

CSR, MANAGERIAL OVERCONFIDENCE AND RISK-TAKING INCENTIVES

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To everyone who has shaped the person I am today



DECLARATION OF ORIGINALITY

I hereby declare that I am the sole author of this thesis and that this is the true copy of my thesis, including the final revisions, approved by my thesis committee. All data and information have been obtained, produced, and presented in accordance with the rules of research ethics and principles of academic honesty. As required by these rules, to the best of my knowledge I have acknowledged ideas, thoughts, and any copyrighted material in accordance with the standard referencing rules. I certify that any part of this thesis has not been submitted for a degree or diploma in another educational institution.

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ABSTRACT

The importance of corporate social responsibility (CSR) in firm management has grown substantially. Although research on managerial overconfidence and risk-taking incentives has expanded since the early 2000s, it has largely overlooked the role of Chief Financial Officers (CFOs). Another underexplored area is managerial pessimism, as most studies focus solely on CEO overconfidence. This dissertation, comprising two studies on corporate CSR performance based on firm and fixed effects models, addresses these gaps by integrating the roles of CFOs and managerial pessimism into the analysis. The first study investigates the independent and joint effects of CEO and CFO overconfidence and pessimism on CSR performance. The second study investigates the effect of CEO and CFO risk-taking incentives (delta and vega) on CSR performance, with overconfidence and pessimism introduced as moderating variables. Both studies span the period from 2006 to 2022 and a sub-sample from 2011 to 2019 to isolate the effects of the post-global financial crisis (GFC) and the COVID-19 pandemic. They contribute to the literature by demonstrating the significant effect of CFOs in CSR policymaking. Furthermore, balanced executive teams, comprising an overconfident and pessimistic executive exhibit a negative effect on environmental (E) scores but a positive effect on social (S) and overall ESG scores. The findings also reveal that executive vega, when interacted with overconfidence, negatively affects CSR performance, whereas it has a positive effect when interacted with pessimism.

Keywords: Overconfidence, pessimism, risk-taking incentives, CSR, CFO

ÖZET

Şirket yönetiminde kurumsal sosyal sorumluluğun (KSS) önemi önemli ölçüde artmıştır. Yönetsel aşırı özgüven ve risk alma teşviklerine ilişkin araştırmalar 2000’li yılların başından itibaren genişlemiş olsa da, bu çalışmalar büyük ölçüde Mali İşler Müdürlerinin (CFO) firma politikaları üzerindeki rolünü göz ardı etmiştir. Yetersiz incelenmiş bir diğer alan ise yönetsel kötümserliktir; zira mevcut çalışmaların çoğu yalnızca CEO’ların aşırı özgüvenine odaklanmaktadır. Firma ve yıl sabit etkili modeller üzerine kurulu iki çalışmadan oluşan bu doktora tezi, CFO’ların ve yönetsel kötümserliğin rollerini analiz sürecine entegre ederek bu boşlukları ele almaktadır. İlk çalışma, CEO ve CFO’nun aşırı özgüveni ile kötümserliğinin KSS performansı üzerindeki bağımsız ve ortak etkilerini incelemektedir. İkinci çalışma ise CEO ve CFO’nun risk alma teşviklerinin (delta ve vega) KSS performansına etkisini analiz ederken, aşırı özgüven ve kötümserliği etkileşim değişkenleri olarak dâhil etmektedir. Her iki çalışma da 2006–2022 dönemini kapsamakta olup, küresel finansal kriz ve COVID-19 sonrası etkileri izole etmek amacıyla 2011–2019 yıllarına ait bir alt örneklem de analiz edilmiştir. Çalışmalar, CFO’ların KSS politika oluşturmadaki belirleyici etkisini ortaya koyarak literatüre katkı sağlamaktadır. Ayrıca, biri aşırı özgüvenli ve diğeri kötümser olan yöneticilerden oluşan dengeli üst yönetim ekiplerinin çevresel (E) skorlar üzerinde olumsuz, sosyal (S) ve genel ESG skorları üzerinde ise olumlu etkileri olduğu bulunmuştur. Bulgular ayrıca, yöneticinin vegası aşırı özgüvenle etkileşime girdiğinde KSS performansını olumsuz etkilerken, kötümserlikle etkileşime girdiğinde olumlu etkilediğini ortaya koymaktadır.

Anahtar Kelimeler: Aşırı özgüven, kötümserlik, risk alma teşvikleri, kurumsal sosyal sorumluluk (KSS), mali işler direktörü (CFO)

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LIST OF ACRONYMS AND ABBREVIATIONS

CSR: Corporate Social Responsibility

UNEX: Unexercised

EXER: Exercisable

STD. DEV: Standard Deviation

OBS: Observations

ROA: Return on Assets

ESG: Environmental Social Governance

OPA: Optimism Prevails Assumption

CCA: Count Comparison Assumption

E: Environmental

S: Social

G: Governance

OPT: Optimism

PESS: Pessimism

LIST OF SYMBOLS

N: Cumulative probability function for the normal distribution

S: Price of the underlying stock

X: Exercise price of the option

σ : Expected stock-return volatility over the life of the option

r: Natural logarithm of risk-free interest rate

T: Time to maturity of the option in years

d: Natural logarithm of expected dividend yield over the life of the option

N': Normal density function

1. INTRODUCTION

This dissertation encompasses two distinct studies: the first examines the effect of managerial overconfidence (and pessimism) on corporate social responsibility (CSR) performance; the second investigates the impact of managerial risk-taking incentives (delta and vega) on CSR performance, with overconfidence and pessimism introduced as moderating variables.

Friedman (1970) claims that the mere responsibility of business is to make a profit; since then, there has been a major shift in the importance attributed to stakeholders by firms. Freeman (1984) lays the theoretical grounds for corporate social responsibility (CSR) with stakeholder theory, arguing that a firm should create value for stakeholders and shareholders. On August 19, 2019, Business Roundtable (Johnson, 2019), an association of CEOs of America's largest companies, redefined corporate purpose as stakeholder and shareholder value. The new purpose now also embraces customer value, investing in employees, fair and ethical supplier relationships, and care for the community and environment.

Throughout this dissertation, the two distinct studies are presented under separate subheadings. This chapter introduces the overall research framework and details the hypotheses and the underlying rationale for both studies, while Chapter 2 provides a comprehensive review of the relevant literature. Chapters 3 and 4 present the data, variables, methodology, results, and robustness checks for the first and second studies, respectively. The closing chapter summarizes the key findings and contributions of the research.

1.1 CSR and Managerial Overconfidence (Pessimism)

Managerial overconfidence has been studied since the early 2000s (Malmendier and Tate, 2005,2008; Heaton, 2002) regarding its effects on firm performance and management. Studies on the impact of CEO overconfidence on CSR performance started in the following decade (McCarthy et al., 2017; Tang et al., 2015), with the growing relevance of CSR for firm management and value generation. Malmendier et al. (2023) raise the issue that focusing only on CEO overconfidence may lead to the misattribution of CFO overconfidence effect on CEOs. The primary aim of this study is to overcome such shortcomings by entailing CFOs and CEO-CFO interaction in investigating the effects of individual and team overconfidence and pessimism on CSR performance. The secondary aim of this paper is to involve pessimism in studying CSR as a managerial trait. Campbell et al. (2011) and Eichholtz and Yonder (2023) are a few studies that involve different levels of overconfidence and pessimism. The aforementioned CSR vis-à-vis overconfidence research only involves overconfidence, excluding pessimism. The third aim is to analyze how the effects of pessimism and overconfidence evolve during periods following uncertainty. McCarthy et al. (2017) and Tang et al. (2015) assess managerial overconfidence's single-period effect on CSR.

This study entails a panel data fixed effects study of US-listed non-financial firms in two sample periods. The 2006 to 2022 study includes 1685 firms, 3795 CEOs and 4340 CFOs. 2011 to 2019 analysis involves 1596 firms, 2725 CEOs and 3022 CFOs.

I find a negative relationship between individual overconfidence and CSR for the 2006 to 2022 period and that such a relationship becomes insignificant during the post-GFC (The Great Financial Crisis) period. The study provides strong evidence regarding the positive effect of individual pessimism on CSR. Regarding the effects of teams, I find

that balanced teams comprising an overconfident CEO (CFO) and a pessimistic CFO (CEO) have adverse effects on environmental scores in contrast to positive effects on social and ESG scores from 2011 to 2019.

1.1.1. Hypotheses

Overconfident managers are prone to excess risk-taking (Heaton, 2002; Adam et al., 2015), and CSR can serve as a hedging policy (Godfrey, 2005; Godfrey et al., 2009). Due to CSR's product differentiation nature, pessimistic (overconfident) managers, owing to their negative outlook for the firm's prospects, may tend to enhance (weaken) CSR policy to maximize firm profits and expand the customer base. Combining these theories and arguments, one would expect an overconfident (pessimistic) CEO or CFO to have a negative (positive) effect on the corporate social responsibility (CSR) performance of the firm.

Hypothesis 1A: CEO or CFO overconfidence has negative effect on the corporate social responsibility (CSR) performance of the firm.

Hypothesis 1B: CEO or CFO pessimism has positive effect on the corporate social responsibility (CSR) performance of the firm.

CSR works as an efficient insurance mechanism by generating social capital during times of crisis. (Lins et al., 2017) This could mitigate (exacerbate) the effects of overconfident (pessimistic) managers on CSR policy at such challenging times. Also, following the resource dependence theory, as Tang et al. (2015) argue, managers would be expected to resort to stakeholders for support when resources are scarce. These assertions and theories imply that during the post-GFC period, one could expect a weaker (stronger) link between CSR and overconfidence (pessimism).

Hypothesis 2A: The effect of CEO or CFO overconfidence on the corporate social responsibility (CSR) performance of the firm is weaker or less significant for the post-GFC period.

Hypothesis 2B: The effect of CEO or CFO pessimism on the corporate social responsibility (CSR) performance of the firm is stronger or more significant for the post-GFC period.

Eichholtz and Yonder (2023) study US REITs concerning their investments in commercial real estate. They find that firms led by optimistic CEO/CFO teams pay 3% more than their peers for their asset acquisitions if the cash ratio increases by one percentage point, while overpayment is not observed with firms led by balanced teams. Similarly, I expect the effect of the optimistic versus balanced team on CSR performance to mimic the behavior of overconfident individuals. According to Eichholtz and Yonder (2023) optimistic teams are defined as having both executives classified as overconfident, whereas balanced teams consist of one overconfident executive and one pessimistic executive.

Hypothesis 3A: Optimistic Teams have a negative effect on the corporate social responsibility (CSR) performance of the firm.

Hypothesis 3B: Balanced teams do not have a significant effect on the corporate social responsibility (CSR) of the firm.

Year and firm fixed effects model is employed for all the models, and the standard errors are clustered by firm following McCarthy et al. (2017), Tang et al. (2015), and Borghesi et al. (2014). All the dependent variables are included in the models with one period lag following McCarthy et al. (2017) and Tang et al. (2015)

The four measures of optimism and pessimism are utilized as key independent variables under the count comparison assumption (CCA), and the optimism prevails assumption (OPA) for individual executive and team models.

1.2 CSR, Managerial-Risk Taking Incentives and Overconfidence (Pessimism)

Research on the relationship between executive compensation and CSR dates back to the early 2000s, with initial studies primarily focusing on flow compensation components. Notably, McGuire et al. (2003), Deckop et al. (2006), and Mahoney and Thorne (2005) investigate the impact of long-term incentives—specifically stock options—on CSR activities. However, their findings are inconsistent: McGuire et al. (2003) report that stock options discourage CSR engagement, while Deckop et al. (2006) and Mahoney and Thorne (2005) find that stock options may encourage CSR participation. In more recent years, this line of inquiry has evolved, shifting the focus from flow compensation to risk-taking incentives, namely delta and vega (Mayberry, 2020; Fabrizi et al., 2014; McGuire et al., 2019; Ikram et al., 2017). However, this nascent strand of research also continues to yield conflicting evidence. Mayberry (2020), using a quasi-natural experiment around the FAS 123R regulatory change to mitigate endogeneity concerns, finds that a decline in vega—resulting from firms cutting back on stock option grants—leads to a reduction in CSR weaknesses, although it does not significantly affect CSR strengths. In contrast, Fabrizi et al. (2014) examine the influence of executive bonuses, delta, and non-financial motivations on CSR using a sample of U.S. companies from 2005 to 2009, with CSR data sourced from EIRIS. Their results indicate an adverse effect of delta on CSR performance, opposing Mayberry’s conclusions. Similarly, McGuire et al. (2019) find that CEO delta is negatively associated with poor and strong social performance, implying a dampening effect on overall CSR engagement. Meanwhile,

Ikram et al. (2017) report that delta has no significant impact on CSR but find a strong and positive causal relationship between vega and CSR engagement.

First, this paper approaches the research question from a novel angle by introducing managerial overconfidence as a moderating variable in the relationship between risk-taking incentives and CSR. As demonstrated by McCarthy et al. (2017) and the findings presented in the first study of this dissertation, managerial overconfidence and pessimism significantly influence CSR performance. By incorporating this executive characteristic, the study seeks to clarify the inconsistent results found in the existing literature and provide a more nuanced understanding of how risk-taking incentives interact with executive traits to shape CSR outcomes.

Secondly, as noted by Fabrizi et al. (2014), CEOs tend to exert a more substantial influence on CSR policy. This explains why existing literature on executive compensation and CSR has primarily focused on CEOs, often overlooking the role of CFOs. However, evidence from Chava and Purnanandam (2010) demonstrates that CFOs' risk-taking incentives significantly affect firm risk. Given that CSR is frequently conceptualized as a risk management tool (Godfrey, 2005; 2009), it is reasonable to expect that CFOs' risk-taking incentives may influence CSR performance. Furthermore, Deloitte (2023) emphasizes that CFOs and other finance leaders are pivotal to the transition toward sustainability, as they play a vital role in corporate decision-making. They are increasingly seen as sustainability champions, serving as role models and strategic leaders who guide organizations toward long-term sustainable success. McKinsey&Company (2023) notes that CFOs want to be more actively involved in ESG initiatives. It cites data showing that when CFOs are engaged in ESG topics, there is a 20- to 30-percentage-point higher alignment between ESG initiatives and a firm's strategic goals. Considering these

insights, this study extends prior research by examining the role of CFO risk-taking incentives in shaping CSR policies, particularly in interaction with executive overconfidence and pessimism.

Third, sample sizes in several existing studies are notably limited. For example, Mayberry's (2020) analysis is confined to a narrow six-year window—three years before and after the FAS 123R regulatory change. Similarly, Fabrizi et al. (2014) restrict their sample to the 2005–2009 period, while McGuire et al. (2019) examine only 84 S&P 100 firms over 2006–2011, resulting in just 467 firm-year observations (**OBS**). This study addresses these limitations by employing a broader dataset. The main sample spans 2006 to 2022 and includes 1,561 U.S. non-financial firms, comprising 3,499 CEOs and 4,318 CFOs. In addition, a sub-sample covering the post-crisis period from 2011 to 2019 is analysed, consisting of 1,478 U.S. non-financial firms, 2,481 CEOs, and 2,908 CFOs. The dataset is constructed by integrating information from the ExecuComp, Compustat, and Refinitiv databases, ensuring robust coverage for cross-sectional and longitudinal analysis.

I find that delta is insignificant on a standalone basis for both executives, which is consistent with results from Ikram et al. (2017). However, when interacted with optimism and pessimism only CFO delta appears to deliver statistically and economically significant results. Optimist CFOs have a positive effect on CSR performance when their delta value increases, while pessimist CFOs tend to engage less in CSR. McCarthy et al. (2017) show that CEO overconfidence has an adverse effect on CSR performance. These results are also affirmed for CFOs in the first study of this dissertation. However, the findings of this study contradict these results. This may be explained by Chava and Purnanandam's (2010) argument that delta acts as a proxy for risk aversion motivating

CFOs to take less risk, hence get more engaged in CSR activities to benefit from their risk mitigating (Godfrey 2005,2009) effect. Thus, the behavioural influence of delta appears to outweigh that of executive confidence levels.

Unlike delta, CEO vega shows significance both on a standalone basis and in interaction with executive optimism and pessimism. While CEO Vega has a positive effect on CSR scores, as evidenced by Ikram et al. (2017), CFO Vega does not have a significant effect. However, CEO optimism does not appear to moderate the relationship between CEO Vega and CSR. In contrast, when interacted with CEO pessimism, vega exhibits a highly significant and positive effect on CSR scores over the whole sample period. On the other hand, both optimism and pessimism significantly moderate the relationship between CFO vega and CSR. Optimistic CFOs reduce CSR engagement as vega increases, and pessimistic CFOs intensify it. More importantly, the CFO delta and optimism interaction term is economically more significant than the CFO delta coefficient. These directional patterns support the risk-based framework for CSR. (Godfrey 2005,2009) and that overconfident(pessimist) executives engage less (more)in CSR as claimed by McCarthy et al. (2017).

Overall, the findings indicate that CFOs, rather than CEOs, have a more pronounced influence on CSR policy when executive optimism and pessimism are introduced as moderating variables. These results contradict Fabrizi et al. (2014), who claim that CEOs exert more influence.

The interaction terms exhibit lower statistical significance during the sub-sample period than the full sample, although the number of significant variables remains relatively unchanged. The larger coefficients associated with pessimism interactions may reflect the lingering effects of the Great Recession on CFOs' decision-making processes,

while the reduced significance may indicate a diminished role of executive overconfidence and pessimism in shaping CSR policy decisions.

1.2.1 Hypotheses

Executives with higher compensation delta would be expected to engage more in CSR activities if CSR were widely perceived as enhancing firm value. However, the existing literature lacks consensus on whether CSR consistently contributes to firm value creation (Fabrizi et al., 2014). Chava and Purnanandam (2010) use delta as a proxy for risk aversion, suggesting that it may discourage excessive risk-taking, as executives typically hold substantial firm-specific risk that they cannot easily diversify due to limited access to hedging instruments. If higher delta indeed leads executives to avoid further risk exposure, they may be more inclined to pursue CSR initiatives, given that CSR is generally viewed as a risk-reducing strategy (Godfrey, 2005; 2009). From this standpoint, a higher delta could imply greater involvement in CSR. However, Ikram et al. (2017), whose methodologically comparable study spans a longer time frame, find that delta does not significantly impact CSR performance, while vega is more closely associated with CSR engagement. Based on this, I do not expect delta to have a significant effect in my models unless interacted with a moderating variable such as managerial overconfidence or pessimism.

Regarding the effect of delta with the moderator variables, the risk framework approach to CSR suggests that the relationship varies with the level of managerial confidence. Since overconfident (pessimistic) executives are risk-takers (risk-averse), they tend to engage less (more) in CSR, which functions as a risk management strategy for the firm (McCarthy, 2017). However, as noted earlier, if an executive believes that CSR can create firm value, they may be more inclined to engage in CSR initiatives.

Furthermore, if delta serves as a proxy for risk reduction, as Chava and Purnanandam (2010) suggested, a higher delta may also lead to greater CSR involvement. Therefore, I expect the effect of delta on CSR, when interacted with managerial overconfidence and pessimism, to be ambiguous due to these countervailing influences. Hence, I state the following as the first hypothesis.

Hypothesis 1: CEO and CFO compensation delta on a standalone basis do not have a significant effect on CSR policy. When delta interacts with managerial optimism (pessimism), it has an ambiguous effect on CSR policy, varying in direction and significance.

An executive stands to benefit personally from an increase in firm volatility when compensation vega is high. Therefore, one would expect lower engagement in CSR, as CSR policies are typically designed to mitigate firm risk (Godfrey 2005,2009). Given that overconfident executives are more prone to risk-taking behaviour and are generally less inclined to pursue CSR initiatives, unlike their pessimistic counterparts, the adverse effect of vega on CSR is expected to be more pronounced in the presence of overconfident executives. Building on this reasoning, the following hypothesis is proposed to empirically test how these behavioral traits shape the relationship between vega and CSR engagement.

Hypothesis 2: CEO and CFO compensation vega have an adverse effect on CSR policy. This effect is more pronounced and significant when interacting with executive optimism. In contrast, when vega interacts with managerial pessimism, it exhibits a positive relationship with CSR scores.

CEOs (Fabrizi et al., 2014) exert a stronger influence on firm policies, such as CSR, than CFOs, regardless of the executive's confidence level. Moreover, the existing literature on

the effects of risk-taking incentives is predominantly CEO-centred, with studies focusing primarily on CEOs while largely overlooking the role of CFOs. (Mayberry, 2020; Fabrizi et al., 2014; McGuire et al., 2019; and Ikram et al., 2017). Consequently, the third hypothesis argues that CEO risk-taking incentives have a more substantial effect on CSR policy.

Hypothesis 3: Compared to the CFO, CEO compensation delta and vega have a more significant effect on CSR policy when interacted with executive overconfidence and pessimism.

CSR functions as a risk management strategy for firms (Godfrey 2005,2009; Lins et al.,2017), and as such, during times of crisis, executives tend to engage more in CSR to mitigate firm-level risk, irrespective of their individual delta or vega levels. Accordingly, the following hypothesis is claimed to examine whether this risk-buffering role of CSR persists regardless of executives' risk-taking incentives during periods of crisis.

Hypothesis 4: During periods of crisis, the CSR policy adopted by the CEO or CFO is independent of their compensation delta or vega.

2. LITERATURE REVIEW

The majority of research on managerial overconfidence overlooks its counterpart: managerial pessimism. To address this gap, both studies included in this dissertation examine managerial pessimism and its implications for CSR performance. The first study treats it as an independent variable, while the second examines it as a moderator of risk-taking incentives. Research on managerial pessimism is limited, with key contributions by Campbell (2011) and Eichholtz and Yonder (2023). Campbell defines a low-optimism CEO as one who exercises stock options less than 30% in the money and does not hold deep in the money options. Campbell (2011) finds that CEOs with very low or very high optimism face higher forced turnover risk compared to moderately optimistic CEOs. Eichholtz and Yonder (2023) examine how different levels of optimism within executive teams affect asset acquisition overpayments, showing that firms led by teams where both the CEO and CFO are optimistic pay about 3% more for asset acquisitions when the cash ratio rises by one percentage point.

Behavioral finance literature has vastly studied overconfidence; however, the focus has always been on the CEO. Building on this, the current dissertation expands the scope by highlighting the CFO's role in policymaking. While there has been considerable research on CFOs (Ben-David et al., 2007), research on the interaction between executives regarding overconfidence has been scarce. Malmendier et al. (2023) argue that extant CEO-centred research misattributes the CFO overconfidence effect to CEOs, and they show that CFOs have a much stronger effect than CEOs, particularly on a firm's financing decisions. Therefore, CEO-centred studies of overconfidence may mislead us about the effect of executives' characteristics on firm decisions. The impact of CFO risk-taking incentives on CSR performance has been largely overlooked, much like the

influence of CFO overconfidence and pessimism. While prior work by Chava and Purnanandam (2010) explores the effects of CFO delta and vega on firm risk, evidence on how CFO risk-taking incentives shape CSR policy remains scarce. This dissertation, therefore, contributes further to the literature by examining the role of CFO risk incentives in shaping CSR strategies, alongside their CEO counterparts

Prior literature has explored the link between executive flow compensation and corporate social responsibility (CSR). McGuire et al. (2003) find that long-term incentives provided through stock options tend to discourage CSR activities. In contrast, Deckop et al. (2006) report that stock options encourage CSR engagement. Similarly, in a Canadian context, Mahoney and Thorne (2005) identify a negative relationship between long-term compensation and weak CSR performance, thereby contradicting the findings of McGuire et al. (2003). However, studies specifically examining managerial risk-taking incentives (delta and vega) in the context of CSR remain limited and relatively recent (Mayberry, 2020; Fabrizi et al., 2014; McGuire et al., 2019; Ikram et al., 2017). Moreover, the role of managerial overconfidence has not only been overlooked as a moderating factor in this relationship but the broader research on its direct effect on CSR is also scarce (McCarthy et al., 2017). Addressing this gap, the present study integrates managerial overconfidence as a moderator between executive risk-taking incentives and CSR, providing new empirical insights.

The following subheadings present the common theoretical frameworks relevant to both studies, in the following order: CSR and executive characteristics; CSR and executive overconfidence; the relationship between overconfidence and firm risk; and CSR as a hedging mechanism and as a product differentiation strategy. Subsequently, the theoretical frameworks for the relationship between risk-taking incentives and CSR

performance, as well as the link between risk-taking incentives and firm risk, are discussed in connection with the second study.

2.1 CSR and Executive Characteristics

Both upper echelons and stakeholder theories place managerial characteristics at the center of a firm's CSR policy. According to the upper echelons perspective, organizational outcomes are partially predicted by managerial background characteristics. Executives' experiences, values, and personalities affect their field of vision, selective perspective perception, and interpretation (Hambrick, 2007; Hambrick & Mason, 1984). Donaldson (1999) claims that it is crucial to understand the psychology of the ordinary manager as he is the key to the firm's stakeholder management and acts as a glue in combining the instrumental and normative aspects of the theory.

Managerial characteristics such as gender, age, and political affiliations have been studied the most in terms of CSR. Borghesi and Naranjo (2014) find that female CEOs, younger CEOs, and managers who donate to both Republican and Democratic parties are significantly more likely to invest in CSR and suggest that many CSR investments are not aligned with shareholder interests. Instead, they are made for the private benefit of firm managers — either because they believe they have a moral obligation or because they believe these investments enhance their reputation. Cronqvist and Yu (2017) support Borghesi and Naranjo's (2014) findings by revealing that executives with a daughter are employed by firms with ESG/CSR scores about 9.1% higher than the median firm's rating, and the magnitude equals about one-quarter of the effect of the firm's CEO being a woman. Hegde and Mishra (2019) conclude that firms with married CEOs have significantly higher CSR scores, primarily diversity and employee relations sub-scores. DiGiuli and Kostoyevsky (2014) find that firms score higher on CSR when they have

Democratic rather than Republican founders, CEOs, and directors and when they are headquartered in Democratic rather than Republican-leaning states. Petrenko et al. (2016) find a positive relationship between CSR and CEO narcissism. Shabab et al. (2018), based on their research on Chinese firms, argue that CEOs with research backgrounds, financial expertise, and foreign exposure time tend to engage more in activities that improve CSR performance, while young CEOs have the opposite effect.

2.2 CSR and Overconfidence

In a study of 2138 US firms with 3478 different CEOs from 1992-2012, McCarthy et al. (2017) find a negative relationship between CEO overconfidence and CSR employing option-based overconfidence measures. (Banejeer et al., 2015; Malmendier and Tate, 2005; Hirshleifer et al., 2012) Their more detailed analysis shows that this negative relationship is found for institutional aspects of CSR, such as community and workforce diversity, but not for technical CSR, such as corporate governance and product quality. More interestingly, they reveal that the higher level of confidence is generally negatively related to positive aspects (strengths) of CSR but not to the negative aspects (concerns) of CSR. In other words, overconfident CEOs perform less “good CSR” activities but not necessarily more or less “bad CSR” activities.

In the extant literature (Malmendier & Tate, 2008; Tang et al., 2015), hubris is used as a synonym for overconfidence. Tang et al. (2015) argue that hubris and overconfidence are associated with the exact theoretical mechanism. Both hubristic and overconfident individuals have a habit of overestimating their capabilities and considering themselves superior to the average person; they have a strong sense of self-sufficiency and expect positive outcomes to emerge even in uncertain environments. In their study of S&P 1500 index companies from 2001 to 2010, they find strong evidence

that CEO hubris led firms to participate in less socially responsible and more socially irresponsible activities. These effects were weakened when the firm depended more on stakeholders for resources. They utilize firm cash slack, market competition, and firm size as proxies for resource dependence. They follow Malmendier and Tate (2008) and Hirshleifer et al. (2012) to construct a media-based measure of CEO hubris on a final sample of 397 firms, 464 unique CEOs, a measure used to gauge overconfidence.

This study extends research on this topic to the CFO and interactions between the CEO and the CFO. Furthermore, it also entails studying pessimism as a managerial characteristic. Unlike McCarthy et al. (2017) and Tang et al. (2015) this is a comparative study that aims to research the differences in such executive behaviors before and after the Great Recession.

2.3 Overconfidence and Firm Risk

Optimistic managers believe capital markets undervalue their firm's risky securities and overvalue their corporate projects. (Heaton,2002). Thus, underestimating firm risk, overconfident managers would be less prone to hedging. Adam et al. (2015) study the effect of overconfidence on corporate risk management and document a positive relationship between speculation and past speculative gains, without a corresponding relation between speculation and past speculative losses. They claim that this asymmetry supports the conjecture that the financial success of past speculative decisions increases managerial overconfidence. They thus conclude that overconfidence also affects corporate risk management behavior.

In essence, overconfidence measurement based on option exercise is centered on the idea that overconfident CEOs are risk-takers. Executive options are non-tradable, and CEOs cannot legally hedge the risk of their holdings by short-selling company stock.

Furthermore, CEOs are highly exposed to company risk since a large part of their compensation is equity-based, and their human capital is invested in their firms. Thus, one would expect the risk-averse CEO to exercise the option if the prices are sufficiently high. Malmendier and Tate (2005, 2008) classify CEOs who fail to do so as overconfident.

2.4 CSR as a Hedging and Production Differentiation Strategy

Godfrey (2005) asserts that CSR can generate positive moral capital among communities and stakeholders, and such capital can provide shareholders with insurance-like protection for a firm's relationship-based intangible assets. Godfrey et al. (2009) further support this argument by conducting an event study of 178 negative legal/regulatory actions against firms throughout the 11 years from 1993 to 2003. They find that participation in institutional CSR¹ activities aimed at a firm's secondary stakeholders or society provides an "insurance-like" benefit. In contrast, participation in technical CSR, which targets a firm's trading partners, yields no such benefits. Lins et al. (2017) study firms' performance during the 2008-2009 financial crisis and they find that firms with high social capital, as measured by corporate social responsibility (CSR) intensity, had stock returns that were four to seven percentage points higher than firms with low social capital. High-CSR firms also experienced higher profitability, growth, and sales per employee relative to low-CSR firms, and they raised more debt.

¹ This classification is based on KLD CSR ratings. Institutional components include communities, workforce diversity, human resources, environment. Technical components include corporate governance, employment, product quality.

El Ghouli et al. (2011) examine the effect of CSR on the cost of equity capital for a large sample of US firms and find that firms with better CSR scores exhibit cheaper equity financing. They show that “sin” industries, namely tobacco and nuclear power, increase firms’ cost of equity. They attribute risk enhancement to low CSR firms having a reduced investor base and, hence, higher perceived risk.

Kim et al. (2014) find the mitigating effect of CSR on crash risk, defined as the conditional skewness of return distribution, which captures asymmetry in risk and is important for investment decisions and risk management. Crash risk is generally higher for firms that hoard bad news. If socially responsible firms commit to a high standard of transparency and engage in less bad news hoarding, they would have lower crash risk and vice versa. Moreover, they evidence that the mitigating effect of CSR on crash risk is more pronounced when firms have less effective corporate governance or a lower level of institutional ownership. Ilhan et al. (2021) provide evidence of higher downside risk for carbon-intensity firms in the options market, specifically during periods of higher climate change policy uncertainty. They substantiate their argument by evidencing a decrease in such risk in the post-Trump era, owing to less uncertainty, thanks to his clear-cut climate change scepticism

Albuquerque et al. (2019) model CSR as an investment to increase product differentiation, allowing firms to benefit from higher profit margins. They show that CSR decreases systematic risk and thereby increases firm value. These effects are more substantial for firms with high product differentiation (higher advertising spending is used as a proxy). Their results indicate that the economic magnitude of the effect of CSR on firm beta is about 40% stronger for a firm with an average level of advertising spending relative to a firm without advertising spending. CSR’s effect on firm value is about 20%

stronger for a firm with an average level of advertising spending relative to a firm without advertising spending.

Bagnoli and Watts (2003) study the different circumstances in which firms offer socially responsible public goods (e.g., eco-labeling) to their consumers to maximize profits. They find that the conditions of such provisions depend largely on the market competition level and the participation value of the consumers. A key finding of their study is an inverse relationship between the provision of CSR and competition in the market for the private good. Baron and Rubin (2001) coin the phrase “strategic CSR.” They define CSR as the “private provision of a public good. More importantly, Baron and Rubin (2001) assert that companies compete for socially responsible customers by explicitly linking their social contribution to product sales. Ben and Jerry’s commitment to donate 7.5% of its pre-tax profit to social causes was a good example of such strategic CSR. Siegel and Vitaliano (2007) extend this product differentiation theory by studying how CSR varies for firms depending on their product. Their studies reveal that firms offering experience and credence goods (e.g. durable goods and financial services) tend to have a higher CSR rating than search goods. (clothes, furniture, etc.)

2.5 Managerial Risk-Taking Incentives and CSR Performance

Mayberry (2020) studies the effects of risk-taking incentives (vega) on CSR policy from an event-study perspective employing MSCI KLD for CSR scores. He investigates the effect of FAS123R- 3 years before and after- regulatory changes pertaining to executive stock options accounting on CSR policy in an attempt to eliminate the endogeneity concerns. FAS123R’s stipulation to book stock options at fair value drove firms away from such compensation incentives to avert slimming profits. He finds that as executive compensation vega decreases due to firms cutting stock option schemes

following FAS123R, firms tend to reduce their CSR weaknesses, though CSR strength reaction remains muted. He explains the findings with stakeholder theory, which asserts that managers should seek to maximize stakeholder interest as well as those of shareholders through CSR and that CSR serves as insurance for the firm. Due to lower vega, CEOs lack incentives to take risks, hence they seek to avoid CSR weaknesses. He attributes the lack of relationship between CSR strength and vega to how shareholders perceive CSR weakness vs strength differently, as documented in Minor and Morgan (2011). According to the authors, avoiding harm, i.e., reduction of CSR weaknesses, has a more substantial effect on the insurance aspect of CSR, as CSR strengths are much easier to mimic than CSR weaknesses. Therefore, it is easier for shareholders to discriminate between good management and bad in the case of CSR weaknesses. For instance, a firm's charitable contributions are readily quantified. On the other hand, the cost to a firm of not buying from the cheapest supplier because of that supplier's labour practices is the cost difference between using that supplier and the second-best alternative. This cost never appears on a firm's income statement, nor does the CEO appear in the local paper for supplier decisions. Mayberry (2020) also refers to CSR strengths' mere window dressing aspect. (Connors et al., 2017). Furthermore, he finds that the community and employee dimensions of CSR exhibit a stronger relationship with CSR. In cross-sectional analysis, he concludes that CSR weakness and the vega relationship are stronger across litigious industries.

Fabrizi et al. (2014) test the relationship of executive bonus, executive compensation delta, and non-financial reasons with CSR in a study of US companies for 2005-2009 using EIRIS for CSR data. They find that delta affects CSR performance negatively. To eliminate endogeneity issues, they employ three-stage least squares with

simultaneous equations (3SLS) and two-stage least squares with instrumental variables (2SLS). They claim that firms might jointly decide CSR strategy and the CEO's compensation structure. Therefore, some unobservable variables might affect the compensation structure and CSR, such as the CEO's characteristics. Moreover, CSR-related indicators might be included as performance targets in managers' incentive schemes.

McGuire et al. (2019) study 84 non-financial firms that were part of the S&P 100 in 2006 for the period 2006-2011 (467 observations (OBS) using MSCI KLD as CSR database. Different from the other studies they use manually collected company proxy filing data rather than ExecuComp for their research. Their methodology is restricted in terms of endogeneity as they believe compensation does not have much effect on CSR. They test how compensation duration and pay performance sensitivity affect CSR. In their research, they employ delta as a measure for pay performance sensitivity. They find that the performance sensitivity of CEO pay, namely delta, is negatively associated with poor social performance but also negatively affects strong social performance. This is a conflicting result which sets it apart from the preceding research, that is, if delta is negatively associated with CSR, then one would expect a positive relationship between poor social performance and delta. The authors frame the results under the behavioural agency model (Wiseman and Gomez-Mejia, 1998), which, as opposed to the traditional agency model, suggests that in the face of higher risk posed by executive options, CEOs endeavour to preserve their wealth by shying away from risky firm choices and that they are loss-averse. Therefore, when delta is higher, CEOs are less prone to take risks, hence opt out of poorer CSR choices. Furthermore, in line with prospect theory (Tversky and Kahneman, 1991; Kahneman and Tversky, 1979), they outweigh the potential adverse

effects of poor CSR performance and underweight the effects of strong CSR performance since they prioritize preserving wealth rather than maximizing wealth. At best, under such assumptions, one would expect the neutral relationship between CSR strength and delta. However, they find a negative relationship and ascribe that to the uncertain benefits one is to gain from positive CSR performance. They also emphasize that the weak CSR performance is more salient relative to positive performance, as such, the market reacts more strongly to news of weak CSR performance.

Ikram et al. (2017) analyse a panel dataset of U.S. firms from 1995 to 2013, utilizing delta and vega measures from Core and Guay (2002) and Coles et al. (2006) databases. Their study examines the effects of executive compensation incentives, specifically delta and vega, on CSR ratings. The authors find that delta does not significantly impact CSR, whereas vega exhibits a strong and positive causal relationship with CSR engagement. These findings challenge the traditional risk-management perspective of CSR, which posits that CSR reduces firm risk. Instead, Ikram et al. argue that CSR may increase firm risk. They liken CSR initiatives to other risk-enhancing corporate activities such as R&D investment, higher financial leverage, and product line concentration, emphasizing that CSR projects often involve innovation and uncertainty, which can introduce stock performance and shareholder value volatility. The lack of a significant relationship between delta and CSR suggests that a CEO's CSR decisions largely depend on their sensitivity to changes in the underlying stock price, as captured by delta.

2.6 Managerial Risk-Taking Incentives and Firm Risk

Analysing a sample of 278 corporate CEOs, Guay (1999) finds that stock options significantly enhance the convexity (vega) of the relationship between managerial wealth and firm stock price. His cross-sectional analyses reveal that, even after controlling for the slope of the wealth–performance relationship (delta), convexity is positively associated with proxies for growth options in firms’ asset structures. This supports the hypothesis that firms design compensation structures to incentivize managers to pursue riskier investments, particularly when the cost of foregoing high-potential, risk-enhancing projects is high. Furthermore, he finds a positive relationship between firm equity risk and the convexity embedded in CEO compensation.

Coles et al. (2006) have similar results to Guay (1999), but they encompass additional effects of vega on debt policy. In their study of the firms in ExecuComp database for the period 1992-2002 and controlling for CEO pay-performance sensitivity (delta) and reverse-causality, they find that higher sensitivity of CEO wealth to stock volatility (vega) engenders riskier policy choices, including relatively more investment in R&D, less investment in PPE (property, plant and equipment), more focus on fewer lines of business, and higher leverage. Controlling for reverse causality, they also find that riskier policy choices generally lead to higher vega and lower delta compensation structures.

Chava and Purnanandam (2010) examine all firms included in the Compustat Executive Compensation database from 1993 to 2005. Leveraging the 2004 stock option expensing regulation as an exogenous shock, they establish a causal link between managerial incentives and corporate financial policies. Their findings indicate that the risk-taking incentives of both CEOs and CFOs significantly shape their firms’ economic

decisions. Specifically, CEOs with risk-decreasing (increasing) incentives tend to pursue lower (higher) leverage and maintain higher (lower) cash balances. For CFOs, risk-decreasing (increasing) incentives are associated with safer (riskier) debt maturity structures and greater (less) earnings smoothing through accounting accruals. The authors use vega as a proxy for risk-taking incentives, arguing that higher Vega encourages executives to undertake riskier policies in pursuit of personal wealth gains. Conversely, they interpret low vega as a proxy for risk-averse behaviour. In contrast, delta represents the sensitivity of an executive's wealth to changes in firm value, which can discourage excessive risk-taking. This is because managers typically hold a disproportionately large share of their wealth in firm-specific stock and cannot hedge this exposure, while their human capital is also tightly linked to the firm's performance.

Armstrong and Vashishtha (2012) argue that an increase in vega motivates risk-averse CEOs to raise systematic risk, as it can be hedged through the market portfolio. However, it does not lead to an increase in idiosyncratic risk. This suggests that stock options may not necessarily incentivize managers to pursue projects primarily characterized by idiosyncratic risk when alternatives involving systematic risk are available. Delta also influences managerial incentives to adjust both systematic and idiosyncratic risk, but unlike vega, the direction of its effect is inherently ambiguous. On one hand, higher delta increases a manager's exposure to firm-specific risk, incentivizing them to reduce both systematic and idiosyncratic risk. On the other hand, it may encourage risk-taking if such actions are expected to significantly enhance firm value or facilitate a transfer of wealth from creditors to shareholders.

Mao and Zhang (2018) analyse the causal effect of managerial risk incentive (vega) on innovation- risky long-term investments- through changes instigated by the

FAS 123R accounting regulation in 2005 that mandated stock option expensing at fair values. FAS 123R eliminated firms' ability to expense options at intrinsic value. It required them to expense all stock-based compensation at their fair values, removing the accounting advantages associated with option grants relative to restricted stock grants. Accordingly, firms responded to it by significantly cutting the stock options they grant to employees, providing an ideal setting to study the effects of vega. Their results reveal a positive and causal impact of CEOs' vega on innovation activities. Furthermore, after implementing FAS 123R, they observe a significant reduction in innovation related to firms' core business and explorative inventions, substantiating their argument.

Boyallian and Ruiz-Verdú (2018) study the effect of risk-taking incentives of bank CEOs on bank failure during the 2007-2010 financial crisis among US financial firms. Contrary to prevailing literature, they find that vega does not induce CEOs to take on firm risk for levered firms; hence, it is not the culprit for bank failure, but delta is. In a highly levered firm, the CEO is incentivized to increase risk when delta rises to transfer firm value from debt holders to equity holders. They argue that for a risk-averse CEO, an increase in vega does not necessarily translate into higher utility for the CEO, since s/he cannot freely trade or hedge the option. Hence, higher volatility increases the risk of the CEO's options and stock portfolio.

2.7 Summary

This dissertation builds on several theoretical foundations, including upper echelons and stakeholder theories, which emphasize the central role of managerial characteristics in shaping CSR policy; resource dependence theory, which suggests that managers rely more heavily on stakeholders when firm resources are constrained; hedging theory, which frames CSR as a tool for risk mitigation through enhanced social

capital; and product differentiation theory, which views CSR as part of a profit-maximizing strategy.

Existing studies, such as McCarthy et al. (2017) and Tang et al. (2015), investigate the effect of CEO overconfidence on CSR but neglect the influence of CFOs and team dynamics. Moreover, these studies do not include an analysis of periods characterized by heightened uncertainty. This dissertation addresses these gaps by incorporating CFO behavior and executive team composition into the analysis and by separately examining the post-crisis period to account for resource dependence.

In relation to risk-taking incentives, this study aligns closely with Ikram et al. (2017), who examine the link between delta, vega, and CSR over an extended period using year fixed effects and the same database (Naveen L.). However, their work focuses solely on CEOs and finds a positive relationship between vega and CSR, contradicting the dominant view that CSR serves as a risk management tool. While this study's findings for standalone delta and vega corroborate Ikram et al. (2017), the interaction models here provide stronger support for CSR's risk-buffering role. Furthermore, this study seeks to address the limitations of Fabrizi et al. (2014), McGuire et al. (2019), and Mayberry (2020), which are constrained by narrow time frames, by extending the analysis over a longer period. The research summarized here examines risk-taking incentives without considering any moderating variables, using executive characteristics solely as control variables. This dissertation contributes to the literature by analyzing the effects of delta and vega in interaction with managerial overconfidence.

3. METHODOLOGY

This chapter provides the methodological framework for the dissertation's two studies. Sections 3.1 and 3.2 present the data, variables, summary statistics and models used to analyze, respectively, CSR performance in relation to managerial overconfidence (pessimism) and to risk-taking incentives interacting with these traits. The data used in both studies are drawn from multiple established databases. Executive options and characteristics are obtained from ExecuComp, financial information comes from Compustat and CRSP, and corporate social responsibility (CSR) scores are sourced from the Refinitiv database. Measures of managerial risk-taking incentives are retrieved from Naveen L.'s dataset (n.d), constructed following the methodologies of Coles et al. (2006, 2013) and Core and Guay (2002). Consistent with Chourou et al. (2022), Malmendier et al. (2023), Bouslah et al. (2018), and McGuire (2019), financial firms are excluded from the sample by omitting firms with Standard Industrial Classification (SIC) codes between 6000 and 7000.

3.1 CSR and Managerial Overconfidence (Pessimism)

This section presents the sample details, key independent and control variables, and summary statistics for the first study.

3.1.1 Data and Variables

The sample periods include 2006 to 2022 and 2011 to 2019. Rather than selecting just the pre-crisis years for comparison, the 2006-2022 period was selected to observe the executive behavior for a more extended period following Mcarthy et al. (2017). In the post-GFC sample of 2011 to 2019, post-COVID years are omitted due to the potential COVID-19 effect. After matching ExecuComp and Refinitiv databases my sample for

2006 to 2022 includes 23142 firm-years, 1685 firms, 3795 CEOs and 4340 CFOs and for 2011 to 2019 12660 firm-years, 1596 firms, 2725 CEOs and 3022 CFOs.

Table 3.1 lists the model variables and their descriptions.

Table 3.1 *Model Variables (i: firm t: year)*

Dependent variables	Measurement
ESG _{i,t} (Decimals)	ESG score from Refinitiv for any given year and firm.
E _{i,t} (Decimals)	E (environment) pillar score from Refinitiv for any given year and firm
S _{i,t} (Decimals)	S (social) pillar score from Refinitiv for any given year and firm
Independent variables	
Opt_YONDER_CFO _{i,t}	A dichotomous variable for CFO optimism level as per Eichholtz and Yonder (2023) for any given year and firm
Opt_CAMPB_CFO _{i,t}	A dichotomous variable for CFO optimism level as per Campbell et al. (2011) for any given year and firm
Pess_YONDER_CFO _{i,t}	A dichotomous variable for CFO pessimism level as per Eichholtz and Yonder (2023) for any given year and firm
Pess_CAMPB_CFO _{i,t}	A dichotomous variable for CFO pessimism level as per Campbell et al. (2011) for any given year and firm
Opt_YONDER_CEO _{i,t}	A dichotomous variable for CEO optimism level as per Eichholtz and Yonder (2023) for any given year and firm
Opt_CAMPB_CEO _{i,t}	A dichotomous variable for CEO optimism level, as per Campbell et al. (2011), for any given year and firm
Pess_YONDER_CEO _{i,t}	A dichotomous variable for CEO pessimism level as per Eichholtz and Yonder (2023) for any given year and firm
Pess_CAMPB_CEO _{i,t}	A dichotomous variable for CEO pessimism level, as per Campbell et al. (2011), for any given year and firm
Optimist_Team_YONDER _{i,t}	A dichotomous variable for TEAM optimism level as per Eichholtz and Yonder (2023) for any given year and firm
Balanced_Team_YONDER _{i,t}	A dichotomous variable for TEAM balance level as per Eichholtz and Yonder (2023) for any given year and firm
Optimist_Team_CAMPB _{i,t}	A dichotomous variable for TEAM optimism level as per Campbell et al. (2011) for any given year and firm
Balanced_Team_CAMPB _{i,t}	A dichotomous variable for TEAM balance level as per Campbell et al. (2011) for any given year and firm

OptimistNeutr_Team _{i,t}	A dichotomous variable for the team when CEO is overconfident, and the CFO is neutral or the CEO is neutral CFO is overconfident for any given firm and year.
PessimistNeutr_Team _{i,t}	A dichotomous variable for team when CEO is pessimistic, CFO is neutral, CEO is neutral, and CFO is pessimistic for any given firm and year.
Control Variables	
Firm-Specific Variables	
Log_Assets _{i,t} (\$Million)	Natural log of the book value of total assets for any given year and firm Compustat: log (at)
ROA _{i,t} (Decimals)	Net income/Total Assets for any given year and firm. Compustat: ni/at
debt_over_equity_w _{i,t} (Decimals)	[(Long-term debt+debt in current liabilities) / (common shares outstanding x Stock price closing for fiscal year end)] for any given year and firm. Compustat: (dltt+dlc)/ (csho x prcc_f). Dltt, dlc in \$Million
risk_adj_ret _{i,t} (Decimals)	(Annual Log Stock return - Average of monthly 3-month bill rates/100)/ (Standard deviation of weekly returns for the year x $\sqrt{52}$) ² for any given year and firm
CEO/CFO Specific Variables	
ageCEO _{i,t}	The age of a CEO for any given year and firm
shrown_tot_pctCEO _{i,t} (Percentage)	Percentage of total shares outstanding held by the executive for any given year and firm. ExecuComp: shrown_tot_pct
log_tdc1CEO _{i,t} (in \$thousands)	Natural log of compensation+1 for any given year and firm ExecuComp: TDC1 ³
tenureCEO _{i,t}	CEO tenure for any given year and firm ExecuComp: (leftco- joined_co) /365 or the number of years the executive appears in the database ⁴
gender_dummyCEO _{i,t}	A dummy variable equal to 1 if the CEO is female
ageCFO _{i,t}	The age of a CFO for any given year and firm
shrown_tot_pcCFO _{i,t} (Percentage)	Percentage of total shares outstanding held by the executive for any given year and firm. ExecuComp: shrown_tot_pct
log_tdc1CFO _{i,t} (in \$thousands)	Natural log of compensation +1 for any given year and firm

² The risk-free rates (3-month T-bills) are obtained from CRSP risk free rate series monthly data. For the weekly and annual stock returns daily simple returns (RET) data from CRSP is used.

³ According to 2006 reporting format comprises Salary, Bonus, Non-Equity Incentive Plan Compensation, Grant-Date Fair Value of Option Awards, Grant-Date, Fair Value of Stock Awards, Deferred Compensation Earnings Reported as Compensation, and Other Compensation.

⁴ If either of “leftco” or “joined_co” are blank in Execucomp, the number of years the executive is in the database is used. “joined_co” is considered as 1.1.2006.

	ExecuComp: TDC1
tenureCFO _{i,t}	CFO tenure for any given year and firm
	ExecuComp: (leftco- joined_co) /365 or the number of years the executive appears in the database
gender_dummyCFO _{i,t}	A dummy variable equal to 1 if the CFO is female for any given year and firm
<i>Moderating Variable</i>	
Cash_Stock_Perc _{i,t} (Percentage)	Cash/Total Assets for any given year and firm. ExecuComp: ch/ta

The ESG, E, and S scores from Refinitiv are in decimals. The lowest score is 0, and the highest is 100. The key independent variables are individual optimism and pessimism, optimistic team, and balanced team measures. The names of the variables correspond to the methodology used. (Eichholtz and Yonder, 2023; Campbell et al., 2011) Executives are assigned a value of 1 if they are optimistic or pessimistic and 0 if neither. Similarly, teams are assigned a value of 1 if they are classified as optimistic or balanced and 0 if neither. OptimistNeutr_Team and PessimistNeutr_Team are dichotomous variables that pertain to the alternative team model. OptimistNeutr_Team is assigned a value of 1 when the CEO (CFO) is overconfident, and the CFO(CEO) is neutral. PessimistNeutr_Team is assigned a value of 1 when the CEO(CFO) is pessimistic and the CFO(CEO) is neutral. Log assets is the natural logarithm of the firm book value of total assets in \$million. ROA is net income/total assets, both in \$million. Debt/equity is long-term debt plus debt in current liabilities over common shares outstanding multiplied by stock price closing for fiscal year-end. The debt figures are both in \$million. Risk-adjusted return is the natural logarithm of annual stock return minus the annual average of monthly 3-month bill rates in decimals over the annualized standard deviation (STD. DEV) of weekly returns for the year. Executive age is obtained from ExecuComp. Percentage of total shares outstanding held by CEOs and CFOs are obtained from ExecuComp and are in percentage. Log TDC1 Is the natural logarithm of executive

compensation + 1. The compensation amount corresponds to TDC1 (in \$thousands) in ExecuComp. The executive tenure is the number of times the executive appears as CEO or CFO in the database if both left_co and joined_co data are unavailable in ExecuComp. If the ExecuComp data are available, it is calculated by left_co- minus joined_co over 365, where the joining date cannot be smaller than the start date of the sample. The executive gender variable is a dummy corresponding to 1 for females and 0 for males. Cash stock percentage is used as a moderating variable in the robustness models and is the firm cash over total assets (both in \$million). All financial data are obtained from Compustat, and executive data is obtained from ExecuComp. All firm-specific variables are in decimals.

The overconfidence and pessimism measurement methodologies follow Campbell et al. (2011) and Eichholtz and Yonder (2023), which are based on executives' option-exercising behavior. Campbell et al. (2011) classify overconfidence into three groups: high, moderate, and low optimism. They identify CEOs as high optimists if they hold stock options that are more than 100% in the money. On the other hand, they define a low-optimism CEO as one who exercises stock options less than 30% in the money and does not hold other exercisable (EXER) options greater than 30% in the money. They assign moderate optimism if the CEO holds and/or exercises options with moneyness between 30% and 100%. Eichholtz and Yonder (2023) classify an executive as over-optimistic if he holds an exercisable (EXER) stock option that is at least 67% in the money. Their definition of pessimism is based on Campbell et al.'s (2011), however less strict. They require a single condition that the executive exercises a stock option when the option is below 30% in the money. In this study, both pessimism measurements are employed. Following these studies, the executive is classified as pessimistic or

overconfident provided he exhibits the same behavior at least twice during his tenure. Option moneyness is estimated since ExecuComp does not provide such details for option holdings.

Following Campbell et al. (2011), average moneyness for options held are measured as presented in Equations 3.1-3.3:⁵

$$\text{Realizable value per option (\$)} = \frac{\text{Est.value of ITM Unex.Exer. Options}}{\text{Unex.Exer.Options}} \quad (3.1)$$

$$\text{Est.exercise price} = \text{Yearend closing price} - \text{Realizable value per option} \quad (3.2)$$

$$\text{Average moneyness} = \frac{\text{Realizable value per option}}{\text{Estimated exercise price}} \quad (3.3)$$

Average moneyness for options exercised are measured as presented in Equations 3.4-3.6:

Per option value realized from exercising the option (\$) :

$$\frac{\text{Value realized on option exercise}}{\text{Number of shares acquired on option exercise}} \quad (3.4)$$

Estimated exercise price:

$$[\text{Yearend closing price} - \text{per option value realized from exercising the option}] \quad (3.5)$$

$$\text{Average moneyness} = \frac{\text{Per option value realized from exercising the option}}{\text{Estimated exercise price}} \quad (3.6)$$

⁵ The variables are obtained from ANNCOMP table under EXECUCOMP apart from the year-end closing price for the stock, which is obtained from CODIRFIN table. The term “exercisable” here implies “vested” options.

However, neither Eichholtz and Yonder (2023) nor Campbell et al. (2011) provide details on how the classification shall be executed if the executive can be identified as pessimistic and overconfident during his tenure. Therefore, to deal with this problem, I develop two different approaches; optimism prevails assumption (OPA) and count comparison assumption (CCA). According to Tang et al. (2015), overconfident (hubristic) people consider themselves superior to the average person. Therefore, one could assume that overconfidence dominates pessimism as a personal trait. Following this rationale, “optimism prevails assumption” (OPA) treats the executive as overconfident as long as he has displayed such behavior at least twice during his tenure despite similarly displaying pessimistic behavior. My sample also includes cases where executives worked at multiple firms. In such cases, the executive is classified as overconfident if he is classified as such in at least one of the firms. On the other hand, the counts comparison assumption compares the number of counts (years) in which the executive has exhibited overconfident versus pessimistic behavior during his tenure. Under this assumption, neither of the behavioral biases are considered dominant. Instead, he is classified depending on the number of counts. For instance, if he exhibits overconfident behavior for four years during his tenure, whereas two years for pessimistic behavior, he is considered overconfident. If the executive worked at multiple firms, overconfidence or pessimism is assigned according to his classification at the firm with longer employment. If he worked for the same period at multiple firms, he is classified as neutral, implying that he cannot be classified as either.

Executives are assigned “0” or “1” categorical values under the relevant overconfidence or pessimism measures. Team measurement is defined following Eichholtz and Yonder (2023), where teams are classified as balanced or optimistic. For

example, if the CEO and the CFO are overconfident, the team is classified as optimistic. If one of the executives is overconfident and the other is pessimistic, then the team is classified as balanced. Correspondingly, teams are assigned “0” or “1” categorical values under the relevant “optimistic” or “balanced” team measures.

Table 3.2 presents the key statistics for ESG, environmental (E) and social (S) scores, firm-level and executive characteristics.

Table 3.2 *Variables Descriptives*

2006-2022 (23142 firm-years) and 2011-2019 (12660 firm-years)

	2006-2022					2011-2019				
Variable	Obs	Mean	Std. dev.	Min	Max	Obs	Mean	Std. dev.	Min	Max
DEPENDENT VARIABLES										
ESG	15,459	44.465	19.430	0.600	95.160	9,022	43.374	19.147	0.630	93.210
E	15,371	32.718	28.004	0.000	98.550	8,999	31.226	27.850	0.000	98.550
S	15,371	46.045	21.598	0.260	98.120	8,999	44.816	21.352	0.260	98.120
CONTROL VARIABLES: FIRM CHARACTERISTICS										
Log_Assets	22,852	7.872	1.694	-0.742	13.590	12,563	7.864	1.693	-0.742	13.483
ROA	22,848	0.038	0.155	-4.516	1.843	12,560	0.039	0.144	-3.520	1.843
debt_over_equity_w	22,166	0.462	0.888	0.000	7.391	12,144	0.432	0.791	0.000	6.441
risk_adj_ret	21,978	0.292	0.993	-3.450	4.163	12,063	0.393	1.014	-3.253	4.163
CONTROL VARIABLES: EXECUTIVE CHARACTERISTICS										
ageCEO	22,774	56.475	7.232	27.000	96.000	12,502	56.669	7.167	27.000	96.000

shrown_tot_pctCEO	19,691	2.629	6.308	0.000	87.600	11,716	2.397	6.049	0.000	68.637
log_tdc1CEO	22,794	8.359	1.172	0.000	12.599	12,498	8.383	1.142	0.000	12.545
tenureCEO	22,837	9.026	4.373	0.027	17.000	12,570	6.198	2.425	1.000	9.000
gender_dummyCEO	22,837	0.045	0.207	0.000	1.000	12,505	0.048	0.215	0.000	1.000
ageCFO	21,760	51.642	6.587	30.000	78.000	12,328	51.982	6.446	30.000	77.000
shrown_tot_pctCFO	17,638	0.225	0.478	0.000	18.800	11,157	0.208	0.377	0.000	7.534
log_tdc1CFO	22,368	7.432	0.904	0.000	11.593	12,349	7.459	0.871	0.000	11.593
tenureCFO	22,405	7.618	4.235	0.332	17.000	12,429	5.450	2.481	1.000	9.000
gender_dummyCFO	22,405	0.113	0.316	0.000	1.000	12,355	0.114	0.318	0.000	1.000

Some firms have scored as low as 0 in environmental or social performance, possibly due to missing ESG disclosures, according to Refinitiv Helpdesk. The average firm asset size is \$11billion. The average ROA is 3.8%, and debt/equity is 46.2%. Risk-adjusted return is, on average, higher for the 2011-2019 period at 39.3% relative to 29.2% for 2006 to 2022. CEO age ranges between 27 and 96, and CFO age between 30 and 78. CEOs own as large as 87.6% (on average 2.62%) of the firm, while CFOs own only 18.8% (on average 0.22%). The samples comprise predominantly male executives. CEOs receive an average compensation of \$7million and CFOs \$2.5million.

Tables 3.3 and 3.4 provide the summary statistics for individual and team-level optimism and pessimism measures.

Table 3.3 *Executive Overconfidence and Pessimism Descriptives**2006-2022 (23142 firm-years, 1685 firms) and 2011-2019 (12660 firm-years, 1596 firms)*

	2006-2022			2011-2019		
CEOs						
Variable	<i>Obs</i>	<i>Mean</i>	<i>Std. dev.</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. dev.</i>
Opt_YONDER_OPA	3,795	0.353	0.478	2,725	0.306	0.461
Pess_YONDER_OPA	3,795	0.038	0.190	2,725	0.032	0.175
Opt_CAMPB_OPA	3,795	0.353	0.478	2,725	0.306	0.461
Pess_CAMPB_OPA	3,795	0.020	0.140	2,725	0.013	0.114
Opt_CCA_YONDER	3,795	0.333	0.471	2,725	0.292	0.455
Pess_CCA_YONDER	3,795	0.043	0.202	2,725	0.034	0.182
Opt_CCA_CAMPB	3,795	0.343	0.475	2,725	0.299	0.458
Pess_CCA_CAMPB	3,795	0.022	0.145	2,725	0.014	0.116
CFOs						
Variable	<i>Obs</i>	<i>Mean</i>	<i>Std. dev.</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. dev.</i>
Opt_YONDER_OPA	4,340	0.261	0.439	3,022	0.230	0.421
Pess_YONDER_OPA	4,340	0.024	0.152	3,022	0.017	0.129
Opt_CAMPB_OPA	4,340	0.261	0.439	3,022	0.230	0.421
Pess_CAMPB_OPA	4,340	0.013	0.115	3,022	0.006	0.079
Opt_CCA_YONDER	4,340	0.247	0.431	3,022	0.222	0.416
Pess_CCA_YONDER	4,340	0.025	0.157	3,022	0.017	0.130
Opt_CCA_CAMPB	4,340	0.253	0.435	3,022	0.226	0.418
Pess_CCA_CAMPB	4,340	0.014	0.118	3,022	0.006	0.079

Note: The variable names are slightly altered here to make the table more legible. OPA and CCA abbreviations refer to “Optimism Prevails Assumption”(OPA) and “Count Comparison Assumption (CCA). The overconfidence and pessimism measures are calculated according to Campbell et al. (2011) and Eichholtz and Yonder (2023) under two different assumptions.

Table 3.4 *Team Balance and Optimism Descriptives**2006-2022 (23142 firm-years), 2011-2019 (12660 firm years)*

	2006-2022			2011-2019		
Variable	Obs	Mean	Std. dev.	Obs	Mean	Std. dev.
Optimist_Team_YONDER_OPA	6,415	0.182	0.386	4,108	0.152	0.359
Balanced_Team_YONDER_OPA	6,415	0.014	0.120	4,108	0.009	0.093

Optimist_Team_CAMPB_OPA	6,415	0.182	0.386	4,108	0.152	0.359
Balanced_Team_CAMPB_OPA	6,415	0.007	0.085	4,108	0.002	0.049
Optimist_Team_YONDER_CCA	6,415	0.166	0.372	4,108	0.143	0.350
Balanced_Team_YONDER_CCA	6,415	0.014	0.117	4,108	0.009	0.097
Optimist_Team_CAMPB_CCA	6,415	0.172	0.378	4,108	0.148	0.355
Balanced_Team_CAMPB_CCA	6,415	0.007	0.084	4,108	0.002	0.049

Note: The variable names are slightly altered here to make the table more legible. OPA an CCA abbreviations refer to “Optimism Prevails Assumption” (OPA) and “Count Comparison Assumption (CCA). The overconfidence and pessimism measures are calculated both according to Campbell et al. (2011) and Eichholtz and Yonder (2023) methodologies under the two different assumptions.

The optimistic CEO percentages are close to the 34.1% of highly optimistic CEOs reported by Campbell et al. (2012) for 1992-2005 and the optimistic CEO percentage of 40% reported by Malmendier and Tate (2015) for 2006-2012. The pessimistic CEO percentage deviates slightly from the results of Campbell et al. (2012), which report 8.9% of CEOs with low optimism. Table 3 shows that optimistic and pessimistic executive percentages are lower for the post-GFC period. As measured by Campbell et al. (2012) methodology, the individual pessimism percentages are lower than those of Eichholtz and Yonder (2023) since the former is a stricter measure. The count comparison assumption (CCA) provides a higher percentage of optimists relative to the optimism prevails assumption (OPA) since the latter stipulates that optimism dominates pessimism. Following the pattern in table 3, table 4 demonstrates a decrease in optimistic and balanced teams during the post-GFC period relative to 2006-2022. Optimistic teams comprise 15-18% of the sample, while the number of balanced teams is strikingly low. The optimistic and balanced team percentages deviate significantly from those of Eichholtz and Yonder (2023). However, they only study US REITS, which acquired assets from 2011-2017. According to Campbell et al. (2012) measure paired with count comparison assumption (CCA), the number of balanced teams for 2006-2023 is 45 relatives to just 8 for the post-GFC period.

The choice of control variables is guided by both the availability of data and the extant literature. *Gender* is usually known to have a significant effect on CSR; firms with women as corporate leaders or board members report higher CSR scores (Borghesi et al., 2014). CEOs with daughters tend to achieve higher CSR ratings (Cronqvist & Yu, 2017), and firms with married CEOs have significantly higher CSR scores. (Hegde and Mishra, 2019). *Firm size* is usually expected to have a positive effect on CSR. (Drempetic et al., 2020; Mc Carthy et al., 2017). The relationship between *ROA*, *long and short-run stock returns*, *financial leverage*, and CSR is ambiguous. Di Giuli and Kostovetsky (2014) study the relationship between changes in firms' CSR scores across three years and their revenue growth over that period and find no significant relationship. However, they find a significant negative relationship between changes in firms' CSR scores and changes in ROA or stock returns for the same period. Lins et al. (2017) study firms' performance during the 2008- 2009 financial crisis. They find that high-CSR firms experience higher profitability, growth, and stock returns and that they raise more debt thanks to their social capital. Hong and Kacperczyk (2009) find that "sin stocks"- low-ESG/CSR stocks in alcohol, tobacco, or gaming industries-have higher expected returns than otherwise comparable stocks, consistent with them being neglected by norm-constrained investors and facing greater litigation risk heightened by social norm. Edmans (2011) finds a positive relationship between CSR performance proxied by employee satisfaction and stock returns. He explains this through mispriced intangibles, which are later correctly priced. Bolton and Kacperczyk (2020) find that firms with low CO2 emission intensity have low stock returns. Barnea and Rubin (2010) find that, on average, insiders' ownership and leverage are negatively related to the firm's social rating, while institutional ownership is uncorrelated.

The extant literature also offers mixed results on the impact of *CEO characteristics* on CSR. Fabrizi et al. (2014) use age as a proxy for career concern and conclude that the lower the career concerns -higher age-the better is the CSR performance. On the other hand, Borghesi et al. (2014) conclude that younger CEOs are significantly more likely to lead firms with higher ESG/CSR. Chen et al. (2019) claim that firms' CSR performance is significantly higher in the CEO's early tenure than in their later tenure. Jeong et al. (2021) show that CSR activity varies with CEO tenure in an inverted U-shaped relationship, but the association between tenure and CSR changes dramatically with CEO political orientation. Liberal CEOs maintain a higher level of CSR performance in their late tenure than conservative CEOs. On the other hand, the literature provides largely consistent results regarding the relationship between CEO pay and CSR. Gillan et al. (2010) find that CEOs at firms with higher ESG/CSR performance have lower salaries, suggesting that, even if ESG/CSR expenditures indicate CEO rent-seeking, they are substitutes for, rather than complements to, CEO pay. Similarly, Jian and Lee (2015) find a negative association between ESG/CSR and CEO pay. Ferrell et al. (2016) also find that a measure of excess CEO pay is negatively correlated with ESG/CSR scores and conclude that CEOs with high pay that is unrelated to performance invest less in ESG/CSR activities. CEO ownership is primarily studied in relation to CEO power, and studies broadly show that better governance improves CSR ratings (Jo & Harjoto, 2011).

3.1.2 Models

For all models:

α_i : Firm fixed- effects.

γ_t : Year fixed- effects.

3.1.2.1 Individual Overconfidence and Pessimism Model

This model (Equation 3.6) follows studies of McCarthy et al. (2017) and Tang et al. (2015) on the effect of managerial overconfidence on CSR performance.

$$\begin{aligned} ESG(E, S) Score_{i,t} = & \alpha_0 + \beta_1 CEO Optimism_{i,t-1} + \beta_2 CEO Pessimism_{i,t-1} + \\ & \beta_3 CFO Optimism_{i,t-1} + \beta_4 CFO Pessimism_{i,t-1} + \\ & \phi CEO CFO specific controls_{i,t-1} + \delta Firm specific controls_{i,t-1} + \alpha_i + \gamma_t + \\ & \epsilon_{i,t} \end{aligned} \quad (3.6)$$

3.1.2.2 Team Optimism and Balance Model

This model (Equation 3.7) follows Eichholtz and Yonder (2023), where balanced and optimistic teams are key independent measures.

$$\begin{aligned} ESG(E, S) Score_{i,t} = & \alpha_0 + \beta_1 Balanced Team_{i,t-1} + \beta_2 Optimistic Team_{i,t-1} + \\ & \phi CEO CFO specific controls_{i,t-1} + \delta Firm specific controls_{i,t-1} + \alpha_i + \gamma_t + \\ & \epsilon_{i,t} \end{aligned} \quad (3.7)$$

3.1.2.3 CEO CFO Optimism Two-way interaction

This model (Equation 3.8) only entails the possibility of both executives acting in the same optimistic or pessimistic manner. This model is created as an alternative to the team model to see the incremental effect of CEO and CFO interaction.

$$\begin{aligned} ESG(E, S) Score_{i,t} = & \alpha_0 + \beta_1 CEO Optimism_{i,t-1} + \\ & \beta_2 (CEO Optimism_{i,t-1} \times CFO Optimism_{i,t-1}) + \beta_3 CFO Optimism_{i,t-1} + \\ & \beta_4 (CEO Pessimism_{i,t-1} \times CFO Pessimism_{i,t-1}) + \beta_5 CEO Pessimism_{i,t-1} + \end{aligned}$$

$$\beta_6 CFO Pessimism_{i,t-1} + \varphi CEO CFO specific controls_{i,t-1} + \delta Firm specific controls_{i,t-1} + \alpha_i + \gamma_t + \varepsilon_{i,t} \quad (3.8)$$

3.1.2.4 Cash Interaction Models

The cash interaction models are introduced (Equation 3.9 and 3.10) to investigate if a larger free cash flow could dominate or overcome the effects of managerial overconfidence or pessimism bias on CSR performance since firms with higher CSR ratings tend to have larger free cash flow. (Borghesi et al., 2014). This cash interaction model follows Eichholtz and Yonder (2023), who analyze the additional effect of a firm's cash holdings on the pricing of the acquisition transactions. They interact the balanced team coefficient with cash stock to investigate the additional effect of cash stock as a moderator for balanced team.

CEO, CFO optimism, pessimism, and cash stock interaction model:

$$\begin{aligned} ESG(E,S) Score_{i,t} = & \alpha_0 + \beta_1 CEO Optimism_{i,t-1} + \beta_2 Cash stock_{i,t-1} + \\ & \beta_3 CFO Optimism_{i,t-1} + \beta_4 (CEO Optimism_{i,t-1} \times CFO Optimism_{i,t-1}) + \\ & \beta_5 (CEO Optimism_{i,t-1} \times Cash stock_{i,t-1}) + \\ & \beta_6 (CFO Optimism_{i,t-1} \times Cash stock_{i,t-1}) + \\ & \beta_7 (CEO Optimism_{i,t-1} \times CFO Optimism_{i,t-1} \times Cash stock_{i,t-1}) + \\ & \theta_1 CEO Pessimism_{i,t-1} + \theta_2 CFO Pessimism_{i,t-1} + \\ & \theta_3 (CEO Pessimism_{i,t-1} \times Cash Stock_{i,t-1}) + \\ & \theta_4 (CEO Pessimism_{i,t-1} \times CFO Pessimism_{i,t-1}) + \\ & \theta_5 (CFO Pessimism_{i,t-1} \times Cash Stock_{i,t-1}) + \\ & \theta_6 (CFO Pessimism_{i,t-1} \times Cash Stock_{i,t-1} \times Cash stock_{i,t-1}) + \end{aligned}$$

$$\varphi \text{ CEO CFO specific controls}_{i,t-1} + \delta \text{ Firm specific controls}_{i,t-1} \alpha_i + \gamma_t + \varepsilon_{i,t} \quad (3.9)$$

Alternative team model and cash stock interaction model:

$$\begin{aligned} \text{ESG (E,S) Score}_{i,t} = & \alpha_0 + \beta_1 \text{Cash Stock}_{i,t-1} + \beta_2 \text{OptimistNeutrTeam}_{i,t-1} + \\ & + \beta_3 \text{PessimistNeutrTeam}_{i,t-1} + \beta_4 \text{BalancedTeam}_{i,t-1} + \\ & \beta_5 (\text{OptimistNeutrTeam}_{i,t-1} \times \text{Cash Stock}_{i,t-1}) + \\ & \beta_6 (\text{PessimistNeutrTeam}_{i,t-1} \times \text{Cash Stock}_{i,t-1}) + \\ & \beta_7 (\text{BalancedTeam}_{i,t-1} \times \text{Cash Stock}_{i,t-1}) + \\ & \varphi \text{ CEO CFO specific controls}_{i,t-1} + \delta \text{ Firm specific controls}_{i,t-1} + \alpha_i + \gamma_t + \varepsilon_{i,t} \end{aligned} \quad (3.10)$$

3.2 CSR, Managerial-Risk Taking Incentives and Overconfidence (Pessimism)

This section presents the sample details, key independent and control variables, and summary statistics for the second study.

3.2.1 Data and Variables

The managerial risk-taking incentive data are obtained from Naveen L.'s dataset (n.d), constructed using the methodologies outlined by Coles et al. (2006, 2013) and Core and Guay (2002). Executive characteristics are sourced from the ExecuComp database, company financial information is drawn from Compustat, and corporate social responsibility (CSR) scores are retrieved from the Refinitiv database. Measures of executive overconfidence and pessimism, developed in the first study, are also derived using data from ExecuComp. Consistent with Bouslah et al. (2018) and McGuire (2019),

financial firms are excluded from the analysis by omitting firms with Standard Industrial Classification (SIC) codes between 6000 and 7000.

The sample is constructed by merging data from Naveen L.'s dataset (n.d) with Refinitiv CSR data and ExecuComp executive characteristics data, keeping exclusively U.S.-listed firms and executives who served as either CEO or CFO. Executives who served in both roles at any point during the sample period are excluded. Additionally, observations (OBS) are removed in cases where multiple CEOs or CFOs are recorded for the same firm and year, to ensure a precise one-to-one mapping between executive and firm-year. The measures of overconfidence and pessimism used in the analysis are sourced from the first study. The governance (G) construct of ESG is omitted from the scope of the study since it is perceived as a distinct construct, separate from the Environmental and Social dimensions of ESG. (Mc Guire et al., 2019; Fabrizi et al., 2014)

The main sample period spans from 2006 to 2022, while the sub-sample period covers 2011 to 2019. The main sample includes 1,561 non-financial firms, 3,499 CEOs, and 4,318 CFOs. The sub-sample comprises 1,478 non-financial firms, 2,481 CEOs, and 2,908 CFOs. The starting year of 2006 is selected for two key reasons. First, the implementation of FAS 123R in 2006 mandated that equity-based compensation be expensed and reported in financial statements at fair value, leading to a notable decline in firms' use of option-based compensation. Second, 2006 marks the first year the ExecuComp database began reporting CFO option data. Third, because of the improved compensation transparency following the 2006 Securities and Exchange Commission (SEC) overhaul of proxy disclosure rules. (McGuire et al., 2019) Following Ikram et al. (2020) and Bouslah et al. (2018), this study examines the relationship between managerial risk-taking incentives and corporate social responsibility (CSR) over a long and extended

period of 16 years. Consistent with the approach in Bouslah et al. (2018), the sub-sample period (2011–2019) is separately analysed to focus on the post-crisis dynamics, eliminating the effects of the Great Recession and the COVID-19 pandemic.

The control variables employed are consistent with those used in the first study; however, $\log_tdc1CEO$ is excluded, as its inclusion did not yield robust results.

Table 3.5 presents the model variables along with their definitions.

Table 3.5 *Model Variables (i: firm, t: year)*

Dependent Variables	Measurement
$ESG_{i,t}$ (Decimals)	ESG score from Refinitiv for any given year and firm.
$E_{i,t}$ (Decimals)	E (environment) pillar score from Refinitiv for any given year and firm
$S_{i,t}$ (Decimals)	S (social) pillar score from Refinitiv for any given year and firm
Independent Variables	
$\Delta CEO_{i,t}$ (in \$000s)	A dollar change in CEO wealth associated with a 1% change in the firm's stock price
$\Delta CFO_{i,t}$ (in \$000s)	Dollar change in CFO wealth associated with a 1% change in the firm's stock price
$\Delta CEO_{i,t}$ (in \$000s)	Dollar change in CEO wealth associated with a 1% change in the standard deviation (volatility) of the firm's returns
$\Delta CFO_{i,t}$ (in \$000s)	Dollar change in CFO wealth associated with a 1% change in the standard deviation (volatility) of the firm's returns
Control Variables	
Firm-Specific Control Variables	
$\log_Assets_{i,t}$ (Assets:\$Million)	Natural log of the book value of total assets for any given year and firm Compustat: $\log(at)$
$ROA_{i,t}$ (Decimals)	Net income/Total Assets for any given year and firm Compustat: ni/at
$debt_over_equity_w_{i,t}$ (Decimals)	$[Long\text{-}term\ debt + debt\ in\ current\ liabilities] / [common\ shares\ outstanding \times Stock\ price\ closing\ for\ fiscal\ year\ end]$ for any given year and firm. Compustat: $(dltt+dlc) / (csho * prcc_f)$. Dltt, dlc in \$Million, csho in \$Millions

risk_adj_ret _{i,t}	(Annual Log Stock return - Average of monthly 3-month bill rates/100)/ (Standard deviation of weekly returns for the year x Sqrt (52)) ⁶ for any given year and firm (in decimals)
CEO/CFO Specific Control Variables	
ageCEO _{i,t}	The age of a CEO for any given year and firm
shrown_tot_pctCEO _{i,t} (In percentage.)	The percentage of total shares outstanding held by the executive for any given year and firm. ExecuComp: shrown_tot_pct
log_tdc1CEO _{i,t} (In \$thousands)	Natural log of compensation+1 for any given year and firm ExecuComp: TDC1 ⁷
tenureCEO _{i,t}	CEO tenure for any given year and firm ExecuComp: (calendar year end- joined_co) /365 or the number of years the executive appears in the database up to the current year ⁸
gender_dummyCEO _{i,t}	A dummy variable equal to 1 if the CEO is female
ageCFO _{i,t}	The age of a CFO for any given year and firm
shrown_tot_pcCFO _{i,t} (In percentage)	The percentage of total shares outstanding held by the executive for any given year and firm. ExecuComp: shrown_tot_pct
log_tdc1CFO _{i,t} (In \$thousands)	Natural log of compensation +1 for any given year and firm ExecuComp: TDC1
tenureCFO _{i,t}	CFO tenure for any given year and firm ExecuComp: (calendar year end- joined_co) /365 or the number of years the executive appears in the database up to the current year
gender_dummyCFO _{i,t}	A dummy variable equal to 1 if the CFO is female for any given year and firm
Moderating Variables	
Executive Overconfidence and Pessimism Measures	
Opt_YONDER_CFO _{i,t}	A dichotomous variable for CFO optimism level as per Eichholtz and Yonder (2023) for any given year and firm
Pess_YONDER_CFO _{i,t}	A dichotomous variable for CFO pessimism level as per Eichholtz and Yonder (2023) for any given year and firm

⁶ The risk-free rates (3-month T-bills) are obtained from the CRSP risk-free rate series monthly data. Daily simple returns (RET) data from CRSP are used for the weekly and annual stock returns.

⁷ The 2006 reporting format comprises Salary, Bonus, Non-Equity Incentive Plan Compensation, Grant-Date Fair Value of Option Awards, Grant-Date Fair Value of Stock Awards, Deferred Compensation Earnings Reported as Compensation, and Other Compensation.

⁸ If joined_co is smaller than the database start date 1.1.2006 or 1.1.2011, the database start date is considered joined_co.

Opt_YONDER_CEO _{i,t}	A dichotomous variable for CEO optimism level as per Eichholtz and Yonder (2023) for any given year and firm
Pess_YONDER_CEO _{i,t}	A dichotomous variable for CEO pessimism level as per Eichholtz and Yonder (2023) for any given year and firm

The ESG, Environmental (E), and Social (S) scores from Refinitiv are reported in decimal format, ranging from 0 to 100. The key independent variables—CEO and CFO *delta* and *vega*—are expressed in \$thousands, as obtained from the Naveen L.’s dataset (n.d) , which is the inherent methodology widely used by the existing literature. (Ikram et al., 2020; Bouslah et al., 2018; and Coles et al., 2006) Detailed calculations of *delta* and *vega* are provided in the appendix.

All firm-specific financial variables are expressed in decimal form unless otherwise noted. *Log (Assets)* represents the natural logarithm of the book value of total assets, measured in \$million. *Return on Assets (ROA)* is calculated as net income divided by total assets, with both components measured in millions. The *debt-to-equity ratio* is computed as the sum of long-term debt and current liabilities related to debt, divided by the product of common shares outstanding and the fiscal year-end closing stock price. All debt-related figures and shares outstanding are also in millions.⁹*Risk-adjusted return* is the natural logarithm of the annual stock return minus the annual average of monthly 3-month Treasury bill rates (expressed in decimals), divided by the annualized standard deviation (STD. DEV) of weekly returns.

Executive age and the *percentage of outstanding shares held by CEOs and CFOs* are sourced from ExecuComp. The ownership variables are presented in percentage terms. *Log (TDC1)* is the natural logarithm of executive compensation plus one. TDC1

⁹ Winsorized by 1% at the top and bottom range following Mayberry (2020).

represents total compensation of \$thousands, as reported by ExecuComp. *Executive tenure* is calculated as the difference between the calendar year-end and the *joined_co* year, provided that the *joined_co* date occurs after the start of the sample period. If an executive's tenure predates the sample start date, the initial firm entry year is treated as the sample start. Since the *joined_co* variable is unavailable for many executives in ExecuComp, an alternative approach is used: tenure is estimated as the total number of years the executive appears in the database.

The executive overconfidence and pessimism variables are as per the first study. The overconfidence and pessimism calculations rely exclusively on Eichholtz and Yonder's (2023) methodology based on executives' option-exercising behavior. Executives are assigned a value of 1 if they are optimistic or pessimistic and zero if neither. Eichholtz and Yonder (2023) classify an executive as over-optimistic if they hold an exercisable (EXER) stock option that is at least 67% in the money. Conversely, an executive is considered pessimistic if they exercise a stock option when it is less than 30% in the money. The executive is classified as pessimistic or overconfident, provided that he exhibits the same behavior at least twice during his tenure. Option moneyness is estimated since ExecuComp does not provide such details for option holdings. To simplify the models, only the "optimism prevails assumption"¹⁰ (OPA) from the first study, it is employed. Under this assumption, if an executive exhibits both overconfident and pessimistic behaviour during their tenure, they are classified as overconfident, provided that overconfident behaviour is observed at least twice, regardless of displaying pessimistic behaviour simultaneously. The sample also includes executives who have

¹⁰ The results based on this assumption yield a larger number of optimist executives relative to the comparative count assumption in the first study while the Eichholtz and Yonder (2023) methodology delivers a larger number of pessimists due to a stricter measure of pessimism of Campbel et al. (2011)

worked at multiple firms. In such cases, an executive is categorized as overconfident if identified as such in any of the firms in which they were employed. This classification is theoretically supported by Tang et al. (2015), who argue that overconfident (hubristic) individuals perceive themselves as superior to the average person. Consequently, overconfidence can be reasonably assumed to dominate pessimism as a stable personal trait.

Table 3.6 and 3.7 present summary statistics for the ESG, Environmental (E), and Social (S) scores; the key independent variables—managerial *delta* and *vega*; and firm- and executive-level control variables for the main sample (2006–2022) and the subsample (2011–2019) periods, respectively.

Table 3.6 2006-2022 Model Variables' Descriptives

20644 Firm- Years, 1561 Firms, 3499 CEOs, 4318 CFOs

Variable	Obs.	Mean	Std. dev.	Min	Max
ESG	14,425	44.767	19.416	0.440	95.160
E	14,425	32.976	27.893	0.000	98.550
S	14,425	46.313	21.584	0.760	98.140
deltaCFO	19,490	100.754	313.461	0.000	13,614.540
deltaCEO	19,804	1,393.689	25,691.370	0.000	2,969,542.000
vegaCFO	19,705	36.743	134.996	0.000	6,643.557
vegaCEO	19,919	145.453	447.605	0.000	45,219.510
Log_Assets	20,540	7.897	1.656	1.763	13.590
ROA	20,540	0.042	0.131	-2.541	1.626
debt_over_equity_w	20,318	0.438	0.775	0.000	6.043
risk_adj_ret	20,012	0.303	0.990	-3.350	4.163
ageCFO	19,139	51.734	6.564	30.000	77.000
ageCEO	19,872	56.457	6.881	28.000	91.000
shrown_tot_pctCFO	16,265	0.226	0.473	0.000	18.800
shrown_tot_pctCEO	17,858	2.205	5.160	0.000	69.100
log_tdc1CFO	19,681	7.481	0.829	0.000	11.593

log_tdc1CEO	19,899	8.454	1.014	0.000	12.599
tenureCFO	19,705	4.758	3.315	0.068	17.008
tenureCEO	19,919	6.488	4.023	0.249	17.008
gender_dummyCFO	19,705	0.111	0.315	0.000	1.000
gender_dummyCEO	19,919	0.046	0.210	0.000	1.000

Table 3.7 2011-2019 Model Variables' Descriptives

11,330 Firm-years, 1478 Firms, 2481 CEOs, 2908 CFOs

Variable	Obs.	Mean	Std. dev.	Min	Max
ESG	8,288	43.351	19.087	0.440	93.130
E	8,288	31.091	27.719	0	98.550
S	8,288	44.693	21.235	0.760	98.140
deltaCEO	10,845	1,200.193	9,779.987	0	486,621.000
deltaCFO	10,762	99.596	325.178	0	13,614.540
vegaCEO	10,924	137.891	317.595	0	9,442.926
vegaCFO	10,903	37.345	165.406	0	6,643.557
Log_Assets	11,272	7.903	1.647	1.832	13.483
ROA	11,272	0.042	0.124	-2.541	1.025
debt_over_equity_w	11,145	0.414	0.705	0	5.350
risk_adj_ret	11,015	0.404	1.011	-3.047	4.163
ageCEO	10,922	56.693	6.801	30.000	88.000
ageCFO	10,888	52.064	6.379	30.000	75.000
shrown_tot_pctCEO	10,678	1.982	4.761	0	64.718
shrown_tot_pctCFO	10,373	0.212	0.377	0	7.534
log_tdc1CEO	10,924	8.482	0.980	0	12.545
log_tdc1CFO	10,903	7.509	0.796	0	11.593
tenureCEO	10,924	3.569	2.253	0.997	9.003
tenureCFO	10,903	3.172	2.089	0.997	9.003
gender_dummyCEO	10,924	0.051	0.219	0	1.000
gender_dummyCFO	10,903	0.114	0.318	0	1.000

In some cases, firms received an environmental score of zero, which, according to the Refinitiv Helpdesk, may be attributed to missing ESG disclosures rather than actual environmental underperformance. The *delta* and *vega* values are recorded as zero when

the executive did not receive stock options or equity-based compensation. The average firm asset size is approximately \$11.3 billion. The mean return on assets (ROA) is 4.2%, while the average debt-to-equity ratio is 43.8%. The average risk-adjusted return is notably higher in the sub-sample period (2011–2019) at 40.4%, compared to 30.3% in the whole sample period (2006–2022). *Delta* and *vega* values are highly skewed and exhibit substantial kurtosis, particularly for CEOs and more so for *delta*. Around 20–30% of executives have *Vega* values equal to zero, which reflects the absence of outstanding stock option awards (vested or unvested), as recorded in ExecuComp. In contrast, zero values for *delta* are much less frequent. Executive characteristics are also similar across the two periods, with the main sample displaying slightly longer average tenure due to the extended study window. Approximately 5% of CEOs and 11% of CFOs in the dataset are female. On average, CEOs own 2% of firm shares, while CFOs own 0.22%.

Table 3.8 presents descriptive statistics on CEO and CFO overconfidence and pessimism for the main and sub-sample periods. Overconfident CEOs constitute between 30% and 40% of the sample, whereas the proportion for CFOs is just under 30%. Pessimistic executives represent a much smaller fraction, ranging from 2% to 4%, with CEOs again accounting for a slightly higher share.

Table 3.8 *CEO and CFO Overconfidence and Pessimism Descriptives, 2006-2022 and 2011-2019*

Sample: 20,644 Observations, 1,561 Firms

Sub-sample: 11,330 Observations, 1,478 Firms

2006-2022	<i>Obs.</i>	<i>Mean</i>	<i>Std. dev.</i>
Variable			
Opt_YONDER_OPACEO	3,498	0.372	0.483
Pess_YONDER_OPACEO	3,498	0.040	0.195

Opt_YONDER_OPACFO	4,311	0.272	0.445
Pess_YONDER_OPACFO	4,311	0.024	0.154
2011-2019	Obs.	Mean	Std. dev.
Variable			
Opt_YONDER_OPACEO	2,451	0.324	0.468
Pess_YONDER_OPACEO	2,451	0.033	0.179
Opt_YONDER_OPACFO	2,864	0.240	0.427
Pess_YONDER_OPACFO	2,864	0.017	0.130

3.2.2 Models

Models 1 and 2 are employed to demonstrate that the results are consistent with prior research findings (Mayberry, 2020; Fabrizi et al., 2014; McGuire et al., 2019; Ikram et al., 2017). Instead of using *log_tdc1CEO/CFO* as the executive characteristic control variable, the variable *shrown_tot_pctCEO/CFO*—representing the total share ownership percentage of the CEO or CFO—is utilized, as it produces more significant results across the models. Moreover, *shrown_tot_pct* is also used as a proxy for firm governance, specifically CEO power, following Li and Minor (2016). Similarly, Fabrizi et al. (2014) control for corporate governance factors such as CEO duality and board independence when examining the effects of delta, bonuses, and non-financial motivations on CSR. Therefore, including a governance-related control variable is both theoretically grounded and empirically justified.

In all models, control variables and interaction terms are introduced incrementally to assess the influence of firm and executive heterogeneity and to monitor for potential omitted variable bias. A one-period lag is applied to all control variables, key independent variables, and interaction terms. This approach helps to mitigate endogeneity, particularly by reducing simultaneity bias, which arises when explanatory variables are jointly

determined with the dependent variable. Additionally, lagging these variables helps to address reverse causality, thereby strengthening the causal interpretability of the model results.

Model 1: (Only key independent variables)

In this model (Equation 3.10), the control variables and interaction terms are omitted; the key independent variables (delta and vega) are the only regressors.

The models are also run with log transformation of delta and vega since these variables are highly skewed and have significant kurtosis. However, as outlined in the robustness section, these log-transformed models deliver results with a lower significance level than those without log transformation. Therefore, the model without log transformation is used. All models' errors are clustered by firm and year following Fabrizi et al. (2014).

$$ESG(E,S)Score_{i,t} = \alpha_0 + \beta_1 CEO\ Delta_{i,t-1} + \beta_2 CEO\ Vega_{i,t-1} + \beta_3 CFO\ Delta_{i,t-1} + \beta_4 CFO\ Vega_{i,t-1} + \alpha_i + \gamma_t + \varepsilon_{i,t} \quad (3.10)$$

α_i : Firm fixed- effects.

γ_t : Year fixed- effects.

Model 2 (Key independent variables +control variables):

In this model (Equation 3.11), only interaction terms are omitted; the key independent variables (delta and vega) and control variables are the regressors.

$$ESG(E,S)Score_{i,t} = \alpha_0 + \beta_1 CEO\ Delta_{i,t-1} + \beta_2 CEO\ Vega_{i,t-1} + \beta_3 CFO\ Delta_{i,t-1} + \beta_4 CFO\ Vega_{i,t-1} + \varphi CEO\ CFOspecific\ controls_{i,t-1} + \delta Firm\ specific\ controls_{i,t-1} + \alpha_i + \gamma_t + \varepsilon_{i,t} \quad (3.11)$$

Model 3 (Key independent variables +control variables, optimism interaction terms) as provided in equation 3.12:

$$\begin{aligned}
 ESG(E, S)Score_{i,t} = & \alpha_0 + \beta_1 CEO\ Delta_{i,t-1} + \beta_2 CEO\ Vega_{i,t-1} + \\
 & \beta_3 CFO\ Delta_{i,t-1} + \beta_4 CFO\ Vega_{i,t-1} + \beta_5 CEO\ Optimism_{i,t-1} + \\
 & \beta_6 (CEO\ Optimism_{i,t-1} \times CEO\ Delta_{i,t-1}) + \\
 & \beta_7 (CEO\ Optimism_{i,t-1} \times CEO\ Vega_{i,t-1}) + \theta_1 CFO\ Optimism_{i,t-1} + \\
 & \theta_2 (CFO\ Optimism_{i,t-1} \times CFO\ Delta_{i,t-1}) + \\
 & \theta_3 (CFO\ Optimism_{i,t-1} \times CFO\ Vega_{i,t-1}) + \\
 & \varphi CEO\ CFO\ specific\ controls_{i,t-1} + \delta Firm\ specific\ controls_{i,t-1} + \alpha_i + \\
 & \gamma_t + \varepsilon_{i,t}
 \end{aligned} \tag{3.12}$$

Model 4 (Key independent variables +control variables, pessimism interaction terms) as provided in equation 3.13:

$$\begin{aligned}
 ESG(E, S)Score_{i,t} = & \alpha_0 + \beta_1 CEO\ Delta_{i,t-1} + \beta_2 CEO\ Vega_{i,t-1} + \\
 & \beta_3 CFO\ Delta_{i,t-1} + \beta_4 CFO\ Vega_{i,t-1} + \beta_5 CEO\ Pessimism_{i,t-1} + \\
 & \beta_6 (CEO\ Pessimism_{i,t-1} \times CEO\ Delta_{i,t-1}) + \\
 & \beta_7 (CEO\ Pessimism_{i,t-1} \times CEO\ Vega_{i,t-1}) + \theta_1 CFO\ Pessimism_{i,t-1} + \\
 & \theta_2 (CFO\ Pessimism_{i,t-1} \times CFO\ Delta_{i,t-1}) + \\
 & \theta_3 (CFO\ Pessimism_{i,t-1} \times CFO\ Vega_{i,t-1}) + \varphi CEO\ CFO\ specific\ controls_{i,t-1} + \\
 & \delta Firm\ specific\ controls_{i,t-1} + \alpha_i + \gamma_t + \varepsilon_{i,t}
 \end{aligned} \tag{3.13}$$

4.RESULTS

This chapter presents the model findings, evaluates the hypotheses, and outlines the robustness tests, respectively for the first and second studies

4.1 CSR and Managerial Overconfidence (Pessimism)

4.1.2 Hypotheses 1 and 2 Evaluations

In light of these results, I find evidence supporting hypothesis 1A only for 2006-2022. Table 4.1 shows that under optimism prevails assumption (OPA) when the CEO is overconfident ESG score decreases by 1.10 points and S score around 1.47 points on average at low significance.

Table 4.1 2006-2022 Individual Optimism and Pessimism Model Results (23142 firm-years, 1685 firms)

	DEPENDENT VARIABLE: ESG SCORE				DEPENDENT VARIABLE: E SCORE				DEPENDENT VARIABLE: S SCORE			
	1	2	3	4	1	2	3	4	1	2	3	4
VARIABLES	OPA	OPA	CCA	CCA	OPA	OPA	CCA	CCA	OPA	OPA	CCA	CCA
L.Opt_YONDER_CEO	-1.064		-0.745		-0.969		-0.542		-1.478*		-1.072	
	-0.662		-0.671		-0.929		-0.933		-0.766		-0.783	
L.Pess_YONDER_CEO	2.652***		1.998**		5.337***		4.295***		2.113*		1.590	
	-1.018		-1.008		-1.586		-1.574		-1.128		-1.158	
L.Opt_YONDER_CFO	0.212		0.011		0.545		0.303		0.032		-0.125	
	-0.544		-0.538		-0.801		-0.772		-0.688		-0.679	
L.Pess_YONDER_CFO	0.389		1.503		0.641		1.924		-0.565		0.136	
	-1.126		-1.036		-2.003		-1.984		-1.282		-1.220	
L.Opt_CAMPB_CEO		-1.105*		-0.915		-1.150		-0.933		-1.464*		-1.229
		-0.650		-0.655		-0.912		-0.907		-0.755		-0.761
L.Pess_CAMPB_CEO		4.110***		3.305**		6.426***		6.123***		4.269***		3.768**
		-1.177		-1.354		-1.873		-1.913		-1.340		-1.482
L.Opt_CAMPB_CFO		0.243		-0.024		0.593		0.114		0.070		-0.185
		-0.541		-0.537		-0.797		-0.786		-0.683		-0.677
L.Pess_CAMPB_CFO		0.819		2.044		1.195		2.118		-0.742		0.434
		-1.440		-1.575		-2.419		-2.299		-1.717		-1.810
L.Log_Assets	3.309***	3.320***	3.313***	3.332***	5.624***	5.653***	5.641***	5.669***	3.175***	3.169***	3.180***	3.180***

	-0.517	-0.516	-0.517	-0.516	-0.805	-0.803	-0.803	-0.802	-0.633	-0.632	-0.633	-0.633
L.ROA	-0.446	-0.504	-0.497	-0.482	-3.128*	-3.262*	-3.196*	-3.191*	-0.101	-0.149	-0.185	-0.132
	-1.385	-1.362	-1.381	-1.361	-1.776	-1.788	-1.781	-1.792	-1.677	-1.661	-1.675	-1.656
L.debt_over_equity_w	-0.573*	-0.571*	-0.561*	-0.559*	-0.611	-0.611	-0.593	-0.596	-0.781**	-0.777**	-0.766**	-0.760*
	-0.335	-0.335	-0.336	-0.335	-0.550	-0.550	-0.549	-0.548	-0.389	-0.389	-0.391	-0.389
L.risk_adj_ret	-0.034	-0.027	-0.035	-0.025	0.006	0.021	0.005	0.026	0.145	0.149	0.142	0.150
	-0.100	-0.101	-0.101	-0.101	-0.138	-0.139	-0.139	-0.139	-0.123	-0.123	-0.123	-0.123
L.ageCEO	-0.083**	-0.083**	-0.085**	-0.083**	-0.014	-0.011	-0.017	-0.012	0.000	-0.002	-0.003	-0.002
	-0.039	-0.039	-0.039	-0.039	-0.053	-0.053	-0.053	-0.053	-0.044	-0.044	-0.044	-0.044
L.shrown_tot_pctCEO	-0.006	-0.009	-0.004	-0.007	-0.056	-0.064	-0.053	-0.060	-0.034	-0.037	-0.031	-0.034
	-0.061	-0.061	-0.061	-0.061	-0.103	-0.102	-0.102	-0.102	-0.073	-0.073	-0.073	-0.073
L.log_tdc1CEO	0.100	0.107	0.105	0.109	-0.396	-0.373	-0.390	-0.370	0.136	0.144	0.135	0.146
	-0.216	-0.215	-0.215	-0.214	-0.319	-0.312	-0.317	-0.313	-0.243	-0.240	-0.241	-0.239
L.tenureCEO	0.294***	0.296***	0.269***	0.283***	0.155	0.170	0.121	0.150	0.201**	0.197**	0.171*	0.178*
	-0.084	-0.083	-0.085	-0.083	-0.117	-0.117	-0.118	-0.117	-0.096	-0.095	-0.096	-0.095
L.gender_dummyCEO	0.642	0.540	0.645	0.610	0.861	0.660	0.834	0.720	-0.073	-0.184	-0.093	-0.138
	-1.173	-1.167	-1.173	-1.170	-1.880	-1.882	-1.876	-1.879	-1.120	-1.118	-1.119	-1.117
L.ageCFO	0.008	0.007	0.009	0.008	-0.069	-0.071	-0.067	-0.068	0.024	0.023	0.026	0.025
	-0.031	-0.031	-0.031	-0.031	-0.047	-0.047	-0.047	-0.047	-0.037	-0.037	-0.037	-0.037
L.shrown_tot_pctCFO	0.002	0.014	0.010	0.017	0.609	0.632	0.618	0.636	-0.423	-0.415	-0.416	-0.414
	-0.440	-0.433	-0.435	-0.430	-0.560	-0.549	-0.555	-0.546	-0.426	-0.422	-0.421	-0.420
L.log_tdc1CFO	0.010	0.016	0.021	0.021	-0.033	-0.032	-0.018	-0.023	-0.025	-0.016	-0.012	-0.010

	-0.240	-0.239	-0.238	-0.238	-0.358	-0.358	-0.358	-0.357	-0.302	-0.302	-0.302	-0.302
L.tenureCFO	0.156**	0.150*	0.165**	0.164**	0.075	0.068	0.089	0.093	0.197**	0.189**	0.205**	0.202**
	-0.077	-0.077	-0.077	-0.077	-0.109	-0.110	-0.109	-0.111	-0.096	-0.096	-0.095	-0.095
L.gender_dummyCFO	0.248	0.293	0.327	0.348	-0.142	-0.092	-0.036	-0.022	-0.525	-0.475	-0.472	-0.416
	-0.617	-0.615	-0.618	-0.618	-0.940	-0.939	-0.940	-0.938	-0.839	-0.836	-0.840	-0.837
Constant	18.511***	18.413***	18.399***	18.168***	-5.856	-6.300	-6.068	-6.627	16.500***	16.597***	16.446***	16.364***
	-4.966	-4.958	-4.980	-4.960	-7.316	-7.291	-7.322	-7.301	-5.877	-5.870	-5.880	-5.869
Observations	11,266	11,266	11,266	11,266	11,183	11,183	11,183	11,183	11,183	11,183	11,183	11,183
R-squared	0.862	0.862	0.862	0.862	0.872	0.872	0.872	0.872	0.839	0.839	0.839	0.839

*Note: This table presents fixed effects regression results for three dependent variables: ESG Score, E Score, and S Score, displayed across the top panel. Under each dependent variable, Columns 1 and 2 use Yonder and Campbell's optimism and pessimism measures respectively constructed under the Optimism Prevails Assumption (OPA), while Columns 3 and 4 use the same measures constructed under the Count Comparison Assumption (CCA). Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. L. indicates one period lag. See Table 3.1 for variable descriptions. All models include firm and year fixed effects. All key independent variables, control variables, and interaction terms are lagged by one period. Standard errors are clustered at the firm level.*

I also find strong evidence in favor of hypothesis 1B for both sample periods. The pessimism coefficient is both economically and statistically significant for almost all social responsibility scores, particularly from 2006 to 2022. A pessimistic CEO has around +6 points effect on average at high significance on environmental score during 2006-2022. During the post-GFC period pessimistic CFO has +5-+5.6 points effect on ESG score on average at moderate significance and pessimistic CEO around +4 points at low significance. These results correspond to Campbell et al. (2011) measures, which deliver a more strict and lower percentage of pessimism. These imply that firms with pessimistic CEOs or CFOs could achieve an average of 5-6 points higher ESG/E/S scores. Notably, both the economic effects and the statistical significance of pessimism relative to optimism are much larger. The pessimism coefficients are largely highly significant, while the optimism coefficients are significant at low levels. It is worth underlining that CFO pessimism becomes moderately significant during the post-GFC period. This could indicate that CFOs also weighed in on CSR policy after the Great Recession.

The results support hypothesis 2A but not 2B. None of the optimism coefficients are significant for the post-GFC period. It is worth adding that Table 3 descriptives show a lower percentage of overconfident CEOs and CFOs for the post-GFC period. The evidence contradicts hypothesis 2B, the positive effect of pessimistic CEOs/CFOs on CSR is weakly significant. For instance, the existence of a pessimistic CEO has as much as +4.5 points effect on environmental score with low significance. Nevertheless, following the GFC, pessimistic CFOs also have a significant effect on CSR performance, which is not observable during the 2006-2022 period. This may indicate that CFOs play a more significant role in CSR performance after the GFC.

4.1.3 Hypothesis 3 Evaluation

The results do not support hypothesis 3A. As demonstrated in Tables 4.2 and 4.3, the optimistic team coefficients are not significant for either of the sample sets.



Table 4.2 2006-2022 Team Balance and Optimism Model Results (23142 firm- years, 1685 firms.)

VARIABLES	DEPENDENT VARIABLE: ESG SCORE				DEPENDENT VARIABLE: E				DEPENDENT VARIABLE: S			
	1	2	3	4	1	2	3	4	1	2	3	4
	<i>OPA</i>	<i>OPA</i>	<i>CCA</i>	<i>CCA</i>	<i>OPA</i>	<i>OPA</i>	<i>CCA</i>	<i>CCA</i>	<i>OPA</i>	<i>OPA</i>	<i>CCA</i>	<i>CCA</i>
L.Optimist_Team_YONDER	0.109		-0.072		0.341		0.382		-0.057		-0.170	
	-0.547		-0.555		-0.821		-0.810		-0.705		-0.706	
L.Balanced_Team_YONDER	-0.899		0.922		-4.917**		-2.652		0.299		2.069	
	-1.339		-1.152		-2.421		-2.192		-1.459		-1.398	
L.Optimist_Team_CAMPB		0.172		-0.154		0.449		0.069		-0.042		-0.381
		-0.549		-0.546		-0.813		-0.805		-0.704		-0.697
L.Balanced_Team_CAMPB		0.686		1.482		-5.453		-2.971		1.174		1.401
		-1.831		-1.988		-3.839		-3.806		-1.897		-1.830
L.Log_Assets	3.350***	3.352***	3.341***	3.342***	5.708***	5.698***	5.728***	5.700***	3.210***	3.212***	3.193***	3.196***
	-0.517	-0.518	-0.518	-0.518	-0.803	-0.802	-0.804	-0.804	-0.636	-0.636	-0.637	-0.638
L.ROA	-0.810	-0.785	-0.709	-0.718	-3.753**	-3.646**	-3.708**	-3.570**	-0.478	-0.481	-0.377	-0.417
	-1.357	-1.362	-1.373	-1.364	-1.816	-1.793	-1.810	-1.797	-1.668	-1.665	-1.680	-1.664
L.debt_over_equity_w	-0.546	-0.545	-0.549*	-0.550*	-0.589	-0.585	-0.582	-0.584	-0.743*	-0.743*	-0.748*	-0.748*
	-0.333	-0.333	-0.333	-0.333	-0.547	-0.547	-0.547	-0.547	-0.390	-0.390	-0.389	-0.390
L.risk_adj_ret	-0.044	-0.047	-0.045	-0.042	0.005	-0.004	0.006	0.007	0.127	0.128	0.124	0.132
	-0.101	-0.101	-0.101	-0.101	-0.138	-0.138	-0.139	-0.139	-0.123	-0.123	-0.123	-0.123
L.ageCEO	-0.086**	-0.086**	-0.086**	-0.085**	-0.013	-0.015	-0.012	-0.013	-0.007	-0.006	-0.007	-0.005

	-0.039	-0.039	-0.039	-0.039	-0.053	-0.053	-0.053	-0.053	-0.044	-0.044	-0.044	-0.044
L.shrown_tot_pctCEO	-0.006	-0.005	-0.005	-0.006	-0.062	-0.058	-0.060	-0.059	-0.031	-0.032	-0.031	-0.033
	-0.062	-0.062	-0.062	-0.062	-0.103	-0.103	-0.103	-0.103	-0.074	-0.074	-0.074	-0.074
L.log_tdc1CEO	0.079	0.080	0.084	0.086	-0.412	-0.406	-0.403	-0.398	0.111	0.111	0.113	0.116
	-0.214	-0.214	-0.214	-0.214	-0.314	-0.314	-0.314	-0.314	-0.239	-0.239	-0.239	-0.239
L.tenureCEO	0.251***	0.248***	0.255***	0.257***	0.122	0.119	0.122	0.128	0.136	0.136	0.138	0.145
	-0.077	-0.078	-0.077	-0.077	-0.110	-0.110	-0.110	-0.110	-0.091	-0.091	-0.091	-0.091
L.gender_dummyCEO	0.426	0.417	0.437	0.444	0.543	0.539	0.541	0.572	-0.285	-0.289	-0.282	-0.256
	-1.173	-1.173	-1.173	-1.173	-1.898	-1.899	-1.899	-1.899	-1.124	-1.124	-1.124	-1.123
L.ageCFO	0.012	0.011	0.012	0.012	-0.061	-0.061	-0.063	-0.062	0.027	0.027	0.027	0.028
	-0.031	-0.031	-0.031	-0.031	-0.047	-0.047	-0.047	-0.047	-0.037	-0.037	-0.037	-0.037
L.shrown_tot_pctCFO	0.020	0.015	0.019	0.019	0.649	0.640	0.634	0.641	-0.415	-0.416	-0.413	-0.410
	-0.428	-0.430	-0.428	-0.429	-0.541	-0.543	-0.548	-0.543	-0.419	-0.420	-0.418	-0.418
L.log_tdc1CFO	0.026	0.026	0.032	0.030	-0.032	-0.028	-0.043	-0.035	0.004	0.004	0.014	0.007
	-0.239	-0.239	-0.239	-0.239	-0.360	-0.361	-0.360	-0.360	-0.301	-0.301	-0.301	-0.301
L.tenureCFO	0.165**	0.161**	0.170**	0.171**	0.101	0.100	0.099	0.111	0.196**	0.194**	0.198**	0.206**
	-0.076	-0.076	-0.075	-0.076	-0.107	-0.107	-0.107	-0.108	-0.094	-0.094	-0.093	-0.093
L.gender_dummyCFO	0.153	0.174	0.193	0.194	-0.372	-0.322	-0.317	-0.282	-0.538	-0.536	-0.511	-0.521
	-0.627	-0.627	-0.626	-0.626	-0.940	-0.944	-0.942	-0.944	-0.847	-0.845	-0.846	-0.844
Constant	18.231***	18.267***	18.180***	18.100***	-6.751	-6.692	-6.859	-6.852	16.376***	16.387***	16.416***	16.236***
	-4.977	-4.978	-4.976	-4.974	-7.304	-7.301	-7.295	-7.292	-5.901	-5.902	-5.896	-5.896

Observations	11,266	11,266	11,266	11,266	11,183	11,183	11,183	11,183	11,183	11,183	11,183	11,183
R-squared	0.862	0.862	0.862	0.862	0.871	0.871	0.871	0.871	0.839	0.839	0.839	0.839

*Note: This table presents fixed effects regression results for three dependent variables: ESG Score, E Score, and S Score, displayed across the top panel. Under each dependent variable, Columns 1 and 2 use Yonder and Campbell's optimism and pessimism measures respectively constructed under the Optimism Prevails Assumption (OPA), while Columns 3 and 4 use the same measures constructed under the Count Comparison Assumption (CCA). Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. L. indicates one period lag. See Table 3.1 for variable descriptions. All models include firm and year fixed effects. All key independent variables, control variables, and interaction terms are lagged by one period. Standard errors are clustered at the firm level.*

Table 4.3 2011-2019 Team Balance and Optimism Model Results (12660 firm-years, 1596 firms)

	DEPENDENT VARIABLE: ESG SCORE				DEPENDENT VARIABLE: E				DEPENDENT VARIABLE: S			
	1	2	3	4	1	2	3	4	1	2	3	4
VARIABLES	OPA	OPA	CCA	CCA	OPA	OPA	CCA	CCA	OPA	OPA	CCA	CCA
L.Optimist_Team_YONDER	-0.449		-0.199		-0.905		-0.424		-0.954		-0.750	
	-0.582		-0.603		-0.838		-0.863		-0.707		-0.739	
L.Balanced_Team_YONDER	1.735		2.748*		-6.131*		-5.004*		3.272		4.604**	
	-1.911		-1.597		-3.701		-2.841		-2.175		-2.147	
L.Optimist_Team_CAMPB		-0.537		-0.451		-0.832		-0.685		-1.134		-1.110
		-0.577		-0.585		-0.821		-0.840		-0.707		-0.718
L.Balanced_Team_CAMPB		-1.164		-1.107		-12.669*		-12.575*		-3.107		-3.051
		-3.971		-3.973		-7.339		-7.349		-3.144		-3.118
L.Log_Assets	2.518***	2.509***	2.519***	2.508***	4.606***	4.562***	4.622***	4.561***	2.422***	2.401***	2.414***	2.393***
	-0.638	-0.639	-0.638	-0.638	-0.995	-0.989	-0.995	-0.989	-0.780	-0.784	-0.779	-0.783
L.ROA	0.485	0.425	0.511	0.411	-3.370*	-3.027*	-3.427*	-3.050*	1.042	0.935	1.100	0.932

	-1.476	-1.447	-1.488	-1.446	-1.814	-1.775	-1.804	-1.776	-2.122	-2.064	-2.143	-2.064
L.debt_over_equity_w	-0.994**	-0.991**	-0.989**	-0.989**	-1.542**	-1.553**	-1.541**	-1.550**	-1.034*	-1.028*	-1.030*	-1.027*
	-0.484	-0.483	-0.484	-0.484	-0.704	-0.704	-0.705	-0.704	-0.599	-0.598	-0.598	-0.598
L.risk_adj_ret	-0.077	-0.076	-0.083	-0.077	-0.175	-0.183	-0.180	-0.185	0.117	0.120	0.110	0.119
	-0.105	-0.105	-0.105	-0.105	-0.147	-0.148	-0.147	-0.148	-0.128	-0.128	-0.128	-0.128
L.ageCEO	-0.025	-0.025	-0.028	-0.025	0.023	0.024	0.023	0.023	0.029	0.030	0.025	0.030
	-0.037	-0.037	-0.037	-0.037	-0.054	-0.054	-0.054	-0.054	-0.041	-0.041	-0.041	-0.041
L.shrown_tot_pctCEO	0.019	0.017	0.020	0.018	-0.075	-0.076	-0.074	-0.076	-0.058	-0.061	-0.056	-0.061
	-0.057	-0.057	-0.057	-0.057	-0.082	-0.082	-0.082	-0.082	-0.057	-0.057	-0.057	-0.057
L.log_tdc1CEO	0.229	0.226	0.224	0.226	-0.070	-0.100	-0.067	-0.101	0.140	0.132	0.131	0.132
	-0.276	-0.277	-0.276	-0.277	-0.387	-0.389	-0.386	-0.389	-0.295	-0.295	-0.295	-0.295
L.tenureCEO	0.227*	0.236*	0.214*	0.233*	0.098	0.094	0.080	0.089	-0.182	-0.164	-0.195	-0.164
	-0.126	-0.126	-0.126	-0.126	-0.184	-0.183	-0.184	-0.184	-0.142	-0.143	-0.143	-0.143
L.gender_dummyCEO	-0.059	-0.051	-0.078	-0.057	1.005	1.023	0.970	1.012	-1.190	-1.172	-1.205	-1.174
	-1.568	-1.569	-1.566	-1.568	-2.340	-2.341	-2.336	-2.340	-1.446	-1.446	-1.445	-1.446
L.ageCFO	0.059*	0.060*	0.061*	0.060*	-0.057	-0.053	-0.060	-0.053	0.098**	0.099**	0.101**	0.099**
	-0.033	-0.033	-0.033	-0.033	-0.049	-0.049	-0.049	-0.049	-0.042	-0.042	-0.042	-0.042
L.shrown_tot_pctCFO	-0.416	-0.378	-0.416	-0.385	0.138	0.107	0.014	0.095	-0.212	-0.133	-0.187	-0.134
	-0.770	-0.760	-0.771	-0.760	-0.984	-0.954	-1.011	-0.955	-0.954	-0.935	-0.954	-0.934
L.log_tdc1CFO	-0.263	-0.252	-0.262	-0.252	-0.516	-0.489	-0.526	-0.489	-0.491	-0.466	-0.487	-0.467
	-0.239	-0.240	-0.239	-0.240	-0.342	-0.344	-0.341	-0.344	-0.309	-0.309	-0.309	-0.309
L.tenureCFO	0.123	0.127	0.108	0.124	-0.001	-0.006	-0.021	-0.012	0.140	0.149	0.126	0.150

	-0.116	-0.116	-0.116	-0.117	-0.164	-0.163	-0.164	-0.164	-0.145	-0.145	-0.146	-0.146
L.gender_dummyCFO	0.523	0.521	0.514	0.516	0.302	0.352	0.274	0.343	-0.295	-0.297	-0.299	-0.299
	-0.724	-0.726	-0.723	-0.726	-0.968	-0.967	-0.965	-0.966	-0.977	-0.980	-0.978	-0.981
Constant	20.102***	20.013***	20.305***	20.059***	0.617	0.780	0.785	0.865	22.342***	22.166***	22.575***	22.189***
	-6.081	-6.081	-6.084	-6.082	-9.209	-9.175	-9.206	-9.177	-7.041	-7.059	-7.039	-7.059
Observations	7038	7038	7038	7038	7013	7013	7013	7013	7013	7013	7013	7013
R-squared	0.907	0.907	0.907	0.907	0.919	0.919	0.918	0.919	0.888	0.888	0.888	0.888

*Note: This table presents fixed effects regression results for three dependent variables: ESG Score, E Score, and S Score, displayed across the top panel. Under each dependent variable, Columns 1 and 2 use Yonder and Campbell's optimism and pessimism measures respectively constructed under the Optimism Prevails Assumption (OPA), while Columns 3 and 4 use the same measures constructed under the Count Comparison Assumption (CCA). Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. L. indicates one period lag. See Table 3.1 for variable descriptions. All models include firm and year fixed effects. All key independent variables, control variables, and interaction terms are lagged by one period. Standard errors are clustered at the firm level.*

The CEO–CFO interaction model yields mixed results, also offering no support for Hypothesis 3. While the interaction terms for optimistic CEOs and CFOs are statistically significant in both the full and sub-sample periods, the direction of the effect is positive in the former and negative in the latter. A similar pattern emerges for the pessimism interaction term, which is positive in the main sample but turns negative in the sub-sample period.

The results do not support hypothesis 3B since balanced team coefficients are significant, particularly in the post-GFC period. From 2006 to 2022 such effect is observed only on environmental score. (-4.91 coefficient at moderate significance). However, their effect on social responsibility performance is ambiguous. Balanced teams consistently have negative effect on environmental scores (low significance) in contrast to positive effect on social (moderate significance) and ESG scores (low significance). Erol et al. (2021) argue that for REITs, environmental policies and activities involve high financial costs that may drain off capital and other company resources and lead to decreasing market returns. On the other hand, they find that, particularly after the Great Recession, social performance had a positive impact on the firm's financial performance. Thus, the negative effect of balanced teams only on environmental score may be due to potential higher costs in contrast to the positive effect on social score, which may be due to its financial benefits.

4.1.4 Robustness

4.1.4.1 Revisions in Control Variables

Total debt /total assets is replaced with debt/ equity and market/book, or market average/book are discarded as control variables since they both fail to be significant in

any of the models. M/B is not replaced with another control variable since the risk-adjusted return measure also captures the firm's stock performance. As demonstrated in table 4.4 total debt/total assets is calculated as long-term debt plus debt in current liabilities over total assets (All in \$million). M/B is calculated as stock price closing for fiscal year end over book value per share, and average m/b is calculated as the annual average of daily closing prices over book value.

Table 4.4 *List of discarded model control variables*

Variable name	Measurement
Total DEBT /Total Asset	[Long term debt+debt in current liabilities]/total assets Compustat: (DLTT+ DLC)/AT
Market/Book	Stock price closing for fiscal year end/Book value per share Compustat: (PRCC_F)/BKVLP
Average Market Value/ Book	Annual Average of daily closing prices/Book Value Average _PRC (CRSP) /BKVLP

4.1.4.2. Alternative Team Model

The alternative team model (Equation 4.1) is developed to observe the outcome if one of the executives displays overconfident or pessimistic behavior while the other lacks such display. The optimistic team coefficients fail to be significant in the team balanced and optimist model. The underlying motivation for this model is to observe changes in significance if one of the executives is neutral instead of both being overconfident.

$$\begin{aligned}
 ESG_{i,t} = & \alpha_0 + \beta_1 OptimistNeutrTeam_{i,t-1} + \beta_2 PessimistNeutrTeam_{i,t-1} + \\
 & \beta_3 Balanced Team_{i,t-1} + \varphi CEO CFO controls_{i,t-1} + \\
 & \delta Firm specific controls_{i,t-1} + \alpha_i + \gamma_t + \varepsilon_{i,t}
 \end{aligned} \tag{4.1}$$

This model provides mixed results for hypothesis 1A. Tables 4.5 and 4.6 indicate a negative relationship between executive optimism and CSR for 2006-2022, as opposed

to positive relationship for the post-GFC period. However, strong evidence supports hypothesis 1B in that a positive relationship exists between executive pessimism and CSR performance. Hypothesis 2A is not supported since the results show significant but positive relationship between CSR and optimism for the post-GFC period. On the other hand, there is strong proof in favor of hypothesis 2B. The existence of pessimist- neutral team has as high as +4 points effect on CSR performance while this increases to +6 for the post-GFC period. The balanced and optimistic team model offers no proof in favor of hypothesis 3A. However, this model lends partial support for the 2006-2022 period and shows that if the optimistic executive is joined by a neutral executive, this has a negative impact on CSR performance. Balanced teams continue to affect CSR performance in the same way as in the previous team model.

Table 4.5 *Alternative Team Model Results, 2006-2022*

VARIABLES	DEPENDENT VARIABLE: ESG				DEPENDENT VARIABLE: E				DEPENDENT VARIABLE: S			
	1	2	3	4	1	2	3	4	1	2	3	4
	<i>OPA</i>	<i>OPA</i>	<i>CCA</i>	<i>CCA</i>	<i>OPA</i>	<i>OPA</i>	<i>CCA</i>	<i>CCA</i>	<i>OPA</i>	<i>OPA</i>	<i>CCA</i>	<i>CCA</i>
L.OptimistNeutr_Team_YONDER	-0.856**		-0.594		-0.996		-0.905		-1.004*		-0.761	
	-0.409		-0.425		-0.606		-0.622		-0.519		-0.545	
L.PessimistNeutr_Team_YONDER	2.025**		2.193**		3.992**		4.056***		0.615		0.277	
	-0.946		-0.865		-1.657		-1.424		-1.009		-0.995	
L.Balanced_Team_YONDER	-0.741		1.337		-4.419*		-1.975		0.140		1.972	
	-1.358		-1.183		-2.267		-2.132		-1.501		-1.458	
L.OptimistNeutr_Team_CAMPB		-0.931**		-0.625		-1.160*		-0.861		-0.994*		-0.657
		-0.406		-0.413		-0.598		-0.609		-0.514		-0.534
L.PessimistNeutr_Team_CAMPB		2.780**		2.089*		3.972**		3.811**		1.641		1.018
		-1.216		-1.228		-1.976		-1.883		-1.318		-1.330
L.Balanced_Team_CAMPB		1.048		2.002		-4.935		-1.992		1.321		1.637
		-1.719		-1.963		-3.574		-3.565		-1.897		-1.918
L.Log_Assets	3.348***	3.377***	3.355***	3.388***	5.679***	5.721***	5.718***	5.754***	3.225***	3.238***	3.233***	3.247***
	-0.519	-0.518	-0.518	-0.518	-0.805	-0.803	-0.804	-0.803	-0.637	-0.637	-0.638	-0.638
L.ROA	-0.721	-0.700	-0.654	-0.699	-3.575*	-3.492*	-3.523*	-3.483*	-0.439	-0.447	-0.378	-0.451
	-1.365	-1.362	-1.381	-1.365	-1.826	-1.808	-1.819	-1.808	-1.666	-1.657	-1.681	-1.662
L.debt_over_equity_w	-0.551*	-0.549	-0.548	-0.554*	-0.593	-0.591	-0.582	-0.588	-0.753*	-0.750*	-0.756*	-0.754*

	-0.334	-0.334	-0.335	-0.334	-0.549	-0.549	-0.549	-0.549	-0.389	-0.389	-0.390	-0.390
L.risk_adj_ret	-0.051	-0.045	-0.045	-0.043	0.003	0.005	0.015	0.013	0.115	0.121	0.118	0.124
	-0.101	-0.101	-0.102	-0.102	-0.139	-0.139	-0.139	-0.140	-0.124	-0.124	-0.124	-0.124
L.ageCEO	-0.090**	-0.088**	-0.092**	-0.089**	-0.019	-0.017	-0.021	-0.018	-0.008	-0.008	-0.009	-0.008
	-0.039	-0.039	-0.039	-0.039	-0.053	-0.053	-0.053	-0.053	-0.044	-0.044	-0.044	-0.044
L.shrown_tot_pctCEO	-0.001	-0.003	0.000	-0.004	-0.054	-0.057	-0.052	-0.056	-0.028	-0.029	-0.028	-0.030
	-0.062	-0.062	-0.061	-0.061	-0.102	-0.102	-0.101	-0.102	-0.074	-0.074	-0.074	-0.073
L.log_tdc1CEO	0.092	0.090	0.092	0.088	-0.387	-0.389	-0.380	-0.389	0.120	0.118	0.116	0.115
	-0.214	-0.214	-0.214	-0.214	-0.313	-0.315	-0.314	-0.315	-0.239	-0.239	-0.239	-0.239
L.tenureCEO	0.247***	0.245***	0.251***	0.249***	0.122	0.122	0.128	0.123	0.129	0.128	0.132	0.132
	-0.076	-0.075	-0.076	-0.076	-0.108	-0.108	-0.109	-0.109	-0.091	-0.090	-0.091	-0.091
L.gender_dummyCEO	0.540	0.476	0.573	0.488	0.798	0.647	0.848	0.693	-0.277	-0.278	-0.293	-0.273
	-1.172	-1.164	-1.177	-1.170	-1.887	-1.878	-1.884	-1.877	-1.124	-1.116	-1.127	-1.122
L.ageCFO	0.010	0.009	0.009	0.009	-0.064	-0.063	-0.066	-0.065	0.026	0.025	0.025	0.025
	-0.031	-0.031	-0.031	-0.031	-0.046	-0.046	-0.047	-0.047	-0.037	-0.037	-0.037	-0.037
L.shrown_tot_pctCFO	-0.001	-0.004	0.010	0.004	0.624	0.618	0.628	0.623	-0.441	-0.440	-0.430	-0.430
	-0.437	-0.437	-0.431	-0.434	-0.550	-0.550	-0.548	-0.549	-0.429	-0.428	-0.424	-0.424
L.log_tdc1CFO	-0.003	0.008	0.010	0.018	-0.074	-0.051	-0.079	-0.052	-0.026	-0.021	-0.007	-0.010
	-0.239	-0.239	-0.238	-0.238	-0.361	-0.361	-0.360	-0.360	-0.300	-0.300	-0.301	-0.301
L.tenureCFO	0.147**	0.141*	0.152**	0.151**	0.085	0.083	0.088	0.092	0.171*	0.167*	0.178*	0.178*
	-0.073	-0.073	-0.072	-0.073	-0.102	-0.102	-0.101	-0.101	-0.091	-0.091	-0.091	-0.091
L.gender_dummyCFO	0.191	0.223	0.247	0.230	-0.255	-0.232	-0.181	-0.183	-0.570	-0.541	-0.553	-0.540

	-0.626	-0.623	-0.625	-0.623	-0.946	-0.945	-0.946	-0.945	-0.846	-0.843	-0.846	-0.843
Constant	18.997***	18.746***	18.795***	18.422***	-5.611	-6.163	-5.933	-6.478	17.067***	17.001***	16.807***	16.656***
	-4.998	-4.977	-5.002	-4.978	-7.347	-7.303	-7.351	-7.303	-5.910	-5.898	-5.904	-5.898
Observations	11266	11266	11266	11266	11183	11183	11183	11183	11183	11183	11183	11183
R-squared	0.862	0.862	0.862	0.862	0.872	0.872	0.872	0.872	0.839	0.839	0.839	0.839

*Note: This table presents fixed effects regression results for three dependent variables: ESG Score, E Score, and S Score, displayed across the top panel. Under each dependent variable, Columns 1 and 2 use Yonder and Campbell's optimism and pessimism measures respectively constructed under the Optimism Prevails Assumption (OPA), while Columns 3 and 4 use the same measures constructed under the Count Comparison Assumption (CCA). Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. L. indicates one period lag. See Table 3.1 for variable descriptions. All models include firm and year fixed effects. All key independent variables, control variables, and interaction terms are lagged by one period. Standard errors are clustered at the firm level.*

Table 4.6 *Alternative Team Model Results, 2011-2019*

VARIABLES	DEPENDENT VARIABLE: ESG				DEPENDENT VARIABLE: E				DEPENDENT VARIABLE: S			
	1	2	3	4	1	2	3	4	1	2	3	4
	OPA	OPA	CCA	CCA	OPA	OPA	CCA	CCA	OPA	OPA	CCA	CCA
L.OptimistNeutr_Team_YONDER	0.618		0.441		0.467		0.152		0.944		0.707	
	-0.482		-0.496		-0.691		-0.696		-0.589		-0.617	
L.PessimistNeutr_Team_YONDER	2.421*		1.898		4.903*		3.078		1.092		0.967	
	-1.277		-1.249		-2.510		-2.558		-1.510		-1.479	
L.Balanced_Team_YONDER	3.012*		3.702**		-3.672		-3.530		4.313*		5.449**	
	-1.736		-1.520		-3.266		-2.738		-2.215		-2.228	
L.OptimistNeutr_Team_CAMPB		0.675		0.641		0.342		0.295		1.135*		1.090*

		-0.472		-0.474		-0.678		-0.677		-0.581		-0.592
L.PessimistNeutr_Team_CAMPB		3.206**		3.249**		5.981**		5.998**		3.016		3.091
		-1.420		-1.433		-2.692		-2.698		-1.926		-1.957
L.Balanced_Team_CAMPB		0.859		0.905		-9.047		-9.029		-0.877		-0.797
		-3.451		-3.450		-6.487		-6.490		-3.167		-3.147
L.Log_Assets	2.498***	2.491***	2.495***	2.485***	4.573***	4.536***	4.603***	4.534***	2.424***	2.393***	2.409***	2.382***
	-0.636	-0.639	-0.636	-0.638	-0.996	-0.991	-0.999	-0.992	-0.780	-0.782	-0.780	-0.782
L.ROA	0.408	0.359	0.476	0.363	-3.508*	-3.144*	-3.501*	-3.142*	0.892	0.785	1.001	0.792
	-1.496	-1.454	-1.506	-1.453	-1.803	-1.777	-1.795	-1.778	-2.126	-2.066	-2.146	-2.065
L.debt_over_equity_w	-0.991**	-0.988**	-0.995**	-0.990**	-1.528**	-1.540**	-1.543**	-1.540**	-1.026*	-1.019*	-1.023*	-1.021*
	-0.484	-0.484	-0.484	-0.484	-0.704	-0.704	-0.704	-0.704	-0.597	-0.597	-0.597	-0.597
L.risk_adj_ret	-0.075	-0.076	-0.079	-0.077	-0.176	-0.187	-0.178	-0.188	0.112	0.114	0.106	0.113
	-0.105	-0.105	-0.105	-0.105	-0.149	-0.149	-0.149	-0.149	-0.129	-0.128	-0.129	-0.128
L.ageCEO	-0.030	-0.030	-0.030	-0.030	0.015	0.015	0.020	0.015	0.023	0.022	0.020	0.022
	-0.037	-0.037	-0.037	-0.037	-0.054	-0.054	-0.054	-0.054	-0.041	-0.041	-0.041	-0.041
L.shrown_tot_pctCEO	0.018	0.016	0.019	0.016	-0.071	-0.074	-0.072	-0.073	-0.059	-0.062	-0.057	-0.062
	-0.057	-0.057	-0.057	-0.057	-0.083	-0.082	-0.082	-0.082	-0.058	-0.058	-0.058	-0.058
L.log_tdc1CEO	0.213	0.213	0.211	0.212	-0.091	-0.110	-0.079	-0.110	0.119	0.109	0.115	0.107
	-0.277	-0.277	-0.277	-0.277	-0.389	-0.390	-0.388	-0.390	-0.295	-0.295	-0.295	-0.295
L.tenureCEO	0.208*	0.209*	0.204*	0.209*	0.060	0.052	0.058	0.052	-0.221	-0.215	-0.224	-0.214
	-0.123	-0.124	-0.123	-0.124	-0.179	-0.180	-0.179	-0.180	-0.142	-0.142	-0.142	-0.142
L.gender_dummyCEO	-0.067	-0.131	-0.076	-0.140	1.001	0.897	0.981	0.894	-1.262	-1.304	-1.269	-1.319

	-1.554	-1.552	-1.557	-1.552	-2.322	-2.326	-2.328	-2.325	-1.440	-1.433	-1.440	-1.434
L.ageCFO	0.057*	0.057*	0.059*	0.056*	-0.063	-0.060	-0.065	-0.061	0.097**	0.096**	0.099**	0.095**
	-0.033	-0.033	-0.033	-0.033	-0.049	-0.049	-0.049	-0.049	-0.042	-0.042	-0.042	-0.042
L.shrown_tot_pctCFO	-0.354	-0.361	-0.379	-0.360	0.204	0.090	0.028	0.089	-0.205	-0.141	-0.195	-0.137
	-0.771	-0.758	-0.772	-0.757	-0.969	-0.948	-1.002	-0.948	-0.954	-0.932	-0.952	-0.932
L.log_tdc1CFO	-0.248	-0.225	-0.251	-0.224	-0.506	-0.464	-0.525	-0.464	-0.467	-0.428	-0.469	-0.426
	-0.239	-0.240	-0.239	-0.240	-0.341	-0.343	-0.341	-0.343	-0.310	-0.311	-0.310	-0.311
L.tenureCFO	0.105	0.111	0.100	0.109	-0.058	-0.053	-0.054	-0.054	0.112	0.115	0.101	0.113
	-0.113	-0.113	-0.113	-0.113	-0.157	-0.156	-0.156	-0.155	-0.143	-0.143	-0.144	-0.143
L.gender_dummyCFO	0.605	0.568	0.574	0.567	0.418	0.387	0.328	0.385	-0.263	-0.259	-0.278	-0.261
	-0.728	-0.726	-0.726	-0.727	-0.982	-0.967	-0.973	-0.966	-0.982	-0.983	-0.981	-0.984
Constant	20.480***	20.417***	20.583***	20.501***	1.740	1.853	1.496	1.912	22.580***	22.632***	22.852***	22.772***
	-6.078	-6.081	-6.080	-6.075	-9.193	-9.150	-9.240	-9.156	-7.062	-7.072	-7.053	-7.068
Observations	7038	7038	7038	7038	7013	7013	7013	7013	7013	7013	7013	7013
R-squared	0.907	0.907	0.907	0.907	0.919	0.919	0.919	0.919	0.888	0.888	0.888	0.888

*Note: This table presents fixed effects regression results for three dependent variables: ESG Score, E Score, and S Score, displayed across the top panel. Under each dependent variable, Columns 1 and 2 use Yonder and Campbell's optimism and pessimism measures respectively constructed under the Optimism Prevails Assumption (OPA), while Columns 3 and 4 use the same measures constructed under the Count Comparison Assumption (CCA). Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. L. indicates one period lag. See Table 3.1 for variable descriptions. All models include firm and year fixed effects. All key independent variables, control variables, and interaction terms are lagged by one period. Standard errors are clustered at the firm level.*

4.2. CSR, Managerial-Risk Taking Incentives and Overconfidence (Pessimism)

Tables 4.7-4.12 demonstrate that delta gains statistical significance in Models 3 and 4 when interacted with executive optimism and pessimism, particularly for CFOs.

Therefore, these findings partially support hypothesis 1 that, on a standalone basis, executive delta does not significantly affect CSR. The interaction between delta and CFO optimism is positive and highly significant over the full sample period and remains significant at a lower level during the sub-sample period. In contrast, the interaction between delta and CFO pessimism exhibits a weaker but statistically significant effect on firm CSR, with a negative and economically meaningful coefficient, especially during the sub-sample period. The coefficients for the interaction terms between CEO delta and optimism (negative) and CEO delta and pessimism (positive) are generally small and, in most cases, economically negligible. However, they consistently exhibit signs opposite to those observed for CFOs. Optimistic CFOs, who have a more significant effect on CSR performance, may be more inclined to engage in CSR activities as their delta increases. This may be due to delta having a more substantial behavioural influence on CFOs as a proxy for risk aversion (Chava & Purnanandam, 2010). This suggests that, irrespective of confidence levels, higher delta may prompt CFOs to pursue CSR initiatives to mitigate firm risk. It is also worth noting that the existing literature presents mixed findings regarding the effect of CEO delta on CSR, and sometimes statistically insignificant results (Ikram et al., 2017). As such, the findings in this study regarding the limited and inconsistent role of CEO delta are aligned with prior research. Thus, these findings corroborate hypothesis 1 that when interacted with managerial optimism or pessimism, delta has an ambiguous effect on CSR policy, varying in direction and significance. These results fully corroborate hypothesis 1.

Table 4.7 2006-2022 Models 1-4, ESG Dependent Variable (20,644 Firm-Years, 1561 Firms)

2006-2022	ESG DEPENDENT VARIABLE			
	MODEL 1	MODEL 2	MODEL 3	MODEL 4
	<i>Key Variables</i>	<i>Model 1 and</i>	<i>Opt.</i>	<i>Pess.</i>
	<i>Only</i>	<i>Controls</i>	<i>Moderator</i>	<i>Moderator</i>
VARIABLES				
L.deltaCEO	0.0000	0.0000	0.00008**	0.00000
	0.0000	0.0000	-0.00004	0.00000
1L.Opt_YONDER_OPACEO			-1.24835*	
			-0.69404	
1L.Opt_YONDER_OPACEO#cL.deltaC				
EO			-0.00009**	
			-0.00004	
L.deltaCFO	0.00007	-0.00113	-0.00693***	-0.00107
	-0.00057	-0.00076	-0.00191	-0.00076
1L.Opt_YONDER_OPACFO			0.26748	
			-0.57965	
1L.Opt_YONDER_OPACFO#cL.deltaCF				
O			0.00679***	
			-0.00196	
L.vegaCEO	0.00238***	0.00226***	0.00063	0.00192**
	-0.00068	-0.00077	-0.00123	-0.0008
1L.Opt_YONDER_OPACEO#cL.vegaCE				
O			0.00213	
			-0.00155	
L.vegaCFO	-0.00287*	-0.00025	0.00829**	-0.00014
	-0.00151	-0.00168	-0.00336	-0.0017
1L.Opt_YONDER_OPACFO#cL.vegaCF				
O			-0.01092***	
			-0.00375	
L.Log_Assets		2.92665***	2.89416***	2.92322***
		-0.53948	-0.53386	-0.53889
L.ROA		-0.25943	-0.05856	-0.19207
		-1.40336	-1.39163	-1.42065

L.debt_over_equity_w	-0.67178*	-0.74771**	-0.66520*
	-0.36246	-0.36178	-0.36351
L.risk_adj_ret	-0.01559	0.01511	-0.00286
	-0.10528	-0.10368	-0.10493
L.ageCEO	-0.11323**	-0.10932**	-0.11524**
	-0.04864	-0.04869	-0.04876
L.ageCFO	0.02033	0.01948	0.01952
	-0.03762	-0.03756	-0.03763
L.shrown_tot_pctCEO	-0.01492	-0.03226	-0.02002
	-0.07245	-0.07251	-0.07185
L.shrown_tot_pctCFO	0.20484	0.0799	0.22839
	-0.56767	-0.48561	-0.54566
L.tenureCEO	0.14752*	0.17757**	0.14286*
	-0.0835	-0.08655	-0.0835
L.tenureCFO	0.05579	0.05654	0.05715
	-0.06662	-0.06855	-0.06653
L.gender_dummyCEO	0.78531	0.81313	0.89694
	-1.2447	-1.25483	-1.24822
L.gender_dummyCFO	0.36055	0.3386	0.48479
	-0.66373	-0.65504	-0.65391
1L.Pess_YONDER_OPACEO			1.8035
			-1.11365
1L.Pess_YONDER_OPACEO#cL.deltaC			
EO			0.00056**
			-0.00027
1L.Pess_YONDER_OPACFO			0.98096
			-1.40658
1L.Pess_YONDER_OPACFO#cL.deltaC			
FO			-0.00869*
			-0.00501
1L.Pess_YONDER_OPACEO#cL.vegaC			
EO			0.00449***
			-0.00173
1L.Pess_YONDER_OPACFO#cL.vegaCF			
O			0.00355
			-0.01457

Constant	45.52891***	26.17586***	26.70618***	26.23584***
	-0.11239	-5.45052	-5.4124	-5.45268
Observations	12,414	10,212	10,201	10,201
R-squared	0.84242	0.8637	0.86426	0.86424
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Cluster Standard Error by Firms	YES	YES	YES	YES
No of Clusters	1431	1340	1339	1339

*Note: Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. See Table 3.5 for variable descriptions. Column 1 reports results where only the key independent variables, Delta and Vega, are included as regressors. Column 2 introduces the full set of control variables to the model. Column 3 adds an interaction term capturing executive optimism, while Column 4 further includes an interaction term for executive pessimism. # denotes interaction term. All models include firm and year fixed effects. All key independent variables, control variables, and interaction terms are lagged by one period. Standard errors are clustered at the firm level.*

Table 4.8 2006-2022, Models 1-4, E Dependent Variable (20,644 Firm-Years, 1561 Firms)

2006-2022	E DEPENDENT			
	MODEL 1	MODEL 2	MODEL 3	MODEL 4
	Key Variables Only	Model 1 and Controls	Opt. Moderator	Pess. Moderator
VARIABLES				
L.deltaCEO	-0.00001*	-0.00002**	0.00009*	-0.00001*
	-0.00001	-0.00001	-0.00005	-0.00001
1L.Opt_YONDER_OPACEO			-1.82188*	
			-1.0303	
1L.Opt_YONDER_OPACEO#cL.deltaCEO			-0.00012**	
			-0.00005	
L.deltaCFO	0.00178**	0.00119	-0.00533**	0.00128
	-0.0007	-0.00107	-0.00242	-0.00106
1L.Opt_YONDER_OPACFO			0.19735	
			-0.86111	
1L.Opt_YONDER_OPACFO#cL.deltaCFO			0.00750***	
			-0.00256	
L.vegaCEO	0.00357***	0.00275**	0.00115	0.00217*
	-0.00112	-0.00113	-0.00161	-0.00118

1L.Opt_YONDER_OPACEO#cL.vegaCEO		0.00218		
		-0.002		
L.vegaCFO	-0.00560***	-0.00409*	0.00288	-0.00394*
	-0.0017	-0.00211	-0.00443	-0.00209
1L.Opt_YONDER_OPACFO#cL.vegaCFO		-0.00891*		
		-0.00495		
L.Log_Assets	5.25992***	5.22929***	5.24115***	
	-0.80741	-0.80081	-0.80665	
L.ROA	-3.65922**	-3.36010*	-3.54839*	
	-1.85018	-1.82363	-1.84653	
L.debt_over_equity_w	-1.07467**	-1.17247**	-1.06215**	
	-0.51504	-0.5156	-0.51642	
L.risk_adj_ret	-0.07477	-0.02112	-0.05394	
	-0.14327	-0.13945	-0.14188	
L.ageCEO	-0.08173	-0.07749	-0.08751	
	-0.06296	-0.06273	-0.06282	
L.ageCFO	-0.07981	-0.08003	-0.08102	
	-0.05554	-0.05531	-0.05577	
L.shrown_tot_pctCEO	-0.09598	-0.11773	-0.09588	
	-0.12195	-0.12501	-0.12216	
L.shrown_tot_pctCFO	0.07572	-0.02227	0.07441	
	-0.71298	-0.63296	-0.69849	
L.tenureCEO	0.24687**	0.29292**	0.23623**	
	-0.1123	-0.11677	-0.11145	
L.tenureCFO	0.08423	0.08826	0.08813	
	-0.09685	-0.10048	-0.09618	
L.gender_dummyCEO	1.27085	1.3657	1.43053	
	-1.91579	-1.9277	-1.91098	
L.gender_dummyCFO	-0.46993	-0.52963	-0.33429	
	-1.02158	-1.01489	-1.01707	
1L.Pess_YONDER_OPACEO			3.30633*	
			-1.81226	
1L.Pess_YONDER_OPACEO#cL.deltaCEO			0.00027	
			-0.00044	
1L.Pess_YONDER_OPACFO			0.61615	

				-2.10364
1L.Pess_YONDER_OPACFO#cL.deltaCFO				-0.00657
				-0.00679
1L.Pess_YONDER_OPACEO#cL.vegaCEO				0.00886***
				-0.00273
1L.Pess_YONDER_OPACFO#cL.vegaCFO				-0.00148
				-0.03131
Constant	33.76289***	-1.87026	-1.19272	-1.50155
	-0.17218	-7.6597	-7.61748	-7.65286
Observations	12,414	10,212	10,201	10,201
R-squared	0.85019	0.87191	0.87246	0.87276
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Cluster Standard Error by Firms	YES	YES	YES	YES
No of Clusters	1431	1340	1339	1339

*Note: Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. See Table 3.5 for variable descriptions. Column 1 reports results where only the key independent variables, Delta and Vega, are included as regressors. Column 2 introduces the full set of control variables to the model. Column 3 adds an interaction term capturing executive optimism, while Column 4 further includes an interaction term for executive pessimism. # denotes interaction term. All models include firm and year fixed effects. All key independent variables, control variables, and interaction terms are lagged by one period. Standard errors are clustered at the firm level.*

Table 4.9 2006-2022, Model 1-4, S Dependent Variable (20,644 Firm-Years, 1561 Firms)

2006-2022	S DEPENDENT			
	MODEL 1	MODEL 2	MODEL 3	MODEL 4
	Key Variables Only	Model 1 and Controls	Opt. Moderator	Pess. Moderator
VARIABLES				
L.deltaCEO	0	-0.00001	0.00002	0
	0	-0.00001	-0.00003	-0.00001
1L.Opt_YONDER_OPACEO			-1.83689**	
			-0.81056	
1L.Opt_YONDER_OPACEO#cL.deltaC				
EO			-0.00003	

			-0.00003	
L.deltaCFO	0.00048	-0.00023	-0.00544***	-0.00022
	-0.00062	-0.00099	-0.00199	-0.00099
1L.Opt_YONDER_OPACFO			0.22932	
			-0.73059	
1L.Opt_YONDER_OPACFO#cL.deltaCF				
O			0.00605***	
			-0.00211	
L.vegaCEO	0.00143*	0.00153*	0.00032	0.00123
	-0.00079	-0.00085	-0.0015	-0.00087
1L.Opt_YONDER_OPACEO#cL.vegaCE				
O			0.00165	
			-0.00168	
L.vegaCFO	-0.00156	0.00013	0.00624	0.00025
	-0.00161	-0.00222	-0.00489	-0.00223
1L.Opt_YONDER_OPACFO#cL.vegaCF				
O			-0.00787	
			-0.00498	
L.Log_Assets		2.87045***	2.82418***	2.85245***
		-0.66439	-0.65793	-0.66601
L.ROA		-0.47361	-0.12331	-0.39966
		-1.73773	-1.72846	-1.75411
L.debt_over_equity_w		-0.93818**	-1.03767**	-0.93798**
		-0.42128	-0.41943	-0.42219
L.risk_adj_ret		0.12527	0.16035	0.12385
		-0.1308	-0.12725	-0.13115
L.ageCEO		-0.00342	0.00564	-0.00694
		-0.05479	-0.05538	-0.05498
L.ageCFO		0.0547	0.05346	0.05207
		-0.04435	-0.04455	-0.0443
L.shrown_tot_pctCEO		-0.06766	-0.07533	-0.07761
		-0.09019	-0.09101	-0.08906
L.shrown_tot_pctCFO		-0.34747	-0.45344	-0.31811
		-0.56599	-0.5023	-0.55573
L.tenureCEO		0.08445	0.12855	0.08044
		-0.09325	-0.09681	-0.09323

L.tenureCFO	-0.03223	-0.03072	-0.02634	
	-0.07752	-0.0785	-0.07758	
L.gender_dummyCEO	-0.22026	-0.08529	-0.12871	
	-1.09333	-1.08471	-1.10448	
L.gender_dummyCFO	-0.49036	-0.53448	-0.3987	
	-0.87584	-0.86877	-0.86703	
1L.Pess_YONDER_OPACEO			1.78697	
			-1.15395	
1L.Pess_YONDER_OPACEO#cL.deltaC				
EO			0.00092**	
			-0.00037	
1L.Pess_YONDER_OPACFO			-0.31363	
			-1.53769	
1L.Pess_YONDER_OPACFO#cL.deltaC				
FO			-0.00352	
			-0.0065	
1L.Pess_YONDER_OPACEO#cL.vegaC				
EO			0.00402	
			-0.00283	
1L.Pess_YONDER_OPACFO#cL.vegaCF				
O			0.00042	
			-0.0158	
Constant	46.98406***	21.27783***	21.86233***	21.65796***
	-0.12151	-6.45339	-6.4672	-6.47502
Observations	12,414	10,212	10,201	10,201
R-squared	0.8216	0.84162	0.84212	0.84203
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Cluster Standard Error by Firms	YES	YES	YES	YES
No of Clusters	1431	1340	1339	1339

*Note: Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. See Table 3.5 for variable descriptions. Column 1 reports results where only the key independent variables, Delta and Vega, are included as regressors. Column 2 introduces the full set of control variables to the model. Column 3 adds an interaction term capturing executive optimism, while Column 4 further includes an interaction term for executive pessimism. # denotes interaction term. All models include firm and year fixed effects. All key independent variables, control variables, and interaction terms are lagged by one period. Standard errors are clustered at the firm level.*

Table 4.10 2011-2019, Model 1-4 Results, ESG Dependent (11,330 Firm-years, 1478 Firms)

2011-2019	ESG DEPENDENT VARIABLE			
	MODEL 1	MODEL 2	MODEL 3	MODEL 4
	Key Variables Only	Model 1 and Controls	Opt. Moderator	Pess. Moderator
VARIABLES				
L.deltaCEO	0.00001	0.00002	0.00006	0.00002
	-0.00001	-0.00001	-0.00005	-0.00001
1L.Opt_YONDER_OPACEO			0.21835	
			-0.72145	
1L.Opt_YONDER_OPACEO#cL.deltaCEO			-0.00003	
			-0.00005	
L.deltaCFO	-0.00038	-0.00092	-0.00488*	-0.00075
	-0.001	-0.00093	-0.00253	-0.00095
1L.Opt_YONDER_OPACFO			0.36205	
			-0.6658	
1L.Opt_YONDER_OPACFO#cL.deltaCFO			0.00467*	
			-0.00274	
L.vegaCEO	0.00201***	0.00183**	0.00200*	0.00169*
	-0.00077	-0.00086	-0.00121	-0.00089
1L.Opt_YONDER_OPACEO#cL.vegaCEO			-0.00038	
			-0.00118	
L.vegaCFO	-0.00082	0	0.00664	-0.00075
	-0.00315	-0.00328	-0.00455	-0.00335
1L.Opt_YONDER_OPACFO#cL.vegaCFO			-0.00880**	
			-0.00443	
L.Log_Assets		2.11272***	2.12546***	2.13655***
		-0.63285	-0.63062	-0.63064
L.ROA		1.30676	1.12274	1.29054
		-1.47053	-1.46307	-1.49401
L.debt_over_equity_w		-1.22363**	-1.24518**	-1.21129**
		-0.52087	-0.52295	-0.52307
L.risk_adj_ret		-0.06787	-0.05383	-0.05954
		-0.10871	-0.1086	-0.1084
L.ageCEO		-0.02754	-0.03214	-0.0251

		-0.05095	-0.05198	-0.0512
L.ageCFO		0.05038	0.04451	0.0472
		-0.03924	-0.03967	-0.03986
L.shrown_tot_pctCEO		-0.01846	-0.04779	-0.0114
		-0.07222	-0.07446	-0.07744
L.shrown_tot_pctCFO		-0.99021	-0.78861	-0.93308
		-0.79677	-0.80338	-0.80765
L.tenureCEO		-0.1314	-0.13545	-0.14542
		-0.13967	-0.14778	-0.14278
L.tenureCFO		0.06853	0.07197	0.06522
		-0.11185	-0.11565	-0.1146
L.gender_dummyCEO		0.31913	0.16674	0.2691
		-1.69752	-1.6826	-1.68813
L.gender_dummyCFO		0.27382	0.33492	0.32919
		-0.76416	-0.76671	-0.75986
1L.Pess_YONDER_OPACEO				1.27653
				-1.38473
1L.Pess_YONDER_OPACEO#cL.deltaCEO				-0.00003
				-0.00002
1L.Pess_YONDER_OPACFO				1.53062
				-2.37177
1L.Pess_YONDER_OPACFO#cL.deltaCFO				-0.01690*
				-0.00899
1L.Pess_YONDER_OPACEO#cL.vegaCEO				0.00124
				-0.00274
1L.Pess_YONDER_OPACFO#cL.vegaCFO				0.03183**
				-0.01526
Constant	44.07287***	26.51814***	26.78438***	26.29323***
	-0.13415	-6.1704	-6.2014	-6.15743
Observations	6,712	6,239	6,231	6,231
R-squared	0.90676	0.90979	0.91002	0.91004
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Cluster Standard Error by Firms	YES	YES	YES	YES
no of clusters	1267	1211	1211	1211

Note: Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. See Table 3.5 for variable descriptions. Column 1 reports results where only the key independent variables, Delta and Vega, are included as regressors. Column 2 introduces the full set of control variables to the model. Column 3 adds an interaction term capturing executive optimism, while Column 4 further includes an interaction term for executive pessimism. # denotes interaction term. All models include firm and year fixed effects. All key independent variables, control variables, and interaction terms are lagged by one period. Standard errors are clustered at the firm level.

Table 4.11 2011-2019, Model 1-4 Results, E Dependent (11,330 Firm-years, 1478 Firms)

2011-2019	E DEPENDENT			
	MODEL 1	MODEL 2	MODEL 3	MODEL 4
	Key Variables Only	Model 1 and Controls	Opt. Moderator	Pess. Moderator
VARIABLES				
L.deltaCEO	-0.00001	0.00001	0.00011*	0.00001
	-0.00002	-0.00002	-0.00006	-0.00002
1L.Opt_YONDER_OPACEO			-0.25264	
			-1.11271	
1L.Opt_YONDER_OPACEO#cL.deltaCEO			-0.00010*	
			-0.00005	
L.deltaCFO	0.00024	0.0001	-0.00551*	0.00018
	-0.00134	-0.00134	-0.00313	-0.00135
1L.Opt_YONDER_OPACFO			-0.74943	
			-0.89813	
1L.Opt_YONDER_OPACFO#cL.deltaCFO			0.00665**	
			-0.00333	
L.vegaCEO	0.00299**	0.00312**	0.00310*	0.00313**
	-0.00142	-0.0014	-0.00159	-0.00143
1L.Opt_YONDER_OPACEO#cL.vegaCEO			0.00007	
			-0.00168	
L.vegaCFO	-0.00315	-0.00414	0.0035	-0.005
	-0.00426	-0.00432	-0.00588	-0.00427
1L.Opt_YONDER_OPACFO#cL.vegaCFO			-0.01023*	
			-0.00538	
L.Log_Assets		4.05444***	4.01387***	4.05503***
		-1.00717	-1.00441	-0.99114
L.ROA		-2.95779	-2.84578	-2.8987
		-1.95249	-1.9672	-1.95412
L.debt_over_equity_w		-2.01153***	-2.04921***	-2.00196***

		-0.75246	-0.75209	-0.75542
L.risk_adj_ret		-0.22171	-0.17515	-0.21734
		-0.15821	-0.15627	-0.15707
L.ageCEO		-0.02075	-0.03739	-0.01414
		-0.06999	-0.07213	-0.06999
L.ageCFO		-0.09492	-0.11115*	-0.10668*
		-0.05815	-0.05962	-0.05968
L.shown_tot_pctCEO		-0.19472	-0.24469	-0.21482
		-0.14042	-0.1499	-0.14842
L.shown_tot_pctCFO		-0.59738	-0.20783	-0.4626
		-1.11475	-1.11579	-1.10183
L.tenureCEO		0.00634	0.04527	-0.02991
		-0.20753	-0.22697	-0.21154
L.tenureCFO		0.19205	0.25095	0.17795
		-0.16744	-0.17461	-0.16923
L.gender_dummyCEO		1.49455	1.45048	1.37643
		-2.52386	-2.49312	-2.51029
L.gender_dummyCFO		-0.01421	0.00276	0.05071
		-1.03853	-1.05075	-1.04553
1L.Pess_YONDER_OPACEO				2.78243
				-2.19457
1L.Pess_YONDER_OPACEO#cL.deltaCEO				0.00008**
				-0.00004
1L.Pess_YONDER_OPACFO				1.32493
				-3.11526
1L.Pess_YONDER_OPACFO#cL.deltaCFO				-0.00143
				-0.01418
1L.Pess_YONDER_OPACEO#cL.vegaCEO				0.00051
				-0.00531
1L.Pess_YONDER_OPACFO#cL.vegaCFO				0.02428
				-0.03008
Constant	31.67288***	5.0515	7.276	5.26809
	-0.20631	-9.33407	-9.42119	-9.27302
Observations	6,712	6,239	6,231	6,231
R-squared	0.9152	0.91874	0.91911	0.91913

Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Cluster Standard Error by Firms	YES	YES	YES	YES
No of clusters	1267	1211	1211	1211

*Note: Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. See Table 3.5 for variable descriptions. Column 1 reports results where only the key independent variables, Delta and Vega, are included as regressors. Column 2 introduces the full set of control variables to the model. Column 3 adds an interaction term capturing executive optimism, while Column 4 further includes an interaction term for executive pessimism. # denotes interaction term. All models include firm and year fixed effects. All key independent variables, control variables, and interaction terms are lagged by one period. Standard errors are clustered at the firm level.*

Table 4.12 2011-2019, Model 1-4 Results, S Dependent (11,330 Firm-years, 1478 Firms)

2011-2019	S DEPENDENT			
	MODEL 1	MODEL 2	MODEL 3	MODEL 4
	<i>Key Variables Only</i>	<i>Model 1 and Controls</i>	<i>Opt. Moderator</i>	<i>Pess. Moderator</i>
VARIABLES				
L.deltaCEO	-0.00001	-0.00001	0.00004*	-0.00001
	-0.00001	-0.00001	-0.00002	-0.00001
1L.Opt_YONDER_OPACEO			-0.58801	
			-0.81927	
1L.Opt_YONDER_OPACEO#cL.deltaCEO			-0.00002	
			-0.00002	
L.deltaCFO	0.0008	0.00005	-0.00214	0.00005
	-0.00107	-0.00104	-0.0028	-0.00104
1L.Opt_YONDER_OPACFO			0.61632	
			-0.82355	
1L.Opt_YONDER_OPACFO#cL.deltaCFO			0.00225	
			-0.00289	
L.vegaCEO	0.00102	0.00086	0.00200*	0.00067
	-0.00079	-0.00089	-0.00111	-0.00091
1L.Opt_YONDER_OPACEO#cL.vegaCEO			-0.00192	
			-0.0013	
L.vegaCFO	-0.0016	0.00115	0.00509	0.00077
	-0.00378	-0.00385	-0.00532	-0.00387
1L.Opt_YONDER_OPACFO#cL.vegaCFO			-0.00571	
			-0.0046	

L.Log_Assets	1.96531**	1.87632**	1.96901**
	-0.7864	-0.79428	-0.78741
L.ROA	0.41873	0.43413	0.32814
	-2.20899	-2.22423	-2.20853
L.debt_over_equity_w	-1.36144**	-1.39743**	-1.34825**
	-0.6236	-0.62204	-0.62655
L.risk_adj_ret	0.11161	0.1188	0.11498
	-0.13211	-0.13039	-0.13191
L.ageCEO	0.09198	0.07721	0.09344
	-0.05649	-0.05828	-0.05717
L.ageCFO	0.11301**	0.10241**	0.10511**
	-0.04918	-0.05008	-0.04976
L.shrown_tot_pctCEO	-0.10642	-0.15482*	-0.129
	-0.08998	-0.09218	-0.09533
L.shrown_tot_pctCFO	-0.81158	-0.68338	-0.72764
	-1.02576	-1.03908	-1.02867
L.tenureCEO	-0.22722	-0.17264	-0.22979
	-0.16195	-0.16597	-0.16491
L.tenureCFO	-0.23496*	-0.23059	-0.21363
	-0.13972	-0.14437	-0.14282
L.gender_dummyCEO	-1.77122	-1.59122	-1.80198
	-1.43738	-1.45051	-1.43754
L.gender_dummyCFO	-1.1444	-1.06899	-1.12669
	-0.98035	-0.97894	-0.97321
1L.Pess_YONDER_OPACEO			-0.01499
			-1.64434
1L.Pess_YONDER_OPACEO#cL.deltaCEO			0.00004*
			-0.00002
1L.Pess_YONDER_OPACFO			-0.0561
			-2.66895
1L.Pess_YONDER_OPACFO#cL.deltaCFO			-0.00238
			-0.01181
1L.Pess_YONDER_OPACEO#cL.vegaCEO			0.00552
			-0.00363
1L.Pess_YONDER_OPACFO#cL.vegaCFO			0.00306

				-0.02306
Constant	45.24170***	20.46010***	22.47093***	20.70862***
	-0.16204	-7.66669	-7.87129	-7.71616
Observations	6,712	6,239	6,231	6,231
R-squared	0.8909	0.8936	0.89388	0.89374
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Cluster Standard Error by Firms	YES	YES	YES	YES
no of clusters	1267	1211	1211	1211

*Note: Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. See Table 3.5 for variable descriptions. Column 1 reports results where only the key independent variables, Delta and Vega, are included as regressors. Column 2 introduces the full set of control variables to the model. Column 3 adds an interaction term capturing executive optimism, while Column 4 further includes an interaction term for executive pessimism. # denotes interaction term. All models include firm and year fixed effects. All key independent variables, control variables, and interaction terms are lagged by one period. Standard errors are clustered at the firm level.*

Unlike delta, CEO vega shows a statistically significant effect on CSR scores in Models 1 and 2. While CEO Vega has a positive effect on CSR scores, as evidenced by Ikram et al. (2017), CFO Vega does not have a significant effect in models 1 and 2. However, CEO optimism does not appear to moderate the relationship between CEO vega and CSR. The interaction term between vega and CEO optimism is insignificant across all models. In contrast, when interacted with CEO pessimism, vega exhibits a highly significant and positive effect on CSR scores over the full sample period. On the other hand, both optimism (-) and pessimism (+) significantly moderate the relationship between CFO vega and CSR. Optimistic CFOs reduce CSR engagement as vega increases, unlike pessimistic CFOs. More importantly, the CFO delta and optimism interaction term is economically more significant than the CFO delta coefficient alone in favour of hypothesis 2. This directional pattern supports the risk-based framework for CSR. (Godfrey 2005,2009) Since CSR functions as a form of risk management, executives with higher vega, who face greater incentives from firm volatility, may reduce

CSR engagement if they are optimistic and therefore more inclined toward risk-taking. Conversely, pessimistic executives, being more risk-averse, are more likely to increase CSR engagement even when higher firm volatility would personally benefit them. These results only partially support hypothesis 2.

Overall, the findings indicate that CFOs, rather than CEOs, have a more pronounced influence on CSR policy when executive optimism and pessimism are introduced as moderating variables. These behavioural traits, alongside compensation structures—measured through delta and vega—significantly shape CSR outcomes. Thus, the results provide evidence against hypothesis 3 that CEOs have a more pronounced effect on CSR policy than CFOs.

The interaction terms exhibit lower statistical significance during the sub-sample period than the full sample, although the number of significant variables remains relatively unchanged. Notably, the coefficient magnitudes do not differ substantially between the two periods; in fact, they are even larger for the deltaCFO and pessimism interaction (-0.02) and the vegaCFO and pessimism interaction ($+0.03$) for the sub-sample period. In the post-crisis period, the vegaCEO and pessimism interaction loses its significance, while the vegaCFO and pessimism interaction becomes significant. Conversely, the vegaCEO and pessimism interaction is significant in the full sample, whereas the corresponding CFO interaction is not. This shift suggests that in the absence of a crisis, the influence of pessimism on CSR decisions transitions from the CEO to the CFO. The larger coefficients associated with pessimism interactions may reflect the lingering effects of the Great Recession on CFOs' decision-making processes, while the reduced significance may indicate a diminished role of executive overconfidence and pessimism in shaping CSR policy decisions. Importantly, across both periods, the

direction of the effects of the interaction terms on CSR remains consistent. The results offer weak support for hypothesis 4, with limited statistical significance, and do not provide conclusive evidence that CSR policy is independent of managerial delta or vega during such periods.

The CSR Social score exhibits the weakest relationship with the moderator variables. Only a few interaction terms are statistically significant during the post-crisis period, and even those display limited economic significance. In the full sample, the deltaCEO and pessimism and deltaCFO and optimism interaction terms are significant, though the former has only a modest financial impact. In Models 1 and 2, the coefficients for delta and vega also fail to provide strong evidence of a relationship with the S score. This suggests that delta and vega exert relatively stronger effects on ESG and Environmental (E) scores than on the Social (S) score.

It is also important to note that the corresponding main effect coefficients are likewise statistically and economically significant for most statistically significant interaction terms. Furthermore, the magnitudes of these main effects are comparable to those of the interaction terms. Notably, the signs of the main and interaction effects tend to be in opposite directions for delta-related variables, while for vega-related variables, the signs align.

4.2.1 Robustness

As a robustness check, I re-estimate Models 1–4 using different logarithmic transformations. Specifically, I run the models with: (1) only delta and vega in natural logarithm form; (2) both the dependent variable and delta/vega in logarithmic form; and (3) only the dependent variable in logarithmic form. When only delta and vega were log-transformed, nearly all key independent variables and the interaction terms involving

optimism lost statistical significance. When both the dependent and key independent variables were log-transformed, the vega variables became statistically insignificant, and nearly all interaction terms also lost their significance.

The model in which only the dependent variable is expressed in natural logarithms produced results broadly comparable to those of Models 3 and 4, in terms of the number of significant variables and their significance levels. However, since most of the existing literature (Mayberry, 2020; Fabrizi et al., 2014; McGuire et al., 2019; Ikram et al., 2017) applies the logarithmic transformation primarily to delta and/or vega and considering the added complexity of interpreting log-transformed dependent variables in percentage terms, I opted to proceed with Models 3 and 4 for the primary analysis.

I also simultaneously estimate the models using all independent and control variables, without lags. This specification yielded some of the weakest results, with most interaction and main effect terms losing statistical significance. In contrast, I chose to adopt a one-period lagged model to establish temporal precedence, a fundamental requirement for causal inference. This approach also helps to mitigate endogeneity, particularly by reducing simultaneity bias: a concern when explanatory variables are jointly determined with the dependent variable. Additionally, lagging the independent variables aids in addressing reverse causality, further strengthening the validity of the model.

I also test a model specification that included only the interaction terms and control variables, while omitting the main effect and moderator variables in their standalone form (i.e., delta, vega, optimism, and pessimism). This model was estimated using the main sample and focused solely on the ESG score as the dependent variable. As with the other models, all independent and control variables were lagged by one period

to address endogeneity concerns. However, this specification failed to produce robust or statistically significant interaction terms, indicating that including standalone main effects is essential for capturing the true relationships.

As control variables, both *log_tdc1CEO/CFO* and *shrown_tot_pctCEO/CFO* were tested in the models. However, models that included both variables simultaneously yielded lower statistical significance levels than those that included only one. Specifically, the models using only *shrown_tot_pctCEO/CFO*—the percentage of shares owned by the CEO or CFO—produced more robust and statistically significant results. In contrast, models using only *log_tdc1CEO/CFO* as the control variable exhibited slightly weaker significance levels than those incorporating *shrown_tot_pctCEO/CFO*.

5. DISCUSSION

This dissertation explores two dimensions of managerial influence on CSR performance: the first study examines the direct effect of managerial overconfidence, while the second study analyzes managerial risk-taking incentives, using managerial overconfidence (and pessimism) as a moderating factor. Although both studies share the same dependent variable and interact through the concept of overconfidence, they contribute to distinct strands of literature.

5.1 CSR and Managerial Overconfidence (Pessimism)

McCarthy et al. 2017 and Tang et al. 2015 find negative relationship between CEO overconfidence and CSR. Tang et al. (2015) claim this relationship is weaker when the firm is more dependent on stakeholders for resources. The motivation of this study is to avert the misleading results that may be generated by such CEO-centred research, which misattributes the CFO overconfidence effect to CEOs, particularly for financing decisions. (Malmendier et al., 2023)

I posit negative (positive) relationship between CEO/ CFO overconfidence (pessimism) and CSR performance and the extension of such relationship to management teams. (Eichholtz and Yonder, 2023) I expect this relationship to weaken for overconfident managers (Tang et al., 2015) and strengthen for pessimistic managers following the Great Recession, 2011-2019. These assertions rest on the theories that CSR serves as a hedging tool (Godfrey, 2005 and 2009) and a product differentiation strategy. (Albuquerque et al., 2019) Moreover, the post-GFC hypotheses are grounded in the resource dependency theory (Tang et al., 2015), which stipulates managers turn to stakeholders when firm resources are scarce.

My results support McCarthy et al. (2017) and Tang et al. (2015) regarding a negative relationship between CEO overconfidence and CSR performance. My study furthers this relationship to managerial pessimism and contributes to existing research by showing statistically and economically persistent relationship between CEO/ CFO pessimism and CSR performance. In contrast to Eichholtz and Yonder (2023), I find a significant relationship between balanced teams and CSR performance, particularly for the post-GFC period. However, this relationship exerts itself positively on ESG and social performance but negatively on environmental performance. This disparity may occur due to the high costs incurred with environmental performance and the financial benefits social performance offers through enhancing social capital. (Erol et al., 202) My results affirm Tang et al. (2015) by showing weaker effect of managerial overconfidence on CSR after the Great Recession.

These findings establish the behavioral foundation of managerial influence on CSR and provide a baseline for understanding how cognitive biases, such as overconfidence and pessimism, shape sustainability-oriented decisions. This sets the stage for the second part of the dissertation, which explores how these behavioral traits interact with formal incentive structures to influence CSR.

5.2 CSR, Managerial-Risk Taking Incentives and Overconfidence (Pessimism)

The second study extends the behavioral framework by investigating how executive compensation-based incentives, namely delta and vega interact with managerial traits to affect CSR performance. The study shows that while delta and vega alone do not have affect CSR outcomes, their interactions with executive optimism and pessimism reveal important conditional effects. Notably, CEO interaction terms both for delta and vega are generally less significant, indicating that CFO traits may be more influential in

CSR decisions that carry financial or operational risk. As delta increases, an optimistic CFO appears to become more risk-averse and thus engages more in CSR, likely due to its risk-mitigating function (Godfrey, 2005; 2009). The direction of the CFO interaction effects suggests that delta, as a proxy for risk aversion (Chava & Purnanandam, 2010), may exert a stronger influence than executive confidence levels. If overconfidence were the dominant factor, one would expect an optimistic executive to engage less in CSR, consistent with the view that overconfident managers are risk-takers and less inclined toward risk-reducing strategies (McCarthy, 2017). For vega, in interaction with optimism, CFOs reduce CSR engagement as vega increases, as opposed to increasing CSR engagement when interacted with pessimism. VegaCEO optimism interaction terms fail to display statistical significance. However, when vega interacts with CEO pessimism, it displays a strong and statistically significant positive effect on CSR performance across the full sample period. These results suggest that pessimism may reverse the typical risk-seeking effect of vega, leading to increased CSR engagement. In the absence of significant CEO effects, the findings partially support the proposition that the adverse effect of vega on CSR is more pronounced when paired with executive optimism.

The results do not provide conclusive evidence that CSR policy is independent of managerial delta or vega during periods of crises. The results remain directionally consistent, although the strength of statistical significance weakens in the sub-sample. This indicates that while economic context moderates the strength of these relationships, the effect of risk-taking incentives is persistent irrespective of economic uncertainty.

Overall, the results are congruent with prior literature suggesting that executive vega has a more dominant effect on CSR performance than delta (Mayberry, 2020; Ikram et al., 2017). This dominance may stem from vega's firmer control over firm risk

(Guay,1999; Coles et al., 2006; Mao and Zhang,2018), given that CSR acts as a risk management tool (Godfrey 2005,2009) for firms.

As an original contribution to the literature, these findings show that overconfidence and risk-taking incentives are not isolated influences but dynamically interact to shape CSR behavior. This complements the first study by demonstrating that behavioral traits such as optimism and pessimism can either amplify or attenuate the effects of incentive-based compensation structures. Furthermore, this study underscores the differentiated impact of CEO and CFO characteristics on CSR, reinforcing the view that managerial influence on sustainability is dispersed across the executive team, not solely concentrated in the CEO. It also challenges existing CEO-centric theories by confirming that CFO behavior, particularly under incentive pressure can carry significant strategic weight.

Together, the two studies make parallel contributions to the CSR literature: they show that CFOs exert a strong and often underappreciated influence on CSR policy, and that managerial pessimism has a more consistent and positive impact on CSR outcomes than overconfidence.

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APPENDICES

APPENDIX A. CALCULATION OF DELTA AND VEGA

This appendix outlines the methodology for calculating vega and delta based on Coles et al. (2013), which is also adopted in Naveen L.'s dataset (n.d) for computing managerial delta and vega.

Vega And Delta Formulas:

Vega is the sensitivity of a 1% change in stock return volatility to option value. Delta is the sensitivity of a 1% change in stock price to option value. (Both are in USD value.) Based on Core and Guay (2002), vega and delta are calculated based on the Black-Scholes (1973) formula for valuing European call options, as modified to account for dividend payouts by Merton (1973)

The sensitivity with respect to a 1% change in stock price is defined in equation A.1 as:

$$\left[\frac{\partial (\text{option value})}{\partial (\text{price})} \right] \times \left(\frac{\text{price}}{100} \right) = e^{-dT} N(Z) \times \left(\frac{\text{price}}{100} \right) \quad (\text{A.1})$$

The sensitivity with respect to a 0.01 change in stock-return volatility is defined in equation A.2 as:

$$\left[\frac{\partial (\text{option value})}{\partial (\text{stock volatility})} \right] \times 0.01 = e^{-dT} N'(Z) S T^{\frac{1}{2}} \times 0.01 \quad (\text{A.2})$$

where:

N' denotes the normal density function

$$Z = [\ln(S/X) + T(r - d + \sigma^2/2)] / \sigma T^{1/2} \quad (\text{A.3})$$

N = cumulative probability function for the normal distribution

S = price of the underlying stock

X = exercise price of the option

σ = expected stock-return volatility over the life of the option

r = natural logarithm of risk-free interest rate

T = time to maturity of the option in years

d = natural logarithm of expected dividend yield over the life of the option

Option data selection:

The option data is obtained from the Outstanding Equity Awards table in ExecuComp, which sources information from DEF14A filings. Only vested and non-vested unexercised (UNEX) stock options are included in calculating delta and vega, while unearned awards are excluded from the analysis. ExecuComp provides data on option exercise prices and expiration dates by tranche; however, it does not supply information on volatility, the risk-free rate, or dividend yield. Delta and vega are calculated separately for each tranche, and the values are then summed across tranches to compute the executive's annual delta (excluding shares owned) and annual vega.

Volatility and Dividend Yield Estimation, Risk-Free Rates:

Estimating volatility and dividend yield mimics ExecuComp methodology as closely as possible.

Volatility is estimated as the annualized standard deviation (STD. DEV) of stock returns over the 60 months preceding the start of the fiscal year. A minimum of 12 months of return data is required for the calculation; if this threshold is not met, the

mean volatility across all firms is used as a substitute. The volatility estimates are winsorized at the 5th and 95th percentiles to reduce the influence of outliers.

The average of “divyield” provided by ExecuComp over the current year and the two prior years is used after winsorization at the 5th and 95th levels.

The Federal Funds rate corresponding to the option's expiration date is used for the risk-free rate. If a direct match is unavailable, the rate is interpolated. For options with maturities exceeding 10 years, the 10-year Federal Funds rate is applied. Maturity dates are as in the proxy statements, while ExecuComp makes a 30% haircut, assuming executives exercise their options early.

Calculating overall delta:

Stock delta is also included in the overall delta calculation. The delta from shares is computed as $SHROWN_EXCL_OPTIONS \times PRCCF$ (Stock price at fiscal year-end) $\times 0.01$ and added to the year's delta.

Following Guay (1999), the vega of the share portfolio is assumed to be zero.

APPENDIX B. VITAE

Neslihan Yılmaz completed her secondary education at Uskudar American Academy in 1991. She earned her BA in Business Administration from Marmara University, Turkey in 1996. Following her undergraduate degree, she began her professional career at Eczacıbaşı Artema in Turkey as an Associate in Treasury and Budgeting between 1996 and 1998. Subsequently, she completed her MSc in Finance degree from Lancaster University, UK in 1999. She then joined Is Investment Securities, also in Turkey, where she worked from 2000 to 2006 as Vice President in Global Fixed Income Markets Trading and Sales. From 2006 to 2014, she served as Associate Director in Fixed Income Trading and Institutional Sales at Maxis Investment Ltd., UK. In 2014, she moved to GMP Securities Europe, UK as Director of Global Fixed Income Sales for CEEMEA. The following year, she became the Assistant General Manager for Corporate Finance, Institutional Sales, and Research at Ziraat Securities in Turkey. From 2016 to 2018, she worked as a freelance finance trainer, covering topics such as fixed income, repo markets, general finance, and budgeting. Between 2019 and 2023, she served as a Teaching Assistant at Ozyegin University, supporting undergraduate courses in statistics, probability, operations management, marketing, macroeconomics, and business fundamentals. She also contributed to the faculty accreditation process in 2021 and 2022.