extraversion on the bias in management earnings forecasts is weaker when the proprietary cost of voluntary disclosure faced by a firm is higher.

Litigation risk is another key factor considered by managers when they make earnings forecasts (Healy and Palepu 2001). Under Rule 10b-5 of SEC Act, firms can get sued by shareholders when managers provide fraudulent or misleading statements or when managers fail to disclose material information in a timely manner. Skinner (1994) documents that firms are more likely to issue preemptive earnings forecasts preceding large earnings declines and argues that firms do so to reduce litigation risk, which is the product of the likelihood of being sued by shareholders and the estimated settlement amount if there is a lawsuit. However, Francis et al. (1994) find that firms are more likely to issue warnings

of negative earnings news in quarters that trigger shareholder litigations. Skinner (1997) suggests the result documented in Francis et al. (1997) may be driven by endogeneity, since firms have higher incentives to issue an earnings warning when the earnings news becomes worse, while these firms with worse earnings news face higher litigation risks at the same time. It is possible that these firms being sued will incur much higher litigation costs for settlement in lawsuits if they haven't issued earlier earnings warnings.

In addition, Skinner (1997) find that earlier disclosure of negative earnings news is associated with lower settlement amounts when there is a lawsuit, after controlling for the endogeneity issue using the estimated shareholder litigation damages. Field et al. (2005) control for endogeneity using the simultaneous equations approach and find no relationship between the issuance of earnings guidance preceding bad news and the incidence of litigation in the full sample. Furthermore, Field et al. (2005) show that preemptive earnings guidance reduces the likelihood of litigation in a subsample without dismissed lawsuits, suggesting a positive relationship between litigation risk and earnings guidance, consistent with Skinner (1994, 1997). Donelson et al (2012) also provide evidence that timely revelation of bad earnings news reduces the likelihood of litigation.

Two recent studies exploit exogenous shocks on litigation risks and establish causal links between litigation risk and management earnings forecasting practices. Houston et al. (2019) document a positive relationship between the changes of litigation risk resulting from three exogenous legal events in the U.S. and the changes of management earnings forecasts, especially for earnings forecasts conveying bad news. Furthermore, Naughton et al. (2019) show that the treatment firms reduce their earnings forecasts following an exogenous reduction of litigation costs for foreign cross-listed companies in the U.S. In

Naughton et al. (2019), the positive relationship between litigation risk and earnings forecasts is not conditional on the direction of the news conveyed in earnings forecasts.

Also, firms tend to issue less upward biased earnings forecasts when facing high litigation threats from shareholders because the litigation environment in the U.S. imposes an asymmetric loss function on firms (Skinner 1994). Managers often get sued when shareholders bear a large loss of stock returns due to the disclosure of overly optimistic earnings forecasts or the absence of timely disclosure of bad news. However, managers rarely get sued when shareholders fail to gain higher stock returns due to the overly pessimistic earnings forecasts or the lack of timely disclosure of good news (Rogers and Stocken 2005).

Therefore, high litigation risk is a strong situation that dictates the most acceptable practice of management earnings forecasts and refrains a manager from manifesting his own personality when he makes earnings forecasting decisions. I predict that the high litigation risk faced by a firm weakens the effects of CEO extraversion on the issuance and bias of management earnings forecasts. My fourth set of hypotheses is proposed as follows:

H4a: The impact of CEO extraversion on the issuance of management earnings forecasts is weakened by the high litigation risk faced by a firm.

H4b: The impact of CEO extraversion on the bias in management earnings forecasts is weakened by the high litigation risk faced by a firm.

CHAPTER 3

SAMPLE SELECTION AND VARIABLE DEFINITIONS

3.1 Sample selection

To construct my samples, I start with ExecuComp, where I obtain a full list of the 43,740 unique CEO-firm-year observations during 1992-2016. Then, I obtain the CEO extraversion scores from Green et al. (2019).[7] Next, I merge the CEO extraversion scores with the CEO-firm-year list obtained from ExecuComp in my first step. Then, I collect the information of educational background, work experience and military experience of CEOs from Boardex and then merge this information to the CEO-firm-year list from the last step. Completing this step, I get a sample of 15,880 CEO-firm-year observations, with non-missing data for individual characteristics of CEOs, including extraversion, overconfidence, stock holding, tenure and demographic characteristics. Next, I calculate other control variables as defined in Appendix A, using data from Compustat, CRSP, IBES, and Thomson Reuters.

In the following step, I extract all quantitative management earnings forecasts during 1992-2016 from IBES Guidance, including annual and quarterly earnings forecasts. If there is more than one forecasts issued on a given day for a firm with the same forecast period end date, I keep the one with the shortest forecast periodicity. The reason of combing

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[7] Please refer to section 3.2 for more details.

management forecasts of different periodicity in my analysis is to keep the most available and unique information, because I notice that in the universe of management earnings forecasts on IBES Guidance, some firms issue annual forecasts for certain years, then switch to quarterly forecasts for subsequent years. Some firms update annual earnings forecasts four times a year, which is similar to quarterly forecasts. It is a large loss of information if I only keep annual forecasts or quarterly forecasts. Therefore, for each firm with a certain forecast period end date, I treat each earnings forecast announcement date as a unique observation of management guidance. Then, I merge management forecast data with the firm level control variables and the CEO-firm-year list to create two separate samples (Sample A and Sample B).

My first sample (Sample A) is constructed to test the impact of CEO extraversion on the issuance of management earnings forecasts. Sample A consists of 10,908 unique firm-year observations with extraversion measure available and the firm-level and CEO-level control variables available. *Issue* is a firm-year specific variable. When a firm issued at least one earnings forecast in year t, the firm is treated as an issuing firm in that year. Next, I construct my second sample (Sample B) to test the impact of CEO extraversion on the bias of management earnings forecasts. The Sample B consists of 21,294 unique firm-forecast-year observations of firms that issue forecasts and have non-missing forecast-level characteristics, extraversion measure and control variables at firm and CEO levels.

3.2 Measuring CEO extraversion

The measure of CEO extraversion in my study is based on the fundamental "lexical hypothesis" in personality psychology. The lexical hypothesis in personality psychology states that "the most important individual differences in human transactions will come to

be encoded as single terms in some or all of the world's languages (Galton 1884, Goldberg 1993)". The lexical hypothesis suggests that human's naïve use of language encodes indispensable information about their mental models of others and such information is the key to identify basic personality traits (Neuman 2016). Benefiting from the rapid development of computer techniques in recent years, much progress has been made in deriving personality traits from conversations and texts based on the lexical approach to measure personalities (Arnoux et al. 2017; Plank and Hovy 2015; Schwartz et al., 2013; Mairesse et al. 2007).

A few recent studies in accounting and management literature have utilized the linguistic algorithms developed by Mairesse et al. (2007) to analyze the non-scripted spoken texts of the CEOs and infer their extraversion scores (Malhotra et al. 2018; Green et al. 2019). My study uses the dataset of CEO extraversion scores constructed by Green et al. (2019)[8], which includes the extraversion scores of 2,464 unique CEOs.

Extraverted individuals are characterized as being energetic, talkative, assertive, decisive and sociable, whereas introverted individuals tend to be quiet, reserved and solitary. Extraversion can be detected based on its manifestation in communication patterns. For example, extraverts have higher verbal output, use less word variety and less formal language, and they are more assertive. Extraverts also tend to use more emotion words and tend to repeat their words (Pennebaker and King 1999; Gill and Oberlander 2003; Green et al. 2019).[9]

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[8] I thank Green et al. (2019) for making the dataset of their measure of aggregate extraversion for CEOs available.

[9] As summarized in Green et al (2019), Mairesse et al. (2007) document that the use of the following categories of words by an individual is positively associated with his extraversion: "affective or emotional processes, anger, metaphysical issues, negative emotions, physical sates and functions, positive feelings,

Utilizing the personality algorithms trained by Mairesse et al. (2007), Green et al. (2019) take the non-scripted spoken texts of executives from the Q&A session of the earnings conference calls as input and generate extraversion scores of CEOs based on their linguistic features. The Q&A session is more likely to be non-scripted than the presentation session of the earnings conference calls for two reasons. First, the words spoken by an executive in response to real time questions from analysts are more likely to be the executive's own words and unscripted, while the words used in the presentation segment by an executive are likely to be scripted by others, e.g. legal department, compliance department, and public relations department (Hollander, Pronk, and Roelofsen 2010; Matsumoto, Pronk, and Roelofsen 2011). Second, individuals are more likely to truly reveal their variations of extraversion in complex and stressful situations, such as the Q&A session in conference calls faced by the executives (Dewaele and Furnham 1999).

The process of estimating the aggregate CEO extraversion scores is as follows as documented in Green et al. (2019). First, for CEOs to be included in the sample, they must appear in at least three earnings conference calls. Then Green et al. (2019) estimate CEO extraversion scores at each conference call level using four different linguistic algorithms developed in Mairesse et al. (2007).[10] After they get the four measures of the call-level extraversion scores of each CEO, Green et al. (2019) aggregate the extraversion score to CEO level by weighted average the call-level extraversion scores, in which weights are

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religion, swear words, imageability, meaningfulness, word count, and language frequency", while the use of assent words and word uniqueness are negatively associated with an individual's extraversion (Green et al. 2019).

[10] The four linguistic algorithms developed in Mairesse et al. (2007) are Linear Regression (LR), Support Vector Machine Regression (SVR), M5' Model Tree (M5P) and M5' Regression Tree (M5R). For technical details, please refer to the online appendix and Green et al. (2019) and Mairesse et al. (2007). Call-level extraversion scores generated by each of the four linguistic models are winsorized at the 1st and 99th percentile.

assigned based on the number of words spoken on each conference call by the CEO. Extraversion is a time-invariant manager-specific measure.

To validate this measure, Green et al. (2019) involve BBA students, who are third-party observers, to evaluate the extraversion level for each executive on a 7-point scale based on the audio excerpt. When the observers do the evaluation based on audio excerpt, they have access to the written transcripts of the Q&A session of the earnings conference calls. Then Green et al. (2019) classify CEO extraversion binarily based on the mean rating of extraversion from the observers (also known as listeners) and get a listener-based binary measure of CEO extraversion. Next, Green et al. (2019) classify CEO extraversion binarily based on the mean extraversion score of the sample where extraversion scores are generated by the algorithms developed by Mairesse et al. (2007) and get an algorithm-based binary measure of CEO extraversion. They find that their listener-based measure and algorithm-based measure of extraversion align with each other 68% of the time, which is consistent with what has been documented in Mairesse et al. (2007).

Some introverted CEOs may concentrate in certain industries, for example, Mark Zuckerburg and Bill Gates are representative introverted CEOs and their companies both operate in the computer programming and data processing industry. To reduce the likelihood that the measure of CEO extraversion used in this study captures mostly the industry differences, I rank the CEO extraversion scores dichotomously within industry and create a dichotomous measure of CEO extraversion (*Extraversion*). The CEO extraversion raw scores, measured based on a 7-point scale, vary a lot across different industries.

3.3 Measuring Management Forecast Issuance and Properties

To examine the effects of CEO extraversion on management forecast issuance and properties, I define the forecast properties as follow. *Issue* is an indicator variable, which equals one if the firm issued at least one forecast in year t, and zero otherwise. As a supplement test, I also replace *Issue* with *BN* to test my H1. *BN* is an indicator variable that equals to one if the firm issued at least one forecast with negative earnings news in year t, and zero otherwise. I test my first hypothesis on Sample A.

To test my second set of hypotheses on whether and how CEO extraversion affects the upward bias of an earnings forecast, I define Miss and MFE as follows. *Miss* is an indicator variable that equals one if a manager misses his own earnings forecast for the fiscal year t, and zero otherwise. For point and open-ended forecasts, *Miss* equals one if the actual EPS is less than the forecasted EPS by management, and zero otherwise. For a range forecast, *Miss* equals one if the actual EPS is less than the lower bound of the range forecast. *MFE*, referring to management forecast error, is a continuous variable. *MFE* equals management forecasted earnings minus actual earnings, scaled by the stock price at the beginning of the year. For a range forecast, I use the midpoint of the range forecast as management forecasted earnings. *MFE* measures the upward bias of a forecast. The larger the value of *MFE*, the more biased a forecast is. I test my second set of hypotheses on Sample B.

I include a set of control variables in my analyses, which are describe in the next section. A detailed summary of the variable definitions and data sources is listed in the Appendix A.

[Insert Table 1]

Table 1 reports descriptive statistics. In Sample A, the likelihood of a firm issuing a management earnings forecast is 60.08%. Overall, 45.93% of the firms issued bad news forecasts during my sample period. In Sample B, the mean (median) of management forecast errors (MFE) is 0.0002 (-0.0007). Overall, 22.82% of the time managers miss their own earnings forecasts. Regarding CEO individual characteristics, the mean of *Extraversion* is 0.4826, suggesting that 48.26% of the CEOs are classified as being extraverted. The mean of the CEO overconfidence measure, *Holder67*, is 0.5822. The correlation between *Extraversion* and *Holder67* is 0.06440.

CHAPTER 4

RESEARCH DESIGN AND EMPIRICAL ANALYSIS

To test my first hypothesis of whether and how CEO extraversion influences the issuance of management earnings forecast, I model the issuance decision as a function of CEO extraversion and a set of control variables that have been shown by prior studies to be determinants of management forecast issuance. Specifically, I run a logit regression model to predict the likelihood of managers issuing management earnings forecasts on Sample A using equation (1) as follows:

$$\Pr(Issue) = \alpha_0 + \alpha_1 Extraversion + \alpha_2 Size + \alpha_3 MB + \alpha_4 LIT + \alpha_5 Loss +$$

$$\alpha_6 InstOwn + \alpha_7 Annret + \alpha_8 Stdret + \alpha_9 Equityissue + \alpha_{10} MA +$$

$$\alpha_{11} Restructure + \alpha_{12} RD + \alpha_{13} MW + \alpha_{14} NumAnalyst + \alpha_{15} ExeOwn +$$

$$\alpha_{16} Holder67 + \alpha_{17} Tenure + \alpha_{18} Age + \alpha_{19} Male + \alpha_{20} AF + \alpha_{21} Law +$$

$$\alpha_{22} Operation + \alpha_{23} Government + \alpha_{24} Military + \alpha_{25} InternalCEO +$$

$$\alpha_{26} Doctorate + \alpha_{27} MBA + \alpha_{28} GradHonors + \alpha_{29} IvyLeague +$$

$$Year\ fixed\ effects + \varepsilon \quad (1),$$

Issue is an indicator variable equal to one if the firm issued at least one forecast in year t, and zero otherwise.

Following prior studies, I include several firm-level and CEO-level control variables in my prediction model of management forecast issuance. I include firm size (*Size*)

because prior research finds that larger firms are more likely to provide voluntary disclosure (Lang and Lundholm 1996; Bhojraj, Libby, and Yang 2010). Then I include market-to-book ratio (*MB*) to proxy for growth opportunities and proprietary information costs associated with providing voluntary disclosure (Bamber and Cheon 1998; Ajinkya, Bhojraj, and Sengupta 2005). I also include research and development expenditure (*RD*) as an additional control for proprietary information costs (Wang 2007). In addition, prior research finds that firms with poor performance are less likely to provide voluntary disclosures (Miller 2002). Thus, I include a loss indicator (*Loss*) and annual stock return (*Annret*) to capture the performance effect following Li and Zhang (2015). I also include stock return volatility (*Stdret*) to proxy for information uncertainty since it is more difficult for managers to issue high quality forecasts when facing more uncertainty (Rogers and Stocken 2005).

In addition, I include a control variable for litigation risk (*LIT*), which is an indicator variable representing firm membership in a high-litigation-risk industry as identified by Francis, Philbrick, and Schipper (1994). Prior research argues that higher litigation risk motivates managers to issue earnings forecasts voluntarily (Skinner 1994) and to provide less upward biased earnings forecasts (Rogers and Stocken 2005). I further control for institutional ownership (*Instown*), since prior research indicates that firms with higher institutional ownership are more likely to issue management forecasts (Ajinkya et al. 2005). Next, I include the number of analysts following a firm (*NumAnalyst*) because prior research documents that the number of analysts following a firm influences the issuance of management earnings forecast (e.g., Lang and Lundholm 1996; Feng et al. 2009).

Furthermore, I add merger and acquisition related activities (*MA)* and equity offerings (*EquityIssue*) to control for the significant events on capital markets in which firms have strong incentives to provide more information to reduce information asymmetry (Hribar and Yang 2016). Next, I control for restructuring activities (*Restructure*) because the increased uncertainty around restructurings may obstruct the formation of earnings guidance (Brochet, Faurel, and McVay 2011). In addition, I control for the material internal control weaknesses (*MW*) as Feng, Li, and McVay (2009) document that firms with material weaknesses in internal control are more likely to issue earnings forecasts with greater error.

Then I add several CEO-level control variables, since prior studies document the effects of the individual characteristics of CEOs on management earnings forecasting behavior. I include a conventional measure of CEO overconfidence (*Holder67*) since Hribar and Yang (2016) find that CEO overconfidence is an important determinant of management forecast issuance and properties. I also include the executive stock ownership (*Exeown*), since prior research suggests that executive stock ownership is associated with manager's incentives to manage earnings (Cheng and Warfield 2005) and management guidance could be used as a tool to guide analyst forecasts down to achievable earnings targets (Cotter, Tuna, and Wysocki 2006). Besides, I include the *Tenure, Age* and gender (*Male*) of CEOs to control for the impact of such CEO-specific characteristics on management forecasting behavior (Nalikka 2009; Huang, Rose-Green, and Lee 2012; Park and Yoo 2016).

Furthermore, I control for the educational background, work experience and military experience of the CEOs since prior research has linked the manager fixed effects

on management earnings forecasts to these observable demographic characteristics of top managers (Bamber et al. 2010). By controlling for these observable demographic characteristics of CEOs, it increases the likelihood that *Extraversion* captures the effect of CEO extraversion on management forecasting behavior that is not captured by the known CEO characteristics that are documented in prior literature.

To control for the educational background of a CEO, I include dummy variables indicating whether the CEO owns a doctorate degree (*Doctorate*) or an MBA degree (*MBA*), whether the CEO graduated from an Ivy League school (*IvyLeague*) and whether the CEO graduated with honors in any stage of his higher education (*GradHonors*). Next, I include five dummy variables to control for the work experience of a CEO before he becomes the CEO. For example, I control for accounting and finance related work experience (*AF),* law related work experience or educational background *(Law),* operations related work experience *(Operation)* and government related work experience *(Government).* In addition, I include a dummy variable to control for the military experience of the CEO (*Military*). I also include a dummy variable to control for the internal work experience of the CEO (*InternalCEO*) since prior research documents the impact of CEO internal work experience on management earnings forecasting behavior (Brockman et al. 2018).

As a supplement, I use *BN* an alternative measure of the issuance of earnings forecasts and run the following logit regression mode (1b):

$$\Pr(BN) = \alpha_0 + \alpha_1 Extraversion + \alpha_2 Size + \alpha_3 MB + \alpha_4 LIT + \alpha_5 Loss +$$

$$\alpha_6 InstOwn + \alpha_7 Annret + \alpha_8 Stdret + \alpha_9 Equityissue + \alpha_{10} MA +$$

$$\alpha_{11} Restructure + \alpha_{12} RD + \alpha_{13} MW + \alpha_{14} NumAnalyst + \alpha_{15} ExeOwn +$$

$$\alpha_{16} Holder67 + \alpha_{17} Tenure + \alpha_{18} Age + \alpha_{19} Male + \alpha_{20} AF + \alpha_{21} Law +$$

$$\alpha_{22}Operation + \alpha_{23}Government + \alpha_{24}Military + \alpha_{25}InternalCEO +$$

$$\alpha_{26}Doctorate + \alpha_{27}MBA + \alpha_{28}GradHonors + \alpha_{29}IvyLeague +$$

$$Year\ fixed\ effects + \varepsilon \quad (1b),$$

BN is an indicator variable that equals to one if the firm issued at least one management earnings forecast with negative earnings news in year t, and zero otherwise.

A detailed definition of each variable is listed in Appendix A. All continuous variables are decile ranked and scaled to be between 0 and 1, for the ease of interpreting the impact of variables and with the benefit of not limiting the relationship between dependent variables and independent variables to be linear.

The variable of interest in the prediction model (1) is *Extraversion*. I predict the coefficient on *Extraversion* to be positive and significant to support my first hypothesis. The result of the prediction model of management forecasts issuance is reported in Table 2. Consistent with my prediction, I find that the coefficient on *Extraversion* is positive and significant in both columns (1) and (2) of Table 2, supporting my first hypothesis. The effect is economically significant. In columns (1) and (2) of Table 2, moving CEO extraversion (*Extraversion)* from 0 to 1 results in an increase in the odds of the firm issuing an earnings forecast and a bad news forecast by 15.81% and 18.87% respectively.[11]

[Insert Table 2]

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[11] To obtain the estimates, I take the exponential of the product value of the coefficients on *Extraversion* (0.1468 and 0.1729 respectively, from Table 2 columns (1) and (2)), then minus 1.

In both columns (1) and (2) of Table 2, the coefficients on *LIT* are positive and significant, consistent with the prediction in the prior literature that high litigation risk encourages firms to provide earnings forecasts to reduce litigation risks, especially when anticipating bad news (Skinner 1994, 1997). In addition, the negative coefficients on *LOSS* and *Annret* are consistent with the prior literature that firms with poor performance are less likely to provide earnings forecasts (Miller 2002). Furthermore, the positive and significant coefficients on *Instown* are consistent with the findings in prior literature that firms with higher institutional ownership are more likely to issue earnings forecasts (Ajinka et al. 2005). The positive coefficients on *NumAnalyst* suggest that firms with more analysts following are more likely to issue earnings forecasts, consistent with the prior literature. The coefficients on *MA* and *EquityIssue* in both columns (1) and (2) of Table 2 are positive and significant, suggesting that firms voluntarily provide more information to reduce information asymmetry when experiencing significant events in the capital market, consistent with the prior literature. The coefficients on *MW* are negative and significant, suggesting that managers know that they have material weaknesses and thus are less likely to provide guidance. The coefficients on *Holder67* are not significant, suggesting that CEO extraversion (*Extraversion*) subsumes CEO overconfidence (*Holder67*) regarding its impact on management earnings forecasts.

To test my second set of hypotheses, I include additional control variables and exclude the number of analysts following (*NumAnalyst*), since prior research has documented that the number of analysts following does not influence the properties of issued earnings forecast (e.g., Lang and Lundholm 1996; Feng et al. 2009). I include the discretionary accruals (*DisAccr*) estimated from the modified Jones (1991) model

(McNichols 2002) as an additional control variable since Kasznik (1999) provides evidence that managers are likely to manage earnings to avoid missing their own forecasts. I also control for forecast horizon (*Horizon*) and news (*News*) following Hribar and Yang (2016) since I expect that managers have less information about realized earnings the earlier the forecast is issued and when the news is bad.

To test my second set of hypotheses on the impact of CEO extraversion on bias of management earnings forecasts, I first run the logit model (2a) on the Sample B. Model (2a) estimate the likelihood of firms missing their own earnings forecasts. Variable of interest is *Extraversion*. Hypothesis 2a predicts that the coefficient on *Extraversion* is negative and significant.

$$\Pr(Miss) = \alpha_0 + \alpha_1 Extraversion + \alpha_2 Size + \alpha_3 MB + \alpha_4 LIT + \alpha_5 Loss +$$
$$\alpha_6 InstOwn + \alpha_7 Annret + \alpha_8 Stdret + \alpha_9 Equityissue + \alpha_{10} MA +$$
$$\alpha_{11} Restructure + \alpha_{12} RD + \alpha_{13} MW + \alpha_{14} DisAccr + \alpha_{15} Horizon +$$
$$\alpha_{16} News + \alpha_{17} ExeOwn + \alpha_{18} Holder67 + \alpha_{19} Tenure + \alpha_{20} Age +$$
$$\alpha_{21} Male + \alpha_{22} AF + \alpha_{23} Law + \alpha_{24} Operation + \alpha_{25} Government +$$
$$\alpha_{26} Military + \alpha_{27} InternalCEO + \alpha_{28} Doctorate + \alpha_{29} MBA +$$
$$\alpha_{30} GradHonors + \alpha_{31} IvyLeague + Year\ fixed\ effects + \varepsilon \quad \text{(2a)},$$

Miss is an indicator variable, which equals one if the actual earning is less than the management forecast, and zero otherwise. For range forecasts, *Miss* equals one if the actual earnings is less than the lower bound of the range estimate.

[Insert Table 3]

The regression results are reported in column (1) of Table 3. I find a negative and significant coefficient on *Extraversion* in model (2a), suggesting that extraverted CEOs are less likely to miss their own forecasts, consistent with H2a. The effect is economically significant. In Table 3 column (1), moving CEO extraversion (*Extraversion)* from 0 to 1 results in a decrease in the odds of the firm missing its own forecast by 15.33%.[12]

Next, I run the OLS regression model (2b) on sample B. Model (2b) evaluates how CEO extraversion (*Extraversion*) affects the bias (*MFE* or forecast error) of a forecast. Hypothesis 2b predicts the coefficient on *Extraversion* to be negative and significant.

$$MFE = \alpha_0 + \alpha_1 Extraversion + \alpha_2 Size + \alpha_3 MB + \alpha_4 LIT + \alpha_5 Loss +$$

$$\alpha_6 InstOwn + \alpha_7 Annret + \alpha_8 Stdret + \alpha_9 Equityissue + \alpha_{10} MA +$$

$$\alpha_{11} Restructure + \alpha_{12} RD + \alpha_{13} MW + \alpha_{14} DisAccr + \alpha_{15} Horizon +$$

$$\alpha_{16} News + \alpha_{17} ExeOwn + \alpha_{18} Holder67 + \alpha_{19} Tenure + \alpha_{20} Age +$$

$$\alpha_{21} Male + \alpha_{22} AF + \alpha_{23} Law + \alpha_{24} Operation + \alpha_{25} Government +$$

$$\alpha_{26} Military + \alpha_{27} InternalCEO + \alpha_{28} Doctorate + \alpha_{29} MBA +$$

$$\alpha_{30} GradHonors + \alpha_{31} IvyLeague + Year\ fixed\ effects + \varepsilon \quad (2b),$$

MFE, management forecast error, equals the management earnings forecast minus the actual earnings, scaled by the stock price at the beginning of year. For range forecasts, I use the midpoint of the range forecast as the management earnings forecast.

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[12] To obtain the estimate, I take the exponential of the product value of the coefficient on *Extraversion* (-0.1664, from table 3 column 1), then minus 1.

As reported in column (2) of Table 3, I find a negative and significant coefficient on *Extraversion* in model (2b), suggesting that the management forecast error is negatively associated with CEO extraversion. The regression result of model (2b) indicates that extraverted CEOs issue less upward biased forecasts, supporting my H2b. The effect is economically significant. In Table 3 column (2), moving CEO extraversion (*Extraversion)* from 0 to 1 results in a decrease in the management forecast error (*MFE*) of an earnings forecast by 214.29% of the absolute value of the median management forecast error (*MFE*).[13] The regression results of models (2a) and (2b) suggest that extraverted CEOs provide less biased forecasts and they are less likely to miss their own forecasts.

In Table 3 columns (1) and (2), the coefficients on *LIT* are negative and significant, consistent with the prediction in the prior literature that firms tend to provide earnings forecasts with less upward biases when facing high litigation risk (Skinner 1994; Rogers and Stoken 2005). In addition, the positive coefficients on *Horizon* is consistent with the evidence in prior literature that the earlier the forecasts being made, the less information the managers have about the realized portion of earnings, the more bias appears in the forecasts (Hribar and Yang 2016). The positive coefficients on *Holder67* are consistent with the findings in Hribar and Yang (2016). The coefficients on *Holder67* in Table 3 columns (1) and (2) are insignificant, suggesting that CEO extraversion (*Extraversion*) subsumes CEO overconfidence (*Holder67*) regarding its impact on the bias of issued earnings forecasts.

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[13] To obtain the estimate, I multiply the value of the coefficient on *Extraversion* (-0.0135, from Table 3 column (2)) by (1/9), then divide the product by the absolute value of the median value of *MFE* (-0.0007, from table 1).

To test my third hypothesis on whether and how the proprietary cost of voluntary disclosure influences the relationship between CEO extraversion and the issuance and biases of management earnings forecasts. I include two industry level proxies for the proprietary cost of voluntary disclosure. The first proxy is based on the total number of firms operating within an industry. I count the total number of firms operating within a specific four-digit SIC industry each year. The more firms operate within the same industry, the more the competition from existing competitors and the higher proprietary cost of providing voluntary disclosure. Then I dichotomously rank the number of firms operate within a specific four-digit SIC industry and get my first measure of industry level proprietary cost of voluntary disclosure (*IND_NUM*). *IND_NUM* equals one if a four-digit SIC industry has a larger number of firms operating in it than the median of the overall number of firms operating in each industry.

The second proxy is based on the industry level aggregate gross profit margin. The second measure is a complement to the first measure. The proprietary cost of voluntary disclosure for a firm largely depends on the competition faced by the firm in its product market, including the competition from existing rivals operating in the same industry and the threats from the potential entrants. The competition in the product market also depends on the industry structure, product differentiation or product substitutability (Li 2010). Due to the debates on the pros and cons of sales-based measure of industry concentration in prior studies (Ali et al. 2014; Lang and Sul 2014), I adopt an industry-level profitability measure, which is an outcome-based measure, reflecting the influence of industry structure (such as monopoly, oligopoly or free competition) and more directly measure proprietary cost faced by a firm results from the competition in its product market. The industry-level

gross profit margin, also known as the price-cost margin, is calculated as industry aggregate sales divided by industry aggregate operating costs for each four-digit SIC industry each year. The higher the price-cost margin, the more the competition attracted from the potential entrants and consequently the higher the proprietary cost faced by firms which already operate in this industry. *IND_MGN* equals one if the price-cost margin of a specific four-digit industry in a specific year is higher than the median of the overall price-cost margin, and zero otherwise.

To test my third set of hypotheses, I include the interaction term of CEO extraversion and a proxy for proprietary cost (*Prop_Cost*) and the main effect of the proprietary cost (*Prop_Cost*) in my regression models (1), (1b), (2a), and (2b) respectively as follows:

$$\Pr(Issue) = \alpha_0 + \alpha_1 Extraversion + \alpha_2 Extraversion * Prop\_Cost +$$
$$\alpha_3 Prop\_Cost + \alpha_4 Size + \alpha_5 MB + \alpha_6 LIT + \alpha_7 Loss + \alpha_8 InstOwn +$$
$$\alpha_9 Annret + \alpha_{10} Stdret + \alpha_{11} Equityissue + \alpha_{12} MA + \alpha_{13} Restructure +$$
$$\alpha_{14} RD + \alpha_{15} MW + \alpha_{16} NumAnalyst + \alpha_{17} ExeOwn + \alpha_{18} Holder67 +$$
$$\alpha_{19} Tenure + \alpha_{20} Age + \alpha_{21} Male + \alpha_{22} AF + \alpha_{23} Law + \alpha_{24} Operation +$$
$$\alpha_{25} Government + \alpha_{26} Military + \alpha_{27} InternalCEO + \alpha_{28} Doctorate +$$
$$\alpha_{29} MBA + \alpha_{30} GradHonors + \alpha_{31} IvyLeague + Year\ fixed\ effects + \varepsilon$$

(3a),

$$\Pr(BN) = \alpha_0 + \alpha_1 Extraversion + \alpha_2 Extraversion * Prop\_Cost +$$
$$\alpha_3 Prop\_Cost + \alpha_4 Size + \alpha_5 MB + \alpha_6 LIT + \alpha_7 Loss + \alpha_8 InstOwn +$$
$$\alpha_9 Annret + \alpha_{10} Stdret + \alpha_{11} Equityissue + \alpha_{12} MA + \alpha_{13} Restructure +$$

$\alpha_{14}RD + \alpha_{15}MW + \alpha_{16}NumAnalyst + \alpha_{17}ExeOwn + \alpha_{18}Holder67 +$

$\alpha_{19}Tenure + \alpha_{20}Age + \alpha_{21}Male + \alpha_{22}AF + \alpha_{23}Law + \alpha_{24}Operation +$

$\alpha_{25}Government + \alpha_{26}Military + \alpha_{27}InternalCEO + \alpha_{28}Doctorate +$

$\alpha_{29}MBA + \alpha_{30}GradHonors + \alpha_{31}IvyLeague + Year\ fixed\ effects + \varepsilon$

(3b),

$Pr(Miss) = \alpha_0 + \alpha_1 Extraversion + \alpha_2 Extraversion * Prop\_Cost +$

$\alpha_3 Prop\_Cost + \alpha_4 Size + \alpha_5 MB + \alpha_6 LIT + \alpha_7 Loss + \alpha_8 InstOwn +$

$\alpha_9 Annret + \alpha_{10} Stdret + \alpha_{11} Equityissue + \alpha_{12} MA + \alpha_{13} Restructure +$

$\alpha_{14}RD + \alpha_{15}MW + \alpha_{16}DisAccr + \alpha_{17}Horizon + \alpha_{18}News + \alpha_{19}ExeOwn +$

$\alpha_{20}Holder67 + \alpha_{21}Tenure + \alpha_{22}Age + \alpha_{23}Male + \alpha_{24}AF + \alpha_{25}Law +$

$\alpha_{26}Operation + \alpha_{27}Government + \alpha_{28}Military + \alpha_{29}InternalCEO +$

$\alpha_{30}Doctorate + \alpha_{31}MBA + \alpha_{32}GradHonors + \alpha_{33}IvyLeague +$

$Year\ fixed\ effects + \varepsilon$ (3c),

$MFE = \alpha_0 + \alpha_1 Extraversion + \alpha_2 Extraversion * Prop\_Cost +$

$\alpha_3 Prop\_Cost + \alpha_4 Size + \alpha_5 MB + \alpha_6 LIT + \alpha_7 Loss + \alpha_8 InstOwn +$

$\alpha_9 Annret + \alpha_{10} Stdret + \alpha_{11} Equityissue + \alpha_{12} MA + \alpha_{13} Restructure +$

$\alpha_{14}RD + \alpha_{15}MW + \alpha_{16}DisAccr + \alpha_{17}Horizon + \alpha_{18}News + \alpha_{19}ExeOwn +$

$\alpha_{20}Holder67 + \alpha_{21}Tenure + \alpha_{22}Age + \alpha_{23}Male + \alpha_{24}AF + \alpha_{25}Law +$

$\alpha_{26}Operation + \alpha_{27}Government + \alpha_{28}Military + \alpha_{29}InternalCEO +$

$\alpha_{30}Doctorate + \alpha_{31}MBA + \alpha_{32}GradHonors + \alpha_{33}IvyLeague +$

$Year\ fixed\ effects + \varepsilon$ (3d),

Prop_Cost is an industry-level proxy for the proprietary cost of voluntary disclosure. *Prop_Cost* equals *IND_NUM* or *IND_MGN*. The variable of interest is $Extraversion * Prop\_Cost$. To support my third set of hypotheses, I expect the coefficient on $Extraversion * Prop\_Cost$ to be negative and significant in regression models (3a) and (3b) and to be positive and significant in regression models (3c) and (3d). The regression analyses of models (3a) and (3b) are conducted on sample A and the regression analyses of models (3c) and (3d) are conducted on sample B.

[Insert Table 4]

Table 4 Panel A exhibits the results when *IND_NUM* is the industry-level proxy for the proprietary cost of voluntary disclosure. I find negative and significant coefficients on the interaction term of *Extraversion*IND_NUM* in Table 4 Panel A columns (1) and (2), consistent with my H3a that the impact of CEO extraversion on the issuance of a management earnings forecast is attenuated when a firm faces high proprietary cost of voluntary disclosure. Furthermore, consistent with my H3b, I find positive and significant coefficients on *Extraversion*IND_NUM* in Table 4 Panel A columns (3) and (4) respectively, suggesting that the negative relationship between CEO extraversion and the bias of management forecasts is weaker when a firm faces higher proprietary cost of voluntary disclosure. The negative and significant coefficients on *IND_NUM* in Table 4 Panel A Columns (1) and (2) are consistent with the prediction in prior literature that firms facing high competition from existing competitors are discouraged from issuing earnings

forecasts. The negative and significant coefficients on *IND_NUM* in Columns (3) and (4) of Table 4 Panel A are consistent with the prediction in prior literature that firms facing higher competition from existing competitors provide voluntary disclosures with higher quality, i.e. less biased earnings forecasts in my study.

Table 4 Panel B exhibits the results when *IND_MGN* serves as the industry-level proxy for the proprietary cost of voluntary disclosure. *IND_MGN* is a proxy for the proprietary cost of voluntary disclosure associated with the competition from potential entrants in the product market. The negative and significant coefficients on *Extraversion*IND_MGN* in Table 4 Panel B columns (1) and (2) are consistent with the H3a. The positive coefficients on *Extraversion*IND_MGN* in Table 4 Panel B columns (3) and (4) are consistent with the H3b. In other words, I get consistent results when proprietary cost is proxied by *IND_MGN,* providing further support for my third set of hypotheses that the impact of CEO extraversion on the issuance and bias of management earnings forecasts is attenuated by the high proprietary cost of voluntary disclosure faced by a firm.

In addition, the positive and significant coefficients on *IND_MGN* in Table 4 Panel B Columns (1) and (2) are consistent with the prediction in prior literature that firms facing high competition from potential entrants are encouraged to provide earnings forecasts. The negative coefficients on *IND_MGN* in Columns (3) and (4) of Table 4 Panel B are consistent with the prediction in prior literature that firms facing higher competition from potential entrants provide voluntary disclosures with higher quality.

To test my fourth set of hypotheses on whether and how the litigation risk of voluntary disclosure influences the relationship between CEO extraversion and the issuance and biases of management earnings forecasts. I include the same industry-level

indicator variable of litigation risk (*LIT*) as I included in the regression model (1).

Litigation risk (*LIT*) is an indicator variable representing firm membership in a high-litigation-risk industry as identified by Francis, Philbrick, and Schipper (1994). I also include the interaction term of CEO extraversion (*Extraversion*) and litigation risk (*LIT*) in the regression models (1), (1b), (2a), and (2b) separately as follows:

$$\Pr(Issue) = \alpha_0 + \alpha_1 Extraversion + \alpha_2 Extraversion * LIT + \alpha_3 LIT +$$

$$\alpha_4 Size + \alpha_5 MB + \alpha_6 Loss + \alpha_7 InstOwn + \alpha_8 Annret + \alpha_9 Stdret +$$

$$\alpha_{10} Equityissue + \alpha_{11} MA + \alpha_{12} Restructure + \alpha_{13} RD + \alpha_{14} MW +$$

$$\alpha_{15} NumAnalyst + \alpha_{16} ExeOwn + \alpha_{17} Holder67 + \alpha_{18} Tenure + \alpha_{19} Age +$$

$$\alpha_{20} Male + \alpha_{21} AF + \alpha_{22} Law + \alpha_{23} Operation + \alpha_{24} Government +$$

$$\alpha_{25} Military + \alpha_{26} InternalCEO + \alpha_{27} Doctorate + \alpha_{28} MBA +$$

$$\alpha_{29} GradHonors + \alpha_{30} IvyLeague + Year\ fixed\ effects + \varepsilon \quad (4a),$$

$$\Pr(BN) = \alpha_0 + \alpha_1 Extraversion + \alpha_2 Extraversion * LIT + \alpha_3 LIT +$$

$$\alpha_4 Size + \alpha_5 MB + \alpha_6 Loss + \alpha_7 InstOwn + \alpha_8 Annret + \alpha_9 Stdret +$$

$$\alpha_{10} Equityissue + \alpha_{11} MA + \alpha_{12} Restructure + \alpha_{13} RD + \alpha_{14} MW +$$

$$\alpha_{15} NumAnalyst + \alpha_{16} ExeOwn + \alpha_{17} Holder67 + \alpha_{18} Tenure + \alpha_{19} Age +$$

$$\alpha_{20} Male + \alpha_{21} AF + \alpha_{22} Law + \alpha_{23} Operation + \alpha_{24} Government +$$

$$\alpha_{25} Military + \alpha_{26} InternalCEO + \alpha_{27} Doctorate + \alpha_{28} MBA +$$

$$\alpha_{29} GradHonors + \alpha_{30} IvyLeague + Year\ fixed\ effects + \varepsilon \quad (4b),$$

$$\Pr(Miss) = \alpha_0 + \alpha_1 Extraversion + \alpha_2 Extraversion * LIT + \alpha_3 LIT +$$

$$\alpha_4 Size + \alpha_5 MB + \alpha_6 Loss + \alpha_7 InstOwn + \alpha_8 Annret + \alpha_9 Stdret +$$

$$\alpha_{10}Equityissue + \alpha_{11}MA + \alpha_{12}Restructure + \alpha_{13}RD + \alpha_{14}MW +$$

$$\alpha_{15}DisAccr + \alpha_{16}Horizon + \alpha_{17}News + \alpha_{18}ExeOwn + \alpha_{19}Holder67 +$$

$$\alpha_{20}Tenure + \alpha_{21}Age + \alpha_{22}Male + \alpha_{23}AF + \alpha_{24}Law + \alpha_{25}Operation +$$

$$\alpha_{26}Government + \alpha_{27}Military + \alpha_{28}InternalCEO + \alpha_{29}Doctorate +$$

$$\alpha_{30}MBA + \alpha_{31}GradHonors + \alpha_{32}IvyLeague + Year\ fixed\ effects + \varepsilon$$

(4c),

$$MFE = \alpha_0 + \alpha_1 Extraversion + \alpha_2 Extraversion * LIT + \alpha_3 LIT + \alpha_4 Size +$$

$$\alpha_5 MB + \alpha_6 Loss + \alpha_7 InstOwn + \alpha_8 Annret + \alpha_9 Stdret + \alpha_{10}Equityissue +$$

$$\alpha_{11}MA + \alpha_{12}Restructure + \alpha_{13}RD + \alpha_{14}MW + \alpha_{15}DisAccr +$$

$$\alpha_{16}Horizon + \alpha_{17}News + \alpha_{18}ExeOwn + \alpha_{19}Holder67 + \alpha_{20}Tenure +$$

$$\alpha_{21}Age + \alpha_{22}Male + \alpha_{23}AF + \alpha_{24}Law + \alpha_{25}Operation +$$

$$\alpha_{26}Government + \alpha_{27}Military + \alpha_{28}InternalCEO + \alpha_{29}Doctorate +$$

$$\alpha_{30}MBA + \alpha_{31}GradHonors + \alpha_{32}IvyLeague + Year\ fixed\ effects + \varepsilon$$

(4d),

LIT is an industry-level proxy for the litigation risk of voluntary disclosure. The variable of interest is $Extraversion * LIT$. To support my fourth set of hypotheses, I expect the coefficients on $Extraversion * LIT$ to be negative and significant in regression models (4a) and (4b), and the coefficients on $Extraversion * LIT$ to be positive and significant in regression models (4c) and (4d). The regression models (4a) and (4b) are tested on sample A and the regression models (4c) and (4d) are tested on sample B.

[Insert Table 5]

Table 5 exhibits the regression results. I find negative and significant coefficients on *Extraversion*LIT* in columns (1) and (2) of Table 5, consistent with H4a. In addition, I find positive and significant coefficients on *Extraversion*LIT* in columns (3) and (4) of Table 5, consistent with my H4b. The positive and significant coefficients on *LIT* in Table 5 Columns (1) and (2) are consistent with the prediction in prior literature that firms facing high litigation risk are encouraged to issue preemptive earnings forecasts (Skinner 1994, 1997). The negative and significant coefficients on *LIT* in Columns (3) and (4) of Table 5 are consistent with the prediction in prior literature that firms facing high litigation risk tend to provide less upward biased earnings forecasts (Skinner 1994; Rogers and Stoken 2005). Taken together, the regression results listed in Table 5 suggest that the effects of CEO extraversion on the issuance and bias of management forecasts are attenuated when a firm faces high litigation risk of voluntary disclosure.

CHAPTER 5

ADDITIONAL TESTS

5.1 Determinants model of a firm's decision in choosing an extraverted CEO

It is possible that firms with certain characteristics choose to hire extraverted CEOs, while the same characteristics of firms also determine their management forecasting decisions. To control for this potential endogeneity issue, I use a determinants model with firm-level characteristics to predict the CEO extraversion raw scores. For each CEO-firm pair, I include an average value of each of the four firm characteristics, including firm size (*Size),* market to book ratio (*MB*), a loss indicator (*Loss*) and earnings (*Earn*), in the determinants model to estimate CEO extraversion raw scores. I get the residual CEO extraversion scores from the determinants model (5) as follows:

$$Extraversion\_raw_{i,j} = \beta_0 + \beta_1 Meansize_{i,j} + \beta_2 MeanMB_{i,j} + \beta_3 Meanloss_{i,j} +$$
$$\beta_4 Meanearn_{i,j} + \varepsilon \quad (5),$$

where i,j denote a firm-manager specific pair of firm i and manager j.

Then I rank the residual CEO extraversion scores within industry and get the residual measure of CEO extraversion (*Residual_Extra*). I replace the original CEO extraversion measure (*Extraversion*) with the residual measure of CEO extraversion (*Residual_Extra*) in regression models (1), (1b), (2a), and (2b). The regression models (1)

and (1b) are tested on sample A, and the regression models (2a) and (2b) are tested on sample B. I get consistent results as my main analyses. Table 6 exhibits the results.

[Insert Table 6]

5.2 Heckman two-stage model

Since the decision to issue a management earnings forecast is voluntary, it is possible that certain factors, which determine whether a firm issues an earnings forecast, also determine forecast properties, such as bias, and result in the findings that I observed. To address the potential endogeneity of issuance of management earnings forecasts, I utilize a Heckman (1979) two-stage model following prior studies (Feng et al. 2009, Hribar and Yang 2016). In the first stage, I estimate a probit regression of the choice to provide management guidance using model (1) of Section 4 on the full sample with 28,445 CEO-forecast-firm-year observations.

To effectively control for the endogeneity issue, it is important to identify at least one independent variable that predicts the binary dependent variable in the first-stage model but does not correlate with the dependent variable in the second-stage model (Larcker and Rusticus 2010; Lennox, Francis, and Zhang 2012). Prior research has documented that the number of analysts following (*NumAnalyst*) influences the issuance of management earnings forecasts (e.g. Lang and Lundholm 1996; Feng et al. 2009) but is not significantly associated with forecast properties (Ajinkya et al. 2005; Feng et al. 2009). Following Feng et al. (2009) and Hribar and Yang (2016), I include the number of analysts

following (*NumAnalyst*) as the exclusion restriction variable in the first-stage model, but not in the second-stage model of the Heckman (1979) procedure.

As shown in Table 2 that *Extraversion* is a factor that significantly predicts the issuance of management earnings forecast, I construct the inverse Mills ratio (*IMR*) from a probit regression of model (1) to control for self-selection problem in the remaining regressions of forecast characteristics (Heckman 1979).[14] The inverse Mills ratio is the ratio of the standard normal probability density function to the standard normal cumulative density function. I add the inverse Mills ratio (*IMR*) in models (2a) and (2b) where the sample includes only firm-year observations where firms issue forecasts. The results of the second-stage models using Heckman (1979) procedure are reported in Table 7. Results of both regressions are consistent with the results in the main analyses that I report in Table 3, suggesting that the main findings of the effects of CEO extraversion on the bias of management earnings forecasts are robust after controlling for the self-selection issue.

[Insert Table 7]

5.3 Include additional four personality traits of CEOs

Extraversion is a component of all comprehensive and influential personality traits models during the past century (e.g. Jung 1921, Cattell 1956, Myers 1962, Eysenck and Eysenck 1970, Goldberg 1981, Costa and McCrae 1992, John and Srivastava 1999). In the Big Five personality traits model, which is widely used recently, extraversion and other

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[14] Probit regression result of first stage (model (1)) is not tabulated.

four personality traits (emotional stability, conscientiousness, openness, and agreeableness) are treated as the fundamental dimensions of an individual's personality.

The five dimensions of the "Big Five" personality traits represent personality at the broadest level of abstraction, and each dimension consists of many distinct and more specific personality characteristics (John and Srivastava, 1999). For example, *agreeableness* includes characteristics such as altruism, tender-mindedness, tolerance, trust, cooperativeness and modesty; *conscientiousness* reflects the individual characteristics of being careful, thorough, responsible, organized, hardworking, achievement-oriented and persevering; *emotional stability*, which includes characteristics that are associated with being emotionally stable, calm and tempered, contrasts with neuroticism, which is characterized as being anxious, nervous, insecure and tense; *openness to experience* describes the breadth, depth, originality, creativity, complexity and flexibility of an individual's thoughts and feelings (Digman 1990; Barrick and Mount 1991; McCrae and John 1992; John and Srivastava 1999; Abatecola, Mandarelli, and Poggesi 2013).

Although these five dimensions are orthogonal to each other ideally (Norman 1963), the empirical studies document that extraversion tends to correlate with the other four traits in the Big Five model (Olson 2005). Thus, I include the additional four personality traits in my regression models (1), (1b), (2a), and (2b) to reduce the likelihood of observing a spurious association between CEO extraversion and management earnings forecasts. Furthermore, it provides a more comprehensive picture of how all "Big Five" fundamental personality traits of a CEO influence his decisions regarding management earnings forecasts by including additional four personality traits of a CEO. The raw scores of the other four personality traits (emotional stability, conscientiousness, openness, and

agreeableness) are also obtained from Green et al. (2019). I dichotomously rank these four traits within industry and create four variables (*Emotional_stability*, *Conscientiousness*, *Openness*, and *Agreeableness*), to make them comparable to *Extraversion*. The regression results are reported in Table 8. Including additional four personality traits of the "Big Five" traits model in my regression analyses does not change my main results.

[Insert Table 8]

5.4 Stock market reaction

In a stock market where investors hold rational expectations, I expect investors to identify a firm manager's stylistic earnings forecasting properties associated with the manager's extraversion. For example, investors could identify whether an extraverted CEO issues biased earnings forecasts and adjust for the expected forecast bias when determining the firm's stock price. If investors believe a forecast is less biased, they should react more strongly to such forecasts; in contrast, if investors believe a forecast is more biased, they should react less strongly to such a forecast (Rogers and Stocken 2005). According to my second set of hypotheses and my findings in support of my H2a and H2b as exhibited in Table 3, extraverted managers issue less upward biased forecasts. Therefore, I expect that investors react more strongly to management forecasts issued by CEOs with higher extraversion. The empirical results documented in Table 9 support this prediction.

To test the stock market reaction, I run the following OLS regression model (6) on a subsample of firms that issue earnings forecasts. Model (6) tests whether and how CEO extraversion affects investors' reaction to news conveyed in management forecasts.

$$RET(0,2) = \alpha_0 + \alpha_1 News + \alpha_2 News * Extraversion + \alpha_3 News * Size +$$

$$\alpha_4 News * MB + \alpha_5 News * Loss + \alpha_6 Extraversion + \alpha_7 Size + \alpha_8 MB +$$

$$\alpha_9 Loss + \varepsilon \text{ (6)},$$

RET (0,2) is the three-day compounded stock return, starting at the management earnings forecast announcement date. *News* is the management forecasted earnings minus prevailing analysts' consensus forecast earnings, scaled by the beginning of year stock price.

The variable of interest is *News*Extraversion*. I include *News, Size, MB,* and *Loss* as controls. I also control for the interactions of *Size, MB,* and *Loss* with *News* respectively, following prior study (Hilary and Hsu 2011).

[Insert Table 9]

As reported in Table 9 panel A, I find a positive and significant coefficient on *News*Extraversion*, suggesting that a management forecast provided by an extraverted CEO causes stronger market reaction, given the news conveyed in the forecast.

To test the stock market reaction in a cleaner setting, I exclude all bundled forecasts from my analysis following prior studies (Atiase, Supattarakul, and Tse 2005; Hilary and

Hsu 2011).[15] Specifically, I exclude management earnings forecasts issued in the three-day window of an earnings announcement, centered on the earnings announcement date, where the earnings announcement date is identified using the Compustat quarterly file. Although such exclusion largely reduces my sample size (deleted about 70% of my full sample), it also reduces the likelihood that my findings are driven by market reaction to news contained in earnings announcement rather than in management earnings forecast. After the step of excluding bundled forecasts, I get a sample of 12,565 CEO-firm-forecast observations. Then I re-run an OLS regression of model (6) on the subsample with non-bundled forecasts.

The regression results are reported in Table 9 panel B. I consistently find a positive and significant coefficient on *News*Extraversion* in this stricter setting, consistent with my finding based on the sample of all firms that issue earnings forecasts. Together with the findings in Table 3 that extraverted CEOs constantly provide less biased forecasts, my findings in Table 9 suggest that investors could recognize the stylistic properties of management forecasts associated with CEO extraversion, then react to management forecasts provided by CEOs with different levels of extraversion accordingly.

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[15] Prior research suggests that there is an increasing trend that firms issue bundled forecasts, where managers issue earnings forecasts for future periods jointly with the release of actual earnings for current period. Rogers and Van Buskirk (2013) provide evidence that roughly 70%-80% of all management earnings forecasts are bundled forecasts in recent years.

CHAPTER 6

CONCLUSION AND IMPLICATION

In this study, I examine the effects of CEO extraversion on management earnings forecasting decisions. I find that CEO extraversion is positively associate with the likelihood of a firm issuing earnings forecasts and is negatively associated with the bias of issued forecasts. I document that the two important industry level determinants of voluntary disclosure, proprietary cost and litigation risk, moderate the relationship between CEO extraversion and management earnings forecasting decisions. The impacts of CEO extraversion on the issuance and bias of management earnings forecasts are weaker when a firm faces higher proprietary cost or higher litigation risk of voluntary disclosure.

To my best knowledge, my study is the first to empirically document the effects of CEO extraversion on management earnings forecasting decisions. I contribute to the literature by providing evidence that extraversion, a fundamental and salient individual personality trait (Cain 2012), of a CEO plays an important role in determining the issuance and bias of management earnings forecasts. Furthermore, my study is the first to explore the interactions between CEO personality and institutional factors in management earnings forecasting decisions. My study provides new insights on when and why the human factors may or may not matter in management forecasting decisions. My study also adds to the growing literature on manager-specific effects on corporate decisions under the framework

of the Upper Echelons Theory (Hambrick and Mason 1984; Hambrick 2007) by showing that management forecasting, as a complex and important corporate decision, reflects the personalities of top managers.

Several implications can be drawn from my study. First, investors, regulators and other users of financial disclosures should be aware of this evidence and pay attention to the individual characteristics of top managers when using and analyzing the information provided by management. Doing so will help financial information users more effectively process the disclosed information since individual characteristics, such as extraversion, of top managers are useful predictors of management earnings forecasting behavior.

Second, a large body of the accounting and finance literature is based on the economic theories and ignores the idiosyncrasies of individual managers in corporate decisions. However, starting at Betrand and Schoar (2003), a few recent studies relax the assumption that managers are homogenous and interchangeable in corporate decisions (see Plöckinger et al. (2016) for a review). Future researchers can further extend this venue for accounting research and explore what additional individual characteristics of managers play important roles in the accounting related corporate decisions. For example, the impact of the personalities of individual managers on corporate decisions is largely underexplored and can be enriched in future research. Similarly, future research may investigate what are the roles played by the individual characteristics of analysts, who are important information intermediaries, in their information production and dissemination processes and how these factors influence the efficiency of the information dissemination and capital allocation in the capital market. In addition, the individual characteristics of auditors can also play an important role in their auditing process and audit report formation process, which in turn

can affect the efficiency and effectiveness of the resource allocation in the economy. For example, He, Kothari, Xiao, and Zuo (2018) provide initial evidence that the economic condition at an auditor's early career has a long-term impact on his professional judgement in auditing. Along this line of research, a lot of other individual characteristics of auditors can be explored in future research.

Third, my study takes an initial trial to explore the interactions between human factors and the well-established institutional factors in management forecasting decisions. It will be interesting and meaningful in future research to explore how the human factors, which are largely neglected in most prior research, interact with the institutional factors in other corporate decisions, especially accounting and finance related decisions. This line of research will provide a more comprehensive picture for both academics and practitioners in accounting and finance area about whether and how human factors influence corporate decisions and when and why human factors may or may not matter in corporate decisions.

APPENDIX A
VARIABLE DEFINITIONS

Variables	Definition	Data Source
Issue	Indicator variable, which equals one if the firm issued at least one forecast in year t, and zero otherwise.	IBES
BN	Indicator variable, which equals one if the firm issued at least one forecast with negative earnings news in year t, and zero otherwise. Earnings news of a management forecast is negative if the forecasted earnings is lower than the prevailing analysts' consensus forecast earnings	IBES
Miss	Miss equals one if the actual earning is less than the management forecast, and zero otherwise. For range forecasts, equals one if the actual earning is less than the lower bound of the range estimate.	IBES
MFE	MFE, management forecast error, equals management earnings forecast minus actual earnings, scaled by stock price at the beginning of year. For range forecasts, the midpoint of the range forecast is used as management earnings forecast.	IBES
Horizon	Horizon is the number of days between management earnings forecast announcement date and fiscal year end.	IBES
News	News is the management forecast earnings minus prevailing analysts' consensus forecast earnings, scaled by the beginning of year stock price.	IBES
RET (0,2)	Three-day compound stock returns, starting at management earnings forecast announcement date.	CRSP
CEO characteristics		
Extraversion	A binary measure of CEO extraversion within each industry. The raw CEO extraversion score is generated by Green et al. (2019) who analyze the linguistic characteristics of the non-scripted spoken texts of CEOs with algorithms developed by Mairesse et al. (2007).	Green et al. (2019)

Exeown	CEO stock ownership (option excluded) as a percentage of shares outstanding in year t.	ExecuComp
Holder67	A measure of CEO overconfidence computed following Malmendier, Tate, and Yan (2011) and Humphery-Jenner, Lisic, Nanda, Silveri (2016).	ExecuComp, Compustat
Tenure	Number of years being CEO since he first appeared as CEO ExecuComp for the same company.	ExecuComp
Age	The present age of the CEO in year t.	ExecuComp
Male	Indicator variable, which equals one if a CEO is male, and zero otherwise.	ExecuComp
Doctorate	Indicator variable, which equals one if a CEO owns a doctorate degree, and zero otherwise.	Boardex
MBA	Indicator variable, which equals one if a CEO owns a MBA degree, and zero otherwise.	Boardex
GradHonors	Indicator variable, which equals one if a CEO graduated with honors in any stage of his higher education, and zero otherwise.	Boardex
Ivyleague	Indicator variable, which equals one if a CEO graduated from an Ivy league school, and zero otherwise.	Boardex
AF	Indicator variable, which equals one if a CEO has accounting and finance related work experience, and zero otherwise.	Boardex
LAW	Indicator variable, which equals one if a CEO has law related work experience, and zero otherwise.	Boardex
Operation	Indicator variable, which equals one if a CEO has operations related work experience, and zero otherwise.	Boardex
Government	Indicator variable, which equals one if a CEO has work experience in government, and zero otherwise.	Boardex
InternalCEO	Indicator variable, which equals one if a CEO has internal work experience, and zero otherwise.	Boardex
Military	Indicator variable, which equals one if a CEO has military service experience, and zero otherwise.	Boardex
Firm Characteristics		
Size	Log of total assets at the beginning of year t.	Compustat
MB	Market-to-book ratio (CSHO*PRCC_F/CEQ) at the beginning of year t.	Compustat
LIT	Indicator variable, coded as one if a firm is in a high-litigation-risk industry, with SIC codes 2833–2836, 3570– 3577, 3600–3674, 5200–5961, and 7370—7374, and zero otherwise, following Francis, Philbrick, and Schipper (1994)	Compustat

Loss	Indicator variable which equals one if the firm reported loss in year t, and zero otherwise.	Compustat
Instown	Institutional ownership at the beginning of year t.	Thomson Reuters
Annret	Cumulative daily returns over the 12 months prior to year t.	Compustat, CRSP
Stdret	Standard deviation of daily returns over the 12 months prior to year t.	CRSP
Equityissue	EquityIssue is a dummy variable equal to one if the firm issued shares in year t	Compustat
MW	MW equals one if the firm reported a material weakness in year t, and zero otherwise	Audit Analytics
MA	MA equals one if the firm has a merger or acquisition in year t	Compustat
Restructure	Restructure equals one if the firm engages in a restructuring in year t	Compustat
RD	RD equals the firm's R&D expenditures in year t scaled by total assets at the beginning of year t	Compustat
DisAccr	The residual is calculated using modified Jones (1991), as modified by McNichols (2002).	Compustat
NumAnalyst	Number of analysts following the firm at the beginning of year t.	IBES
IMR	IMR is the inverse Mill's ratio estimated from the first stage of the Heckman model.	
Industry characteristics		
IND_NUM	IND_NUM equals one if the number of firms operating in a specific four-digit SIC industry in year t is larger than the median of the overall number of firms operating in each industry.	Compustat
IND_MGN	IND_MGN equals one if the price-cost margin of a specific four-digit SIC industry in year t is higher than the median of the overall price-cost margin, and zero otherwise. The price-cost margin of a specific four-digit SIC industry is calculated as industry aggregate sales (SALE) divided by industry aggregate operating costs (COGS) within the same four-digit SIC industry in year t.	Compustat

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Table 1: Descriptive Statistics

Variable	N	Mean	Std Dev	Lower Quartile	Median	Upper Quartile
Issue	10908	0.6008	0.4897	0.0000	1.0000	1.0000
BN	10908	0.4593	0.4984	0.0000	0.0000	1.0000
Size	10908	7.4718	1.6086	6.3055	7.3540	8.4885
MB	10908	3.5552	57.5806	1.5414	2.3385	3.7438
Loss	10908	0.3683	0.4824	0.0000	0.0000	1.0000
LIT	10908	0.1330	0.3396	0.0000	0.0000	0.0000
Instown	10908	0.7562	0.1906	0.6468	0.7742	0.8825
Annret	10908	0.1891	0.7130	-0.1118	0.1158	0.3559
Stdret	10908	0.0260	0.0130	0.0171	0.0232	0.0315
EquityIssue	10908	0.7250	0.4465	0.0000	1.0000	1.0000
MA	10908	0.1888	0.3913	0.0000	0.0000	0.0000
Restructure	10908	0.3690	0.4826	0.0000	0.0000	1.0000
RD	10908	0.0350	0.0768	0.0000	0.0022	0.0459
MW	10908	0.0325	0.1775	0.0000	0.0000	0.0000
NumAnalyst	10908	13.9213	9.7222	7.0000	12.0000	19.0000
Extraversion	10908	0.4826	0.4997	0.0000	0.0000	1.0000
Extraversion_raw	10908	4.1572	0.3821	3.9168	4.1525	4.3921
Exeown	10908	1.8811	5.1793	0.0300	0.2800	1.1000
Holder67	10908	0.5822	0.4932	0.0000	1.0000	1.0000
Tenure	10908	6.3032	4.5038	3.0000	5.0000	9.0000
Age	10908	55.5384	7.0407	51.0000	55.0000	60.0000
Male	10908	0.9697	0.1715	1.0000	1.0000	1.0000
AF	10908	0.1710	0.3765	0.0000	0.0000	0.0000
LAW	10908	0.0557	0.2294	0.0000	0.0000	0.0000
Operation	10908	0.4156	0.4928	0.0000	0.0000	1.0000
Government	10908	0.1305	0.3368	0.0000	0.0000	0.0000
Military	10908	0.0263	0.1601	0.0000	0.0000	0.0000

InternalCEO	10908	0.6134	0.4870	0.0000	1.0000	1.0000
Doctorate	10908	0.0676	0.2510	0.0000	0.0000	0.0000
MBA	10908	0.2655	0.4416	0.0000	0.0000	1.0000
GradHonors	10908	0.0704	0.2558	0.0000	0.0000	0.0000
Ivyleague	10908	0.1634	0.3697	0.0000	0.0000	0.0000
Openness	10908	0.5054	0.5000	0.0000	1.0000	1.0000
Conscientiousness	10908	0.4948	0.5000	0.0000	0.0000	1.0000
Agreeableness	10908	0.5096	0.4999	0.0000	1.0000	1.0000
Emotional_stability	10908	0.4947	0.5000	0.0000	0.0000	1.0000
Miss[a]	21294	0.2282	0.4197	0.0000	0.0000	0.0000
MFE[a]	21294	0.0002	0.0199	-0.0030	-0.0007	0.0009
News[a]	21294	-0.0005	0.0068	-0.0012	-0.0002	0.0006
Horizon[a]	21294	195.45	137.07	71.00	166.00	296.00
DisAccr[a]	21294	-0.0031	0.0452	-0.0238	-0.0024	0.0165
RET(0,2)	41002	0.0047	0.0996	-0.0386	0.0026	0.0469
RET(0,2)[b]	12565	-0.0056	0.0917	-0.0335	0.0000	0.0307

Note: Variables are as defined in Appendix A. a denotes that the descriptive statistics for Miss, MFE, News, Horizon, and DisAccr are based on the sample B. b denotes that the descriptive statistics for RET (0,2)[b] are based on the subsample of non-bundled forecasts.

Table 2: The Impact of CEO Extraversion on the Issuance of

Management Earnings Forecasts

VARIABLES	(1) Issue	(2) BN
Extraversion	**0.1468[#]**	**0.1729[##]**
	(1.44)	**(1.90)**
Size	-0.1806	-0.0932
	(-0.73)	(-0.42)
MB	0.0269	0.1634
	(0.16)	(1.11)
LIT	0.5415***	0.3246***
	(4.48)	(3.11)
LOSS	-0.6763***	-0.5293***
	(-7.95)	(-6.26)
Instown	0.5961***	0.4412***
	(3.80)	(3.11)
Annret	-0.1089	-0.1777**
	(-1.39)	(-2.16)
Stdret	-1.7566***	-1.7103***
	(-9.62)	(-10.39)
EquityIssue	0.2500***	0.1870***
	(4.29)	(3.29)
MA	0.2443***	0.2416***
	(3.18)	(3.43)
Restructure	0.2560***	0.1807**
	(3.09)	(2.48)
RD	0.4445**	0.0850
	(2.38)	(0.52)
MW	-0.3359**	-0.2245*
	(-2.45)	(-1.76)
Numanalyst	0.4045*	0.1627
	(1.91)	(0.88)
Exeown	0.0293	0.0926
	(0.18)	(0.59)
Holder67	-0.0592	-0.0537
	(-0.57)	(-0.58)
Tenure	0.2404	0.1167
	(1.14)	(0.60)
Age	-0.1357	-0.0657
	(-0.84)	(-0.44)
Male	0.1679	0.1161
	(0.67)	(0.50)
AF	0.1386	0.0221
	(1.07)	(0.19)

Law	-0.0248	-0.3242
	(-0.06)	(-1.02)
Operation	0.2499**	0.1415
	(2.26)	(1.45)
Government	0.0262	-0.0377
	(0.16)	(-0.27)
Military	0.0317	0.1600
	(0.09)	(0.53)
InternalCEO	0.0919	0.1109
	(0.79)	(1.08)
Doctorate	0.3565	0.5497*
	(0.98)	(1.79)
MBA	0.0055	0.0857
	(0.05)	(0.85)
GradHonors	-0.3738*	-0.2193
	(-1.69)	(-1.11)
IvyLeague	0.1307	0.0900
	(0.92)	(0.75)
Constant	-0.8809	-0.4146
	(-1.48)	(-1.22)
Observations	10,908	10,416
Year FE	YES	YES
Pseudo R-squared	0.0913	0.0839

Note: The columns (1) and (2) of Table 2 report the logit regression results of model (1) and model (2) respectively as described in Section 4. Variables are as defined in Appendix A. Standard errors are clustered by firm. z-statistics based on robust standard errors are reported in parentheses.

***, **, and * denote statistical significance at 1%, 5%, and 10% levels (two-tailed), respectively.
###, ##, and # denote statistical significance at 1%, 5%, and 10% levels (one-tailed), respectively.

Table 3: The Impact of CEO Extraversion on the Bias of Management Earnings Forecasts

VARIABLES	(1) Miss	(2) MFE
Extraversion	**-0.1664##**	**-0.0135#**
	(-2.20)	**(-1.37)**
Size	-0.1201	-0.0026
	(-0.74)	(-0.12)
MB	0.1375	0.0650***
	(0.94)	(3.36)
LIT	-0.2001**	-0.0209*
	(-2.57)	(-1.94)
LOSS	1.0078***	0.1504***
	(9.22)	(7.39)
Instown	0.3027**	0.0475**
	(2.38)	(2.51)
Annret	-0.8885***	-0.1268***
	(-7.06)	(-7.68)
Stdret	0.4784***	-0.0883***
	(2.78)	(-3.76)
EquityIssue	0.0928	0.0169*
	(1.12)	(1.65)
MA	0.0354	0.0002
	(0.46)	(0.02)
Restructure	-0.0779	-0.0285***
	(-1.04)	(-2.83)
RD	-0.3514***	-0.0370**
	(-2.71)	(-2.02)
MW	0.3287*	0.0086
	(1.71)	(0.29)
DisAccr	0.3529***	0.0704***
	(3.48)	(5.21)
Horizon	1.6788***	0.0163
	(22.32)	(1.51)
News	0.0295	-0.0083
	(0.43)	(-0.85)
Exeown	-0.0129	0.0145
	(-0.10)	(0.73)
Holder67	0.0131	0.0100
	(0.16)	(0.94)
Tenure	0.4055**	0.0658***
	(2.21)	(2.64)
Age	0.0491	-0.0045
	(0.39)	(-0.25)
Male	-0.0315	0.0021

	(1)	(2)
	(-0.16)	(0.07)
AF	-0.1385	-0.0045
	(-1.36)	(-0.33)
Law	-0.0116	0.0494
	(-0.06)	(1.57)
Operation	0.1037	0.0245**
	(1.19)	(2.12)
Government	-0.0922	-0.0066
	(-0.79)	(-0.43)
Military	-0.1480	0.0015
	(-0.71)	(0.06)
InternalCEO	-0.0044	-0.0125
	(-0.05)	(-1.03)
Doctorate	-0.4505**	-0.0701**
	(-2.38)	(-2.49)
MBA	-0.0490	0.0026
	(-0.58)	(0.21)
GradHonors	0.2479*	-0.0141
	(1.73)	(-0.68)
IvyLeague	0.1008	0.0025
	(1.03)	(0.19)
Constant	-1.9083*	0.5471***
	(-1.85)	(8.69)
Observations	21,294	21,294
Year FE	YES	YES
Pseudo R-squared	0.0932	
Adjusted R-squared		0.079

Note: Table 3 column (1) reports the logit regression result of model (2a) as described in Section 4. Table 3 column (2) reports the OLS regression result of model (2b) as described in section 4. Variables are as defined in Appendix A. Standard errors are clustered by firm. In column (1), z-statistics based on robust standard errors are reported in parentheses. In column (2), t-statistics based on robust standard errors are reported in parentheses.
***, **, and * denote statistical significance at 1%, 5%, and 10% levels (two-tailed), respectively.
###, ##, and # denote statistical significance at 1%, 5%, and 10% levels (one-tailed), respectively.

Table 4: The Impact of High Proprietary Cost on the Relationship Between CEO Extraversion and Management Earnings Forecasts

Panel A

VARIABLES	(1) Issue	(2) BN	(3) Miss	(4) MFE
Extraversion	**0.2756##**	**0.3355###**	**-0.3527###**	**-0.0385###**
	(1.89)	**(2.60)**	**(-3.78)**	**(-2.99)**
Extraversion* IND_NUM	**-0.2695#**	**-0.3505##**	**0.4443###**	**0.0561###**
	(-1.40)	**(-2.04)**	**(3.00)**	**(2.83)**
IND_NUM	-0.1914#	-0.2124##	-0.6097###	-0.0556###
	(-1.35)	(-1.69)	(-5.40)	(-3.61)
Size	-0.1924	-0.1194	-0.1024	-0.0016
	(-0.78)	(-0.54)	(-0.63)	(-0.07)
MB	-0.0044	0.1239	0.0673	0.0586***
	(-0.03)	(0.84)	(0.46)	(3.02)
LIT	0.5981***	0.3952***	-0.1192	-0.0149
	(4.91)	(3.76)	(-1.47)	(-1.33)
LOSS	-0.6598***	-0.5089***	1.0454***	0.1528***
	(-7.77)	(-6.04)	(9.63)	(7.65)
Instown	0.5555***	0.3889***	0.2709**	0.0460**
	(3.55)	(2.73)	(2.17)	(2.45)
Annret	-0.0954	-0.1661**	-0.8999***	-0.1275***
	(-1.22)	(-2.01)	(-7.13)	(-7.73)
Stdret	-1.7354***	-1.6935***	0.4274**	-0.0933***
	(-9.43)	(-10.21)	(2.46)	(-3.94)
EquityIssue	0.2643***	0.2033***	0.1095	0.0175*
	(4.52)	(3.57)	(1.31)	(1.70)
MA	0.2335***	0.2326***	0.0325	0.0002
	(3.07)	(3.34)	(0.42)	(0.02)
Restructure	0.2294***	0.1506**	-0.1226	-0.0319***
	(2.76)	(2.06)	(-1.63)	(-3.13)
RD	0.5574***	0.2207	-0.1510	-0.0222
	(2.92)	(1.33)	(-1.07)	(-1.13)
MW	-0.3261**	-0.2115	0.3382*	0.0078
	(-2.35)	(-1.63)	(1.79)	(0.27)
Numanalyst	0.4918**	0.2753		
	(2.35)	(1.48)		
DisAccr			0.3701***	0.0712***
			(3.64)	(5.28)
Horizon			1.7038***	0.0173
			(22.53)	(1.60)
News			0.0353	-0.0076

			(0.51)	(-0.78)
Exeown	0.0224	0.0786	-0.0224	0.0132
	(0.14)	(0.50)	(-0.17)	(0.67)
Holder67	-0.0459	-0.0382	0.0048	0.0092
	(-0.44)	(-0.41)	(0.06)	(0.85)
Tenure	0.2299	0.1085	0.4142**	0.0669***
	(1.09)	(0.56)	(2.20)	(2.66)
Age	-0.1668	-0.1077	0.0318	-0.0041
	(-1.02)	(-0.73)	(0.25)	(-0.23)
Male	0.1638	0.1150	-0.0562	-0.0005
	(0.67)	(0.51)	(-0.32)	(-0.02)
AF	0.1592	0.0480	-0.0877	-0.0012
	(1.22)	(0.41)	(-0.90)	(-0.09)
Law	-0.0260	-0.3216	0.0102	0.0505
	(-0.07)	(-1.00)	(0.05)	(1.54)
Operation	0.2571**	0.1479	0.1169	0.0254**
	(2.33)	(1.52)	(1.39)	(2.25)
Government	0.0419	-0.0181	-0.0847	-0.0069
	(0.26)	(-0.13)	(-0.72)	(-0.44)
Military	0.0304	0.1654	-0.1868	-0.0040
	(0.09)	(0.54)	(-0.85)	(-0.14)
InternalCEO	0.0684	0.0835	-0.0580	-0.0169
	(0.58)	(0.81)	(-0.68)	(-1.41)
Doctorate	0.3913	0.5932*	-0.4107**	-0.0660**
	(1.06)	(1.90)	(-2.27)	(-2.27)
MBA	-0.0112	0.0641	-0.0481	0.0035
	(-0.10)	(0.63)	(-0.58)	(0.29)
GradHonors	-0.3880*	-0.2393	0.2432*	-0.0123
	(-1.78)	(-1.24)	(1.70)	(-0.59)
IvyLeague	0.1321	0.0916	0.1029	0.0032
	(0.94)	(0.77)	(1.10)	(0.24)
Constant	-0.8160	-0.3839	-1.8050*	0.5585***
	(-1.34)	(-1.12)	(-1.87)	(9.68)
Observations	10,908	10,416	21,294	21,294
Year FE	YES	YES	YES	YES
Pseudo R-squared	0.0954	0.0900	0.0992	
Adjusted R-squared				0.082

Panel B

VARIABLES	(1) Issue	(2) BN	(3) Miss	(4) MFE
Extraversion	**0.2942##**	**0.3970###**	**-0.2572###**	**-0.0365###**
	(2.23)	**(3.28)**	**(-2.43)**	**(-2.66)**
Extraversion* IND_MGN	**-0.3019#**	**-0.4440###**	**0.1719**	**0.0429##**
	(-1.63)	**(-2.66)**	**(1.21)**	**(2.20)**
IND_MGN	0.2482##	0.3299###	-0.1007	-0.0218#
	(1.76)	(2.57)	(-0.92)	(-1.44)
Size	-0.1479	-0.0600	-0.1198	-0.0017
	(-0.59)	(-0.27)	(-0.74)	(-0.08)
MB	0.0172	0.1549	0.1339	0.0638***
	(0.10)	(1.05)	(0.92)	(3.29)
LIT	0.5288***	0.3124***	-0.1975**	-0.0206*
	(4.33)	(2.95)	(-2.53)	(-1.92)
LOSS	-0.6825***	-0.5364***	1.0132***	0.1515***
	(-8.03)	(-6.36)	(9.30)	(7.50)
Instown	0.5852***	0.4232***	0.3054**	0.0486***
	(3.73)	(2.99)	(2.42)	(2.59)
Annret	-0.1040	-0.1756**	-0.8837***	-0.1254***
	(-1.32)	(-2.12)	(-7.02)	(-7.60)
Stdret	-1.7586***	-1.7161***	0.4896***	-0.0857***
	(-9.64)	(-10.42)	(2.84)	(-3.67)
EquityIssue	0.2533***	0.1909***	0.0921	0.0169*
	(4.34)	(3.35)	(1.11)	(1.65)
MA	0.2468***	0.2461***	0.0365	0.0003
	(3.22)	(3.51)	(0.47)	(0.03)
Restructure	0.2596***	0.1862**	-0.0783	-0.0289***
	(3.13)	(2.56)	(-1.05)	(-2.89)
RD	0.3938**	0.0294	-0.3467***	-0.0375**
	(2.03)	(0.17)	(-2.60)	(-1.97)
MW	-0.3413**	-0.2313*	0.3302*	0.0090
	(-2.49)	(-1.81)	(1.72)	(0.30)
Numanalyst	0.3854*	0.1466		
	(1.82)	(0.79)		
DisAccr			0.3511***	0.0701***
			(3.47)	(5.18)
Horizon			1.6836***	0.0175
			(22.43)	(1.64)
News			0.0279	-0.0086
			(0.41)	(-0.88)
Exeown	0.0348	0.1005	-0.0135	0.0144
	(0.21)	(0.65)	(-0.10)	(0.73)
Holder67	-0.0678	-0.0652	0.0146	0.0100
	(-0.66)	(-0.70)	(0.18)	(0.93)

	(1)	(2)	(3)	(4)
Tenure	0.2657	0.1551	0.4011**	0.0641**
	(1.28)	(0.81)	(2.18)	(2.57)
Age	-0.1315	-0.0604	0.0514	-0.0031
	(-0.81)	(-0.41)	(0.41)	(-0.18)
Male	0.1552	0.0943	-0.0107	0.0073
	(0.61)	(0.40)	(-0.05)	(0.24)
AF	0.1364	0.0200	-0.1437	-0.0057
	(1.05)	(0.17)	(-1.42)	(-0.42)
Law	-0.0271	-0.3247	-0.0248	0.0457
	(-0.07)	(-1.02)	(-0.12)	(1.42)
Operation	0.2587**	0.1551	0.0966	0.0231**
	(2.33)	(1.59)	(1.10)	(2.01)
Government	0.0156	-0.0558	-0.0851	-0.0044
	(0.10)	(-0.40)	(-0.72)	(-0.29)
Military	0.0585	0.1923	-0.1658	-0.0027
	(0.17)	(0.62)	(-0.79)	(-0.10)
InternalCEO	0.0904	0.1069	-0.0015	-0.0115
	(0.77)	(1.04)	(-0.02)	(-0.95)
Doctorate	0.3689	0.5599*	-0.4438**	-0.0678**
	(1.01)	(1.80)	(-2.29)	(-2.31)
MBA	0.0195	0.1061	-0.0543	0.0014
	(0.17)	(1.04)	(-0.64)	(0.12)
GradHonors	-0.3765*	-0.2247	0.2538*	-0.0122
	(-1.71)	(-1.14)	(1.77)	(-0.60)
IvyLeague	0.1262	0.0859	0.1005	0.0022
	(0.89)	(0.72)	(1.03)	(0.17)
Constant	-0.9598	-0.5624	-1.9099*	0.5458***
	(-1.59)	(-1.62)	(-1.86)	(8.91)
Observations	10,908	10,416	21,294	21,294
Year FE	YES	YES	YES	YES
Pseudo R-squared	0.0926	0.0862	0.0935	
Adjusted R-squared				0.080

Note: Table 4 Panel A report the regression results when *IND_NUM* is the proxy for industry level proprietary cost of voluntary disclosure. Table 4 Panel A columns (1), (2), and (3) report the logit regression results of models (4a) (4b) and (4c) as described in Section 4. Column (4) of Table 4 Panel A reports the OLS regression result of model (4d) as described in section 4.

Table 4 Panel B report the regression results when *IND_MGN* is the proxy for industry level proprietary cost of voluntary disclosure. Table 4 Panel B columns (1), (2), and (3) report the logit regression results of models (4a) (4b) and (4c) as described in Section 4. Column (4) of Table 4 Panel A reports the OLS regression result of model (4d) as described in Section 4.

Variables are as defined in Appendix A. Standard errors are clustered by firm. In columns (1), (2), and (3) of both Panel A and Panel B, z-statistics based on robust standard errors are reported in parentheses. In column (4) of both Panel A and Panel B, t-statistics based on robust standard errors are reported in parentheses.

***, **, and * denote statistical significance at 1%, 5%, and 10% levels (two-tailed), respectively.
###, ##, and # denote statistical significance at 1%, 5%, and 10% levels (one-tailed), respectively.

Table 5: The Impact of High Litigation Risk on the Relationship Between CEO Extraversion and Management Earnings Forecasts

VARIABLES	(1) Issue	(2) BN	(1) Miss	(2) MFE
Extraversion	**0.2472##**	**0.2931###**	**-0.2880###**	**-0.0319###**
	(1.98)	**(2.56)**	**(-2.97)**	**(-2.53)**
Extraversion* LIT	**-0.2869#**	**-0.3240##**	**0.3188##**	**0.0472###**
	(-1.37)	**(-1.77)**	**(2.22)**	**(2.41)**
LIT	0.6762###	0.4808###	-0.3598###	-0.0455###
	(4.37)	(3.56)	(-3.23)	(-2.94)
Size	-0.1844	-0.0967	-0.1333	-0.0047
	(-0.74)	(-0.44)	(-0.82)	(-0.21)
MB	0.0169	0.1516	0.1441	0.0655***
	(0.10)	(1.03)	(0.99)	(3.37)
LOSS	-0.6768***	-0.5293***	1.0065***	0.1503***
	(-7.97)	(-6.28)	(9.20)	(7.44)
Instown	0.5879***	0.4308***	0.3026**	0.0478**
	(3.75)	(3.04)	(2.39)	(2.54)
Annret	-0.1071	-0.1776**	-0.8869***	-0.1266***
	(-1.37)	(-2.16)	(-7.01)	(-7.64)
Stdret	-1.7562***	-1.7105***	0.4666***	-0.0906***
	(-9.63)	(-10.40)	(2.71)	(-3.85)
EquityIssue	0.2498***	0.1857***	0.0955	0.0172*
	(4.29)	(3.27)	(1.15)	(1.69)
MA	0.2437***	0.2397***	0.0419	0.0011
	(3.19)	(3.43)	(0.54)	(0.11)
Restructure	0.2615***	0.1869**	-0.0794	-0.0290***
	(3.15)	(2.57)	(-1.06)	(-2.88)
RD	0.4456**	0.0865	-0.3440***	-0.0358**
	(2.39)	(0.53)	(-2.67)	(-1.97)
MW	-0.3367**	-0.2250*	0.3316*	0.0091
	(-2.47)	(-1.78)	(1.73)	(0.31)
Numanalyst	0.4112*	0.1697		
	(1.94)	(0.91)		
DisAccr			0.3532***	0.0705***
			(3.48)	(5.20)
Horizon			1.6835***	0.0168
			(22.25)	(1.55)
News			0.0293	-0.0083
			(0.43)	(-0.85)
Exeown	0.0338	0.0997	-0.0145	0.0141
	(0.20)	(0.64)	(-0.11)	(0.71)
Holder67	-0.0548	-0.0492	0.0144	0.0103
	(-0.53)	(-0.53)	(0.18)	(0.95)
Tenure	0.2475	0.1273	0.3981**	0.0643***

	(1)	(2)	(3)	(4)
	(1.17)	(0.66)	(2.18)	(2.59)
Age	-0.1407	-0.0712	0.0575	-0.0036
	(-0.87)	(-0.48)	(0.46)	(-0.20)
Male	0.1733	0.1227	-0.0263	0.0037
	(0.69)	(0.52)	(-0.13)	(0.12)
AF	0.1291	0.0119	-0.1344	-0.0039
	(0.99)	(0.10)	(-1.32)	(-0.28)
Law	-0.0371	-0.3398	0.0262	0.0548*
	(-0.10)	(-1.07)	(0.13)	(1.75)
Operation	0.2544**	0.1461	0.1000	0.0240**
	(2.29)	(1.49)	(1.15)	(2.08)
Government	0.0263	-0.0371	-0.0929	-0.0068
	(0.16)	(-0.27)	(-0.79)	(-0.44)
Military	0.0455	0.1771	-0.1729	-0.0031
	(0.14)	(0.58)	(-0.83)	(-0.12)
InternalCEO	0.0900	0.1081	-0.0108	-0.0132
	(0.77)	(1.05)	(-0.13)	(-1.09)
Doctorate	0.3660	0.5593*	-0.4690**	-0.0729**
	(1.00)	(1.81)	(-2.45)	(-2.56)
MBA	0.0044	0.0845	-0.0420	0.0032
	(0.04)	(0.84)	(-0.50)	(0.26)
GradHonors	-0.3826*	-0.2303	0.2606*	-0.0117
	(-1.74)	(-1.17)	(1.79)	(-0.57)
IvyLeague	0.1275	0.0861	0.1095	0.0041
	(0.90)	(0.72)	(1.12)	(0.31)
Constant	-0.9217	-0.4842	-1.9058*	0.5486***
	(-1.55)	(-1.40)	(-1.85)	(8.89)
Observations	10,908	10,416	21,294	21,294
Year FE	YES	YES	YES	YES
Pseudo R-squared	0.0921	0.0848	0.0941	
Adjusted R-squared				0.080

Note: Table 5 columns (1), (2), and (3) report the logit regression results of models (5a) (5b) and (5c) as described in Section 4. Column (4) of Table 5 reports the OLS regression result of model (5d) as described in Section 4.

Variables are as defined in Appendix A. Standard errors are clustered by firm. In columns (1), (2), and (3), z-statistics based on robust standard errors are reported in parentheses. In column (4), t-statistics based on robust standard errors are reported in parentheses.

***, **, and * denote statistical significance at 1%, 5%, and 10% levels (two-tailed), respectively.
###, ##, and # denote statistical significance at 1%, 5%, and 10% levels (one-tailed), respectively.

Table 6: Main Analyses with Residual CEO Extraversion

VARIABLES	(1) Issue	(2) BN	(3) Miss	(4) MFE
Residual_Extra	0.1786##	0.1773##	-0.1835###	-0.0143#
	(1.78)	(1.96)	(-2.52)	(-1.45)
Size	-0.1533	-0.0653	-0.1723	-0.0069
	(-0.62)	(-0.29)	(-1.07)	(-0.31)
MB	0.0227	0.1627	0.1496	0.0659***
	(0.14)	(1.11)	(1.03)	(3.40)
LIT	0.5444***	0.3264***	-0.2010***	-0.0209*
	(4.51)	(3.12)	(-2.59)	(-1.95)
LOSS	-0.6772***	-0.5308***	1.0117***	0.1507***
	(-7.95)	(-6.27)	(9.22)	(7.38)
Instown	0.5956***	0.4419***	0.3042**	0.0475**
	(3.79)	(3.11)	(2.41)	(2.52)
Annret	-0.1101	-0.1791**	-0.8874***	-0.1267***
	(-1.41)	(-2.17)	(-7.05)	(-7.67)
Stdret	-1.7542***	-1.7072***	0.4606***	-0.0897***
	(-9.61)	(-10.37)	(2.69)	(-3.81)
EquityIssue	0.2511***	0.1883***	0.0919	0.0168
	(4.31)	(3.31)	(1.11)	(1.64)
MA	0.2412***	0.2392***	0.0374	0.0003
	(3.14)	(3.40)	(0.48)	(0.03)
Restructure	0.2577***	0.1825**	-0.0783	-0.0285***
	(3.11)	(2.51)	(-1.05)	(-2.83)
RD	0.4486**	0.0853	-0.3524***	-0.0370**
	(2.41)	(0.53)	(-2.73)	(-2.03)
MW	-0.3349**	-0.2231*	0.3267*	0.0085
	(-2.44)	(-1.75)	(1.70)	(0.29)
Numanalyst	0.3994*	0.1650		
	(1.89)	(0.89)		
DisAccr			0.3502***	0.0702***
			(3.46)	(5.19)
Horizon			1.6778***	0.0162
			(22.28)	(1.50)
News			0.0300	-0.0083
			(0.44)	(-0.84)
Exeown	0.0342	0.0973	-0.0278	0.0134
	(0.21)	(0.62)	(-0.21)	(0.67)
Holder67	-0.0577	-0.0523	0.0130	0.0100
	(-0.56)	(-0.56)	(0.16)	(0.94)
Tenure	0.2302	0.1098	0.4154**	0.0665***
	(1.09)	(0.57)	(2.26)	(2.67)
Age	-0.1279	-0.0632	0.0496	-0.0041
	(-0.79)	(-0.43)	(0.40)	(-0.24)

Male	0.1614	0.1138	-0.0299	0.0021
	(0.65)	(0.49)	(-0.15)	(0.07)
AF	0.1358	0.0212	-0.1363	-0.0044
	(1.05)	(0.18)	(-1.34)	(-0.32)
Law	-0.0339	-0.3296	-0.0053	0.0498
	(-0.09)	(-1.05)	(-0.03)	(1.61)
Operation	0.2493**	0.1416	0.1061	0.0247**
	(2.25)	(1.45)	(1.23)	(2.14)
Government	0.0226	-0.0383	-0.0914	-0.0065
	(0.14)	(-0.27)	(-0.78)	(-0.42)
Military	0.0325	0.1598	-0.1446	0.0017
	(0.10)	(0.53)	(-0.69)	(0.07)
InternalCEO	0.0909	0.1090	0.0005	-0.0120
	(0.78)	(1.06)	(0.01)	(-1.00)
Doctorate	0.3535	0.5441*	-0.4403**	-0.0692**
	(0.98)	(1.78)	(-2.36)	(-2.54)
MBA	0.0033	0.0832	-0.0468	0.0028
	(0.03)	(0.82)	(-0.55)	(0.23)
GradHonors	-0.3752*	-0.2185	0.2508*	-0.0140
	(-1.70)	(-1.11)	(1.74)	(-0.68)
IvyLeague	0.1374	0.0944	0.0966	0.0023
	(0.97)	(0.79)	(1.00)	(0.18)
Constant	-0.9040	-0.4321	-1.9042*	0.5476***
	(-1.52)	(-1.27)	(-1.83)	(8.62)
Observations	10,908	10,416	21,294	21,294
Year FE	YES	YES	YES	YES
Pseudo R-squared	0.0917	0.0840	0.0935	
Adjusted R-squared				0.079

Note: Table 6 reports the regression results for the tests of my first and second set of hypotheses using the residual CEO extraversion (*Residual_Extra*). I obtain the residual CEO extraversion by running the determinant regression model (6) of a firm's decision to choose a CEO with certain level of extraversion. The columns (1), (2), (3), and (4) of Table 6 are estimated based on regression models (1), (1b), (2a), and (2b) in Section 4 respectively and replace the original measure of CEO extraversion (*Extraversion*) with the residual CEO extraversion (*Residual_Extra*).

Variables are as defined in Appendix A. Standard errors are clustered by firm. In columns (1), (2), and (3), z-statistics based on robust standard errors are reported in parentheses. In column (4), t-statistics based on robust standard errors are reported in parentheses.

***, **, and * denote statistical significance at 1%, 5%, and 10% levels (two-tailed), respectively.

###, ##, and # denote statistical significance at 1%, 5%, and 10% levels (one-tailed), respectively.

Table 7: Heckman Second Stage
The Impact of CEO Extraversion on the Bias of Management Forecasts

VARIABLES	(1) Miss	(2) MFE
Extraversion	**-0.1647##**	**-0.0137#**
	(-2.12)	**(-1.36)**
Size	-0.0991	-0.0002
	(-0.54)	(-0.01)
MB	0.1544	0.0653***
	(0.99)	(2.97)
LIT	-0.1690	-0.0184
	(-1.17)	(-0.91)
LOSS	0.9490***	0.1434***
	(3.92)	(3.87)
Instown	0.3351**	0.0517**
	(1.96)	(2.16)
Annret	-0.8877***	-0.1271***
	(-6.97)	(-7.58)
Stdret	0.3683	-0.0991*
	(0.85)	(-1.66)
EquityIssue	0.1050	0.0188
	(1.11)	(1.57)
MA	0.0494	0.0010
	(0.53)	(0.08)
Restructure	-0.0627	-0.0271**
	(-0.74)	(-2.31)
RD	-0.3333**	-0.0355*
	(-2.36)	(-1.76)
MW	0.3208	0.0118
	(1.57)	(0.37)
DisAccr	0.3417***	0.0688***
	(3.37)	(5.08)
Horizon	1.6736***	0.0151
	(22.16)	(1.40)
News	0.0302	-0.0092
	(0.44)	(-0.94)
Exeown	0.0011	0.0153
	(0.01)	(0.76)
Holder67	0.0180	0.0108
	(0.22)	(1.00)
Tenure	0.4047**	0.0656***
	(2.20)	(2.63)
Age	0.0302	-0.0070
	(0.22)	(-0.37)
Male	-0.0276	0.0027

	(-0.14)	(0.09)
AF	-0.1399	-0.0044
	(-1.37)	(-0.32)
Law	0.0470	0.0547*
	(0.22)	(1.73)
Operation	0.0956	0.0245**
	(1.10)	(2.12)
Government	-0.0974	-0.0074
	(-0.82)	(-0.48)
Military	-0.1346	0.0042
	(-0.65)	(0.16)
InternalCEO	-0.0000	-0.0121
	(-0.00)	(-0.99)
Doctorate	-0.5066**	-0.0739***
	(-2.55)	(-2.63)
MBA	-0.0495	0.0023
	(-0.58)	(0.18)
GradHonors	0.2353	-0.0159
	(1.62)	(-0.77)
IvyLeague	0.1033	0.0021
	(1.06)	(0.16)
IMR	-0.2793	-0.0248
	(-0.28)	(-0.16)
Constant	-1.9588*	0.5452***
	(-1.87)	(7.75)
Observations	21,195	21,195
Year FE	YES	YES
Pseudo R-squared	0.0927	
Adjusted R-squared		0.078

Note: Table 7 reports the regression results for the second-stage of the Heckman (1979) procedure, testing my second set of hypotheses. The columns (1) and (2) of Table 7 are estimated based on regression models (2a) and (2b) in Section 4, respectively, by adding IMR as additional control variable in each model. *IMR* is estimated in the first stage of the Heckman (1979) procedure. Variables are as defined in Appendix A. Standard errors are clustered by firm. In column (1), z-statistics based on robust standard errors are reported in parentheses. In column (2), t-statistics based on robust standard errors are reported in parentheses.
***, **, and * denote statistical significance at 1%, 5%, and 10% levels (two-tailed), respectively.
###, ##, and # denote statistical significance at 1%, 5%, and 10% levels (one-tailed), respectively.

Table 8: Main Analyses with Additional Four CEO Personality Traits

VARIABLES	(1) Issue	(2) BN	(1) Miss	(2) MFE
Extraversion	**0.1694#**	**0.1901##**	**-0.1665##**	**-0.0157#**
	(1.59)	**(2.01)**	**(-2.02)**	**(-1.40)**
Size	-0.2060	-0.0999	-0.1116	-0.0024
	(-0.82)	(-0.45)	(-0.69)	(-0.11)
MB	0.0213	0.1639	0.1384	0.0645***
	(0.13)	(1.11)	(0.95)	(3.33)
LIT	0.5327***	0.3226***	-0.1987**	-0.0209*
	(4.38)	(3.07)	(-2.55)	(-1.92)
LOSS	-0.6741***	-0.5274***	1.0077***	0.1507***
	(-7.89)	(-6.22)	(9.20)	(7.45)
Instown	0.5924***	0.4452***	0.3036**	0.0461**
	(3.77)	(3.13)	(2.38)	(2.40)
Annret	-0.1123	-0.1803**	-0.8896***	-0.1268***
	(-1.44)	(-2.19)	(-7.06)	(-7.70)
Stdret	-1.7653***	-1.7145***	0.4801***	-0.0874***
	(-9.65)	(-10.38)	(2.79)	(-3.71)
EquityIssue	0.2538***	0.1879***	0.0931	0.0175*
	(4.35)	(3.30)	(1.12)	(1.70)
MA	0.2428***	0.2428***	0.0348	-0.0002
	(3.16)	(3.44)	(0.45)	(-0.02)
Restructure	0.2513***	0.1776**	-0.0784	-0.0280***
	(3.03)	(2.44)	(-1.05)	(-2.78)
RD	0.4355**	0.0793	-0.3470***	-0.0382**
	(2.33)	(0.49)	(-2.69)	(-2.09)
MW	-0.3327**	-0.2188*	0.3286*	0.0077
	(-2.43)	(-1.71)	(1.71)	(0.26)
Numanalyst	0.4103*	0.1640		
	(1.93)	(0.88)		
DisAccr			0.3553***	0.0702***
			(3.51)	(5.21)
Horizon			1.6790***	0.0165
			(22.38)	(1.54)
News			0.0292	-0.0084
			(0.42)	(-0.85)
Exeown	0.0301	0.0960	-0.0148	0.0143
	(0.18)	(0.62)	(-0.11)	(0.72)
Holder67	-0.0513	-0.0496	0.0108	0.0102
	(-0.50)	(-0.53)	(0.13)	(0.95)
Tenure	0.2394	0.1201	0.4083**	0.0638**
	(1.14)	(0.62)	(2.24)	(2.57)
Age	-0.1379	-0.0700	0.0476	-0.0046
	(-0.85)	(-0.47)	(0.38)	(-0.26)

Male	0.1743	0.1151	-0.0287	0.0011
	(0.69)	(0.49)	(-0.15)	(0.04)
AF	0.1419	0.0235	-0.1358	-0.0043
	(1.09)	(0.21)	(-1.34)	(-0.31)
Law	-0.0112	-0.3068	-0.0233	0.0467
	(-0.03)	(-0.96)	(-0.11)	(1.45)
Operation	0.2553**	0.1501	0.1031	0.0248**
	(2.31)	(1.54)	(1.17)	(2.15)
Government	0.0254	-0.0357	-0.0917	-0.0063
	(0.16)	(-0.25)	(-0.78)	(-0.42)
Military	0.0412	0.1633	-0.1485	-0.0008
	(0.12)	(0.54)	(-0.71)	(-0.03)
InternalCEO	0.0973	0.1051	-0.0037	-0.0115
	(0.83)	(1.01)	(-0.04)	(-0.96)
Doctorate	0.3442	0.5421*	-0.4429**	-0.0689**
	(0.93)	(1.76)	(-2.35)	(-2.37)
MBA	0.0092	0.0875	-0.0471	0.0025
	(0.08)	(0.86)	(-0.56)	(0.21)
GradHonors	-0.3770*	-0.2129	0.2472*	-0.0157
	(-1.71)	(-1.09)	(1.74)	(-0.78)
IvyLeague	0.1174	0.0850	0.0996	0.0010
	(0.83)	(0.71)	(1.01)	(0.08)
Emotional_stability	-0.0679	-0.0878	0.0253	0.0060
	(-0.62)	(-0.89)	(0.31)	(0.49)
Conscientiousness	0.1000	0.0055	-0.0324	0.0053
	(0.85)	(0.05)	(-0.40)	(0.44)
Openness	-0.1444	-0.0415	0.0180	-0.0144
	(-1.32)	(-0.42)	(0.24)	(-1.35)
Agreeableness	0.0014	0.0527	-0.0146	0.0011
	(0.01)	(0.51)	(-0.17)	(0.09)
Constant	-0.8021	-0.3859	-1.9193*	0.5458***
	(-1.35)	(-1.13)	(-1.86)	(8.43)
Observations	10,908	10,416	21,294	21,294
Year FE	YES	YES	YES	YES
Pseudo R-squared	0.0922	0.0842	0.0933	
Adjusted R-squared				0.079

Note: Table 8 reports the regression results for the tests of my first and second set of hypotheses with additional four CEO personality traits (that are *Emotional_stability, Conscientiousness, Openness,*and *Agreeableness*) included in the regression models. The columns (1) - (4) of Table 8 are estimated based on regression models (1), (1b), (2a), and (2b) in Section 4 respectively with additional CEO personality traits added.

Variables are as defined in Appendix A. Standard errors are clustered by firm. In columns (1)-(3), z-statistics based on robust standard errors are reported in parentheses. In column (4), t-statistics based on robust standard errors are reported in parentheses.

***, **, and * denote statistical significance at 1%, 5%, and 10% levels (two-tailed), respectively.
###, ##, and # denote statistical significance at 1%, 5%, and 10% levels (one-tailed), respectively.

Table 9: Market Reaction to Management Earnings Forecasts

Variables	Panel A: Full sample Parameter Estimates	Panel B: Subsample Parameter Estimates
Intercept	0.0261***	-0.0077*
	(10.46)	(-1.83)
News	8.7034***	7.0273***
	(22.16)	(12.18)
News*Extraversion	**0.7097***	**0.5961**
	(4.31)	**(2.43)**
News*Size	-0.5476***	-0.4114***
	(-11.04)	(-5.77)
News*MB	0.1896***	0.1592***
	(8.89)	(5.15)
News*Loss	-2.5463***	-1.9448***
	(-15.69)	(-8.32)
Extraversion	0.0013	0.0006
	(1.31)	(0.41)
Size	-0.0022***	0.0011**
	(-7.31)	(2.12)
MB	-0.0001	-0.0004**
	(-0.54)	(-2.18)
Loss	-0.0148***	-0.0229***
	(-8.42)	(-7.79)
Number of Observations	41,002	12,565
Adjusted R-Square	0.0744	0.0828

Note: Table 9 Panel A reports the OLS regression result of model (6) on the sample of firms which issue forecasts as described in section 5.4. Table 9 Panel B reports the OLS regression result of model (6) on the subsample of firms which issue non-bundled forecasts. The dependent variable *RET (0,2)* is the three-day compound stock returns, starting at the management earnings forecast announcement date. *News* is the management forecasted earnings minus prevailing analysts' consensus forecast earnings, scaled by beginning of year stock price. Variables are as defined in Appendix A.
***, **, and * denote statistical significance at 1%, 5%, and 10% levels (two-tailed), respectively.