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CEO Humility and Corporate Social Irresponsibility:

Evidence Based on a New Unobtrusive Measure

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## ABSTRACT

Chief executive officers (CEOs) are expected to guard their firms against corporate socially irresponsible incidents (CSIR). In this study, we hypothesize that CEO humility relates negatively with CSIR occurrence and positively with correction due to CEO preferences for protecting stakeholder interests and employing systematic information processing. These associations are stronger in industries with a high number of CSIR incidents and when top management teams have a higher ratio of gender and racial minorities. We develop and validate a new unobtrusive measure of CEO humility using automated, objective behavioral indicators derived from earnings conference call transcripts. Our arguments and hypotheses are mostly supported by a sample of 197 Fortune 500 firms, 275 CEOs, and 1,243 firm-year observations from 2002 to 2015. Our study contributes to a more complete understanding of CEOs' role in CSIR prevention and correction, widens the scope of CEO humility research by including stakeholder-centered firm outcomes, and mitigates measurement constraints in understanding CEO humility-firm action relationships.

*Keywords:* CEO humility; Strategic leadership; Unobtrusive measure; Social Responsibility

Chief executive officers (CEOs) are leaders at the corporate apex and shoulder the ultimate responsibility for firm actions (Finkelstein et al. 2009). They are expected to guard their firms against corporate socially irresponsible incidents (CSIR; Strike et al. 2006) such as financial statement manipulation, employee discrimination, defective production, and environmental pollution. These CSIR incidents violate laws, professional codes, or ethical norms, and adversely impact stakeholder interests (Alexander 2015, Greve et al. 2010). Such incidents can trigger investor withdrawals and consumer boycotts (Chen et al. 2013, Shea and Hawn 2019) and ruin the reputations of executives and firms (Bednar et al. 2015, Kölbel et al. 2017). Such damages underscore the crucial responsibilities of CEOs for preventing and correcting CSIR incidents.

However, research and anecdotal narratives show that CEOs vary in their tendencies to prevent and correct CSIR (Schnatterly et al. 2018). For example, Volkswagen's Martin Winterkorn failed to prevent the emission scandal (Herald-Tribune 2015), and United Airlines CEO Oscar Munoz initially denied responsibility after a passenger was dragged off a plane (Forbes 2017). In contrast, some CEOs, such as Caterpillar's CEO Doug Oberhelman and Starbucks' Kevin Johnson, implemented manufacturing policies to reduce employee injuries (Walter and Smith 2011) and rectified customer mistreatment by closing stores for unconscious bias training (Tangdall 2018).

Despite these examples, existing literature provides limited insight into attributes that predict CEO effectiveness in preventing and correcting CSIR. First, while extensive research has examined CEO attributes predicting corporate social responsibility (CSR), it cannot replace research on CSIR. CSIR and CSR are independent phenomena, not opposing ends of a continuum (Wood 2010). Studies linking CSR to CEO attributes, such as values (Chin et al. 2013), abilities (Yuan et al. 2019), and traits (Petrenko et al. 2016), do not specify which CEO attributes can *prevent* or *correct* CSIR incidents. Firms have been shown to simultaneously engage in both responsible and irresponsible behaviors (Strike et al. 2006). Thus, CEO attributes promoting CSR may not necessarily prevent CSIR, as evidenced by the positive association between narcissism and both CSR and CSIR (Petrenko et al. 2016; Rijsenbilt and

Commandeur 2013). Consequently, identifying key CEO attributes that predict, prevent, and correct CSIR will offer a more complete understanding of CEOs' role in corporate social performance.

Second, upper echelons researchers typically study CSIR-prone attributes that indicate tendencies towards CSIR, but more research on CSIR-averse attributes is imperative to ensure effective CSIR guardianship. For instance, researchers have found positive correlations between CSIR and CEO attributes such as narcissism, hubris, or psychopathy (Rijsenbilt and Commandeur 2013, Stevens et al. 2012, Tang et al. 2015). These attributes suggest egocentric preferences for self-interest such as seeking attention or breaking rules, and they relate to attribute-specific CSIR-prone biases such as overestimating own abilities while underestimating dependence on stakeholders. However, having a low level of CSIR-prone attributes can only reduce egocentric preferences or attribute-specific biases, which is passive and insufficient for CSIR prevention and correction. We argue that a strong preference for protecting stakeholder interests is essential for motivating CEOs to proactively serve as guardians against CSIR.

Additionally, a preference for employing systematic information processing is crucial, because many blind spots and biases underlying CSIR stem from heuristic information processing that employs simplified strategies, rules of thumb, or mental shortcuts for decision-making (Bazerman and Tenbrunsel 2011, Hodgkinson et al. 2023). This heuristic approach impacts even individuals demonstrating low levels of CSIR-prone attributes (Moore and Gino 2015). By comparison, proactive CSIR management requires systematic information processing that emphasizes developing a comprehensive and accurate understanding of the environment, withholding self-centered judgments, and remaining open to improving their own thinking (Fredrickson 1984, Kahneman 2011, Kruglanski 1989, Samuelson and Church 2015). Therefore, it is important to identify attributes that reflect CSIR-averse preferences of protecting stakeholder interests and employing systematic information processing.

Third, although previous studies have associated CEO attributes with CSIR occurrence, they offer limited understanding of CEOs' role in CSIR correction—actions taken after CSIR occurrence to mitigate damages or improve management (Hersel et al. 2019). Our comprehension of CEOs' role in CSIR guardianship remains incomplete because firms are socially irresponsible not only when they do harm,

but also when they fail to rectify it (Campbell 2007). The crisis management research and the trust or legitimacy repair literature have extensively discussed the actions firms undertake following CSIR publicity (Bundy et al. 2017, Lewicki and Brinsfield 2017, Pfarrer et al. 2008). Many firms prefer symbolic actions such as publicizing philanthropic initiatives or making prosocial claims, aimed at burnishing firm images and diverting stakeholder attention (McDonnell and King 2013, Zavyalova et al. 2012). Conversely, some firms take substantive corrective actions such as organizational restructuring or policy changes that are intended to improve management and prevent future CSIR incidents (Hersel et al. 2019). Surprisingly, despite the significance of corrective actions for firms and stakeholders, the existing literature has not investigated the association between CEO attributes and such actions.

To address these limitations, we propose to study CEO humility, an attribute grounded in a transcendent self-view that recognizes oneself as bounded and limited, and yet capable and responsible for improvement (Grenberg 2005, Tangney 2000). Such a self-view is essentially manifested in an intrapersonal tendency to recognize self-limitations and an interpersonal tendency to appreciate others (Owens et al. 2013, Van Tongeren et al. 2023). CEO humility is crucial for CSIR prevention and correction because it enables CEOs to acknowledge their own moral and intellectual fallibility and acknowledge the legitimate interests of stakeholders, thus helping CEOs develop CSIR-averse preferences for protecting stakeholder interests and employing systematic information processing, especially through input from others (Ballantyne 2021, Kelemen et al. 2023).

Accordingly, we hypothesize that firms with humble CEOs are less likely to have CSIR incidents, and if they happen, are more likely to take corrective actions. We also examine two moderating conditions to better understand the underlying mechanisms driving the relationships. Our theory suggests that humble CEOs are more effective in preventing and correcting CSIR due to their preferences for protecting stakeholder interests and employing systematic information processing through input from others. Deriving from these arguments, we propose that the association between CEO humility and CSIR outcomes will be stronger in industries with a high number of CSIR incidents. In such environments, humble CEOs, motivated by their preference for protecting stakeholder interests, are likely to engage

more actively in preventing and correcting CSIR. We also expect the association to be stronger in the top management teams (TMTs) with a higher ratio of gender and racial minorities. In such situations, humble CEOs, motivated by their preference for systematic information processing, are more likely to benefit from the unique yet often-neglected minority voices for CSIR prevention and correction.

To test our theory, we developed and validated a novel, scalable, unobtrusive measure of CEO humility to address the limitations of existing measures. Although previous survey-based, top management team ratings (e.g., Ou et al. 2014) warrant accuracy, its scalability was constrained due to low response rates from listed firms. While video-based, third-party observer ratings (e.g., Petrenko et al. 2019) are useful for studying perceptual implications for stakeholders, perceptions can be contaminated by CEOs' impression management (Sezer et al. 2018) or uninformed observers' preconceptions (Holmes et al. 2021), making them less suitable for studying the association between inner humility and firm actions (Van Tongeren et al. 2023). Other unobtrusive CEO humility measures showed low reliability (e.g., Beauchesne 2014, Maldonado 2015). Adopting a four-phase multimethod, multisample procedure, we developed an unobtrusive measure of CEO humility that relied on automated, objective behavioral indicators derived from earnings conference call transcripts (ECCs). This measure demonstrates strong validity, reliability, and scalability. For our dependent variables, CSIR incidents and corrective actions were manually coded from media reports, and the timing of their occurrence was identified. Our arguments and hypotheses are mostly supported by a sample of 197 Fortune 500 firms, 275 CEOs, and 1,243 firm-year observations from 2002 to 2015. The results are consistent after accounting for nonrandom assignment of CEOs, sample selection biases, and other CEO traits.

Our study offers theoretical and empirical contributions to CSIR and humility research. For CSIR research, we introduce humility as a crucial attribute for CSIR prevention. We offer a theoretical explanation for why humility indicates CSIR-averse preferences for protecting stakeholder interests and employing systematic information processing. Our study suggests that the upper echelons perspective of CSIR can focus on identifying attributes that can effectively mitigate, rather than merely reflect, bounded rationality (Hodgkinson et al. 2023, Jia et al. 2021). Furthermore, we offer a more complete

understanding of CEOs' role in CSIR guardianship, by considering CEO humility as an antecedent for both CSIR prevention and correction. In addition, by identifying two moderating conditions, we demonstrate that humble CEOs particularly excel in CSIR guardianship in industries where significant stakeholder protection is needed, and in TMTs where minority voices can be leveraged to improve systematic information processing. For CEO humility research, we widen the research on the consequences of CEO humility by moving beyond shareholder-centered outcomes such as financial or market performance and focusing on stakeholder-centered outcomes like CSIR with wider societal impacts (Bapuji et al. 2020). Further, we provide a valid, reliable, and scalable unobtrusive measure of CEO humility. By demonstrating its association with firm actions, while accounting for other CEO attributes, we pave the way for a more systematic exploration of the strategic implications of CEO humility.

## **THEORY AND HYPOTHESES**

### **Corporate Social Irresponsibility and the Role of CEOs**

Our study focuses on CEO attributes that prevent and correct corporate social irresponsibility, or “the set of corporate actions that negatively affect an identifiable social stakeholder's legitimate claims” (Strike et al. 2006, p. 852). Although CSR and CSIR are regarded as positive and negative components of the same umbrella term of corporate social performance, they are independent constructs (Wood 2010). Promoting CSR involves fulfilling discretionary and philanthropic responsibilities, whereas preventing CSIR involves fulfilling legal and ethical responsibilities. In CSIR, the term “irresponsibility” can mean violating (1) criminal, civil, or administrative laws, (2) industry or professional codes; or (3) social norms or ethical principles (Carroll 1999, Greve et al. 2010, Shea and Hawn 2019). We focus on the first two categories of violation (aka, legal irresponsibility) as the most unequivocal forms of CSIR, because there is a lack of clear-cut expectation in society to judge contraventions of social norms or ethical principles (aka, social or ethical irresponsibility; Carroll 1999). Both stakeholder theorists and shareholder theorists agree that preventing legal irresponsibility is the minimum, non-discretionary corporate social responsibility requirement (Campbell 2007, Friedman 2020).

The literature about CEOs' role in CSIR has provided insight into contextual and psychological constraints that CEOs face in preventing CSIR (for reviews; Greve et al. 2010, Schnatterly et al. 2018). Agency and institutional researchers show that CEOs yield to misaligned incentives (Harris and Bromiley 2007, Zhang et al. 2008), weak board governance (Shi et al. 2016, Zorn et al. 2017), or pressures from competitors, investors, and regulators (Gonsalves 2023, Kilduff et al. 2016, Mohliver 2019). Upper echelons and behavioral ethicists offer psychological perspectives, stressing that irresponsible decisions occur when CEO perceptions, interpretations, and decision-making processes are blinded or biased by psychological factors such as experience, values, personality, affects, or intuitions (Bianchi and Mohliver 2016, Christensen et al. 2015, Moore and Gino 2015, Tang et al. 2015). These constraining perspectives portray CEOs as victims of "bounded rationality" (Cyert and March 1963) or "bounded ethicality" (Chugh and Kern 2016), assuming that CEOs are unable to overcome their constraints and make ethical decisions. In contrast, our study is built on the assumption that CEOs, as moral agents, possess capability and responsibility to overcome these constraints to prevent and correct CSIR (Ellertson et al. 2016, Ghoshal 2005). We thus focus on CEO attributes that motivate and enable them to do so (Bandura 1999).

Specifically, upper echelons researchers have tapped into personality psychology to identify CSIR-related CEO attributes and reveal two interconnected psychological causes of CSIR. The first cause is the egocentric, intentional preference for pursuing self-interest. CEOs who are driven by an egocentric preference can engage in *motivated cognition* that focuses on opportunities for satisfying self-interests (Dorminey et al. 2012), and then *behaviorally channel* their egocentric preference into committing behaviors that harm stakeholder interests (Schnatterly et al. 2018). For example, CSIR is positively associated with attributes such as hubris (Tang et al. 2015) and narcissism (Rijsenbilt and Commandeur 2013), which fall under the label of excessive self-regard (Finkelstein et al. 2009). These attributes create a sense of entitlement and drive CEOs to prioritize their own interests over others. Conversely, CSIR is negatively related to CEOs with military experience (Koch-Bayram and Wernicke 2018) or disaster experience (O'sullivan et al. 2021), who typically care about serving others and have a preference for protecting stakeholder interests.



The second cause is the often-unintentional moral blind spots and biases. Psychological attributes can serve as perceptual filters that lead to incomplete information, misinterpretation, and the formation of blind spots and biases (Hambrick and Mason 1984), all of which contribute to CSIR occurrence. For example, CEOs who start their careers in prosperous economic times tend to exhibit unwarranted optimism (Bianchi and Mohliver 2016), hubristic CEOs may overestimate their capabilities and underestimate the risks of CSIR (Tang et al. 2015), and promotion-focused CEOs may be excessively growth-oriented and risk-taking (Qian et al. 2023). All these biases may cause the CEOs to overlook the moral implications of organizational decisions, thereby increasing the likelihood of CSIR occurrence. Meanwhile, behavioral ethics researchers show that many moral blind spots and biases have a universal effect on people, regardless of individual attributes (Bazerman and Tenbrunsel 2011, Moore and Gino 2015). For example, in-group bias and stereotypes may cause CEOs to discriminate against out-group members (including stakeholders), and a present-time bias can drive them to discount the potential future costs of CSIR (Messick and Bazerman 1996).

To address these psychological causes of CSIR, we propose to search for psychological attributes that reflect preferences for protecting stakeholder interests and employing systematic information processing. With a preference for protecting stakeholder interests, CEOs are more likely to engage in motivated cognition that focuses on preventing harm to stakeholders, and then behaviorally channel their preferences into CSIR-averse actions such as reducing product defeats, employee discrimination, or toxic wastes (O'sullivan et al. 2021, Qian et al. 2023). Relatedly, a preference for employing systematic information processing helps CEOs carefully process stakeholder-related information, reducing moral blind spots and biases. As extensively discussed in cognitive psychology (Kruglanski 1989, Samuelson and Church 2015), behavioral economics (Kahneman 2011), and strategy (Fredrickson 1984), systematic information processing is a rational and comprehensive approach that improves decision-making. CEOs with this preference exhibit an *epistemic motivation* (i.e., expanding information search and developing a thorough and accurate understanding of the environment to reduce blind spots) as well as *cognitive decoupling* (i.e., detaching from egocentric reasoning, considering alternative perspectives, and updating

their thinking to correct biases). In the following, we build on these insights to argue that CEO humility reflects both preferences to improve CSIR-related decision-making.

### **CEO Humility and Its Ethical Implications**

In this study, we focus on two essential dimensions of humility: the intrapersonal dimension of recognizing one's own weaknesses and limitations, and the interpersonal dimension of appreciating the strengths and contributions of others. These two dimensions have been extensively recognized as the defining characteristics of humility (Mcelroy-Heltzel et al. 2019, Van Tongeren et al. 2023), and they serve as the foundation for the emergence of other dimensions such as low self-focus in Ou et al. (2014) or teachability and openness to ideas and advice in Owens et al. (2013). In addition, literature has indicated that humility is opposite and yet independent from related constructs such as narcissism (Tangney 2000, Zhang et al. 2017). Conceptually, humility's dimensions, knowing self-limitations and appreciating others, contrast with narcissism's characteristics of having an excessively positive view of the self and craving for applause and attention from others. Nevertheless, paradox theory explains that opposite traits (e.g., extraversion versus introversion) can coexist and merit independent investigation (Zhang et al. 2017). Empirical studies confirm that humility weakly correlates with narcissism and separately predicts outcomes (Owens et al. 2015, Zhang et al. 2017).

Research remains ambivalent about whether humble CEOs can safeguard stakeholder interests. CEO humility research has been largely informed by leadership research that focuses on the behavioral, social, or perceptual consequences of expressive humility (Kelemen et al. 2023). Studies show that humble CEOs display empowering behaviors, shape TMT social dynamics (Cortes-Mejia et al. 2021, Ou et al. 2014), influence external analysts' perceptions (Petrenko et al. 2019), and affect shareholder-centered outcomes such as firm strategies, innovation, and performance (Ou et al. 2018, Zhang et al. 2017). However, discussions regarding the ethical implications of humble CEOs are divided. Some leadership researchers applaud humble leaders for establishing ethical foundations among followers (Owens et al. 2019, Cortes-Mejia et al. 2021), while others label them as "wolves in sheep's clothing," who engage in unethical behaviors (Darren et al. 2021) and tolerate subordinate deviance (Qin et al.

2021). Furthermore, CEO researchers also debate about whether humble CEOs make less biased decisions or exhibit risk aversion and indecisiveness (Chatterjee and Hambrick 2007, Zhang and Hu 2021). Our study aims to advance an understanding of the ethical impact of CEO humility by examining its relationship with CSIR occurrence and correction.

### **CEO Humility and Corporate Social Irresponsibility**

We propose that CEO humility is negatively related to CSIR occurrence because they have strong preferences for protecting stakeholder interests and employing systematic information processing through input from others. First, humble CEOs tend to have a strong preference for protecting stakeholder interests. By recognizing their own limitations and moral fallibility (Grenberg 2005, Owens et al. 2019), humble CEOs are conscious of constraining their egoistic motives (Ballantyne 2021) and exhibiting stronger self-control (Tong et al. 2016). Relatedly, their appreciation of others enables them to acknowledge others as equally capable and valuable, whose interests are as legitimate as their own (Wright et al. 2017). Humble individuals are shown to be more helpful and generous (Exline and Hill 2012, Labouff et al. 2012), make fairer economic decisions (Hilbig and Zettler 2009), and score higher in integrity and business ethical decision tasks (Lee et al. 2008). We therefore expect that humble CEOs have a strong preference for protecting stakeholder interests. This preference influences their motivated cognition, making them more attentive to stakeholder-related issues, and driving their intentional effort to avoid causing harm to stakeholders.

Second, humble CEOs are willing to employ systematic information processing, because they admit their limited knowledge and intellectual fallibility (Ballantyne 2021, Owens and Hekman 2012), knowing that they can make flawed moral judgments (Grenberg 2005). As a result, they are *epistemically motivated* to expand information search about and from various stakeholder groups (Leary et al. 2017), so that they can recognize the ethical implications of organizational decisions on stakeholders (Smith and Kouchaki 2018). Humble CEOs are also willing to *cognitively decouple*, that is, withholding self-centered judgments while considering others' opinions (Owens and Hekman 2012, Samuelson and Church 2015). Studies demonstrate that humble people value complex knowledge (Leary et al. 2017), embrace

paradoxical tensions (Ou et al. 2018), engage in more balanced information processing (Rego et al. 2018), and revise their viewpoints when needed (Ballantyne 2021).

In particular, humble CEOs' preference for systematical information processing through inputs from others (Smith and Kouchaki 2018). For example, Li et al. (2018) showed that humble leaders were receptive to conflicting information and disagreeing voices from subordinates who may challenge their beliefs, assumptions, or biases. Hu et al. (2018) and Ou et al. (2014) showed that humble leaders create psychologically safe and empowering environments that support sharing and open discussions. In response, managers, employees, and other stakeholders may provide more information that supports humble CEOs in CSIR-related decisions.

In summary, the preference for protecting stakeholder interests explains why humble CEOs intentionally direct their attention and action towards CSIR prevention, while the preference for employing systematic information processing through input from others explains how they reduce unintentional blind spots or biases for stakeholder-related issues. Understandably, some CSIR incidents are beyond the decisions of individual CEOs, but CEOs can shape the overall decision-making preferences and information processing tendency within their firms. For example, humble CEOs can role model behaviors of protecting stakeholder interests or practices of systematic information processing, which will trickle down and drive subordinate executives and units to follow suit (Wo et al. 2015). In addition, humble CEOs can embed the stakeholder protection mindset and practices of systematic information processing in their firms as they select and promote people, reward and punish behaviors, and modify management policies and practices (Holmes et al. 2021). We posit:

**Hypothesis 1 (H1).** *CEO humility is negatively associated with the likelihood of CSIR occurrence.*

### **CEO Humility and Post-CSIR Corrective Actions**

We now turn to corrective actions taken after the public exposure of CSIR incidents. Such exposure raises CEOs' awareness of previously overlooked issues and compels firms to respond due to heightened public attention (Pfarrer et al. 2008). We examine substantive corrective actions such as organizational restructuring and policy or practice changes (Hersel et al. 2019) that are intended to improve management

and prevent future CSIR. For example, financial misreporting reveals substantial weaknesses in internal controls. Corrective actions can include reviewing revenue recognition policies, improving accounting procedures, increasing training for financial staff, enhancing external auditing, or strengthening accounting information systems (Ge and Mcvay 2005). Such actions would modify dysfunctional organizational components (Lewicki and Brinsfield 2017) and rebuild “technical, human, infrastructural, and social aspects” of firm operations (Pfarrer et al. 2008, p. 739).

To take post-CSIR corrective actions, CEOs must be willing to protect stakeholder interests and overcome blind spots and biases that can stifle their motivation to rectify the wrongdoing. When CEOs are unconcerned about stakeholder interests, they can avoid their responsibility for corrective actions through moral disengagement, or cognitive approaches to escape self-censure by justifying their moral intention, trivializing the harm, or blaming others (Bandura 2016, Dorminey et al. 2012). When CEOs are biased to overestimate their ability to control situations or discount the costs of failing to prevent CSIR, they may view corrective actions as unnecessary and turn to symbolic actions such as philanthropic giving or prosocial campaigns to deflect public attention (Zavyalova et al. 2012). For example, when Uber’s new self-driving cars were involved in traffic offenses, founder and CEO Travis Kalanick blamed human error and took no action to improve car safety (Levin 2016).

Although we propose that humble CEOs may reduce the likelihood of CSIR occurrence, they are not immune to CSIR incidents and must respond to CSIR incidents discovered during their term, regardless of whether the incidents occurred under their leadership or that of their predecessors. We propose that humble CEOs are more likely to undertake post-CSIR corrective actions. First, their strong preference for protecting stakeholder interest heightens their concern about the harm their firms have inflicted upon stakeholders. This promotes their willingness to assume responsibility for rectification and future CSIR prevention (Owens et al. 2019). It also leads them to view CSIR discovery as an opportunity to learn from ethical failures (Smith and Kouchaki 2018). Importantly, they can use these CSIR incidents to cultivate an organizational preference for protecting stakeholder interests and to role model learning from mistakes and failures (Dahlin et al. 2018, Owens and Hekman 2012). Second, because humble

CEOs prefer employing systematic information processing, their epistemic motivation and the related comprehensive information search can help them overcome present bias so that they can appreciate the long-term benefits of corrective actions. Indeed, humble people have been shown to have a strong error management orientation, characterized by engaging in constructive discussions about errors and viewing them as opportunities for improvement (Seckler et al. 2021). Relatedly, by promoting information transparency and empowering subordinates to take action (Ou et al. 2014), humble CEOs can help mitigate organizational biases favoring the status quo or resisting change (Stouten et al. 2018), thus removing the obstacles to implementing substantive corrective actions. Therefore, we expect:

**Hypothesis 2 (H2).** *CEO humility is positively associated with post-CSIR corrective actions.*

### **Moderating Conditions of the CEO humility – CSIR Relationships**

Our theory suggests that humble CEOs are more likely to reduce and correct CSIR due to their preferences for protecting stakeholder interests and employing systematic information processing through input from others. To better understand and corroborate these mechanisms, we propose two moderating conditions, namely, (1) industries with a high number of CSIR incidents and (2) firms' ratio of female and racial minority members in the TMT. We anticipate that these two moderators will strengthen the association between CEO humility and CSIR guardianship. The first condition amplifies humble CEOs' preference for protecting stakeholder interests, and the second condition enables humble CEOs to process information more systematically.

***Industries with a high number of CSIR incidents.*** One major mechanism underlying the effect of CEO humility on CSIR outcomes is humble CEOs' strong preference for protecting stakeholder interests. We expect that environments that amply this mechanism will strengthen the positive associations between CEO humility and CSIR prevention and correction. Correspondingly, we focus on the number of CSIR incidents within the industry in which the CEO and the focal firm operate, because we expect that CEOs are attentive to CSIR incidents within their respective industries, just like they closely monitor the strategic actions of their industry peers (Audia et al. 2022, Gupta and Misangyi 2018).

We expect that the effect of humble CEOs' preference for protecting stakeholder interests is amplified in industries with a high number of CSIR incidents ("high-CSIR industries") because these industries represent a context where the need for stakeholder interest protection is strong and information regarding CSIR prevention and correction is readily available. Compared with low-CSIR industries, high-CSIR industries intensify humble CEOs' focus on the harm experienced by stakeholders in CSIR incidents, thereby increasing their tendency to prevent or correct such incidents. These industries also focus humble CEOs' attention on the underlying causes of CSIR incidents. Further, numerous culpable industry peers in high-CSIR industries serve as negative role models, providing insights into effective practices for CSIR prevention and correction (Gonsalves 2023, Yiu et al. 2014). Hence, high-CSIR industries amplify humble CEOs' preference for protecting stakeholder interests, resulting in enhanced CSIR prevention and correction.

In comparison, with a weaker preference for protecting stakeholder interests, less humble CEOs tend to overlook the harm experienced by stakeholders. In high-CSIR industries, these CEOs may perceive a "safety in numbers" context, where culpable firms face less blame and can appease the public with mere symbolic actions (Zavyalova et al. 2012). Consequently, in high-CSIR industries, less humble CEOs are less inclined to invest efforts in CSIR guardianship, resulting in pronounced differences from their humbler counterparts.

Conversely, industries with a low number of CSIR incidents provide limited environmental stimuli concerning stakeholder interest protection. As a result, the manifested differences in preferences for protecting stakeholder interests between more and less humble CEOs are less pronounced, leading to minimal differences in their CSIR performance. Therefore, we propose:

**Hypothesis 3 (H3).** *(a) The negative association between CEO humility and CSIR occurrence, and (b) the positive association between CEO humility and CSIR corrective actions are stronger in high-CSIR industries.*

***Ratio of Female and Racial Minority Members in TMTs.*** The other mechanism underlying the effect of CEO humility on CSIR outcomes is humble CEOs' strong preference for utilizing systematic information processing. We anticipate that environments that enable humble CEOs to effectively leverage systematic information processing will strengthen the association of CEO humility and CSIR outcomes. We thus focus on the representation of female and racial minority members in the TMTs. Diversity literature suggests that increased team diversity provides valuable, non-redundant information to enhance decision-making (Williams and O'Reilly 1998). This is particularly relevant for female and racial minority members, as they themselves represent stakeholder groups fighting for equality and inclusion (Martin 2023), and their unique life experiences offer valuable perspectives concerning customers, employees, and suppliers (Miller et al. 2022).

TMTs with a higher ratio of female and racial minority members strengthen the relationship between CEO humility and CSIR performance because it presents a context enabling humble CEOs to utilize systematic information processing effectively. Humble CEOs are driven by epistemic motivation and cognitive decoupling to actively seek opinions from others (Li et al. 2018) while remaining receptive to opposing views (Porter and Schumann 2018). TMTs with more minority members amplify these systematic information processing tendencies by providing unique minority voices that help reduce blind spots and biases in stakeholder-related issues (Wang et al. 2023). In addition, diverse TMTs amplify humble CEOs' tendencies to integrate different opinions, facilitate consensus-building, and enhance collaboration (Ou et al. 2014), thereby further improving their effectiveness in CSIR guardianship.

In contrast, less humble CEOs are less likely to enjoy the informational advantages of diverse TMTs, because they tend to suppress or neglect the opinions of minority members (Hekman et al. 2017, Lashley and Pollock 2020). High bio-demographic diversity within the team is often associated with relational conflicts and coordination barriers (Hutzschenreuter and Horstkotte, 2013; Ndofo et al. 2015), making it difficult for less humble CEOs and their TMTs to manage CSIR prevention and correction effectively. Consequently, their ability to leverage the benefits of TMT diversity is limited, making them less effective at CSIR guardianship compared to their humbler counterparts in diverse TMTs.



On the other hand, TMTs with a lower ratio of minority members offer fewer informational benefits for decision-making. As a result, the disparity between more and less humble CEOs in terms of their utilization of systematic information processing becomes less evident, leading to less noticeable differences in their CSIR prevention and correction. We thus expect:

**Hypothesis 4 (H4).** *(a) The negative association between CEO humility and CSIR occurrence, and (b) the positive association between CEO humility and CSIR corrective actions are stronger in TMTs with a higher ratio of female and racial minority members.*

## **METHOD**

### **Overview**

We tested the hypotheses with a panel dataset of CEOs from Fortune 500 firms from 2002 to 2015 excluding financial industries. Our sample began in 2002, the first year when earnings conference call (ECC) data for our measure of CEO humility became available. To observe CSIR after CEO inauguration, we excluded CEOs who assumed their role before 2001 (Chin et al. 2013). We used lagged two-year moving average of CEO humility as the independent variable and thus excluded CEOs with fewer than three years of tenure. We manually collected two dependent variables, CSIR occurrence and corrective actions, to ensure that the incidents and actions happened under the focal CEO's administration and influence. Control variables came from archival sources as described below. The intersection of these data sources formed a final sample including 275 CEOs from 197 firms and 1,243 firm-year observations. We developed and validated a new unobtrusive measure of the independent variable CEO humility, tested the hypotheses in the Fortune 500 firm panel dataset, and conducted supplementary analyses to verify our findings. We report the most essential information in the manuscript and provide additional details in the supplementary materials (abbreviated SM below, including Appendices A to H and Tables S1 to S9).

### **Independent Variable: CEO Humility**

We followed established psychometric procedures (Flake et al. 2017, Hinkin 1998) to develop and validate an unobtrusive measure of CEO humility, paying special attention to three criteria. First, to ensure content validity, indicators should be theoretically justified (Hill et al. 2014) and empirically

verified, to support *definitional correspondence*, the extent to which the indicators correspond to the focal construct, and *definitional distinctiveness*, the extent to which the indicators correspond more to the focal construct than to other related constructs (Colquitt et al. 2019). Second, indicators should demonstrate acceptable psychometric properties including factor loading and reliability, because reliability is necessary to ensure construct validity, reliable results, and research replicability (Decelles et al. 2021, Flake et al. 2017). Third, the new measure should converge with other established measures of humility (*convergent validity*), be distinct from related constructs to prevent the proliferation of redundant constructs (*discriminant validity*), predict theoretically derived outcomes (*predictive validity*), and demonstrate scalability for panel datasets (Hill et al. 2014, Shaffer et al. 2016). Specifically, we followed a four-phase multimethod, multisample procedure as summarized in Table 1 and described below.

----- Insert Table 1 about here -----

***Phase 1: Indicator Development and Refinement.*** We started from an extensive list of 25 indicators deductively generated for multiple humility dimensions recognized in the management field (Ou et al. 2014, Owens and Hekman 2012). The indicators are from a broad range of publicly available materials, including earnings conference call transcripts (Factiva), letters to shareholders (Mergent online), executive compensation (Compustat), and board membership history (BoardEx). Like other unobtrusive measures (Chatterjee and Hambrick 2007), each indicator reflects one or more aspects of humility. Based on the ratings from 13 expert judges, item-total correlation (ITC) analysis, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and reliability analysis, we retained four indicators calculated from quarterly ECCs, contexts in which a CEO leads the top management team to interact with external parties about the firm’s past performance and prospects (Samples 1 and 2; See Appendix A in SM for more details).

The final set of indicators of our CEO humility measure includes (Appendix B in SM demonstrates the calculation): (1) the sequence when the CEO made the first comment (*ecc\_ceos*); (2) the relative comment frequency 1 (*ecc\_ect*) or the total number of times non-CEO executives spoke divided by the number of times the CEO spoke; (3) the relative comment frequency 2 (*ecc\_ect2*) or the number of

times the most frequently speaking non-CEO executive spoke divided by the number of times the CEO spoke; and (4) the relative comment length (*ecc\_ecl2*) or the highest total number of words by a non-CEO executive divided by the total number of words by the CEO. In the validation Sample 2 of 357 firm-year observations, the indicators had factor loadings passing the criteria of 0.40 (Hinkin 1998) and a convergent factor structure with acceptable reliability (Cronbach's alpha = .86) and fit indices (Hu and Bentler 1999). We log-transformed items (2), (3), and (4) to reduce the effect of skewed data distribution, standardized all four items to remove scale differences, and then calculated the average of the four items to generate quarterly humility scores for the CEO. In hypothesis testing, we followed Zhu and Chen (2015) to measure humility using two-year moving averages (years t-1 and t-2), because researchers have recognized the evolution of personality traits throughout adulthood (Tasselli et al. 2018).

**Phase 2: Content Validity.** The humility indicators reflect a CEO's *volubility relative to other TMT members* in the ECC context, indicating that humble CEOs speak in a later sequence, with less frequency, and for a shorter length than other executives. The indicators exhibit high content validity both theoretically and empirically. Theoretically, the indicators effectively capture both the intrapersonal and interpersonal dimensions of humility in CEO interactions with TMT members. Specifically, given that CEOs are at the apex of the upper echelons, low relative volubility indicates high CEO humility because (1) the intrapersonal dimension of recognizing one's own limitations is reflected in the CEO's tendency to refrain from dominating conversations, and (2) the interpersonal dimension of appreciating others motivates CEOs to actively involve TMT members in information sharing, collaboration, and joint decision-making (Ou et al. 2014). Consequently, TMT members led by humble CEOs are relatively more represented in both regular interactions and communications with significant external parties. Considering that accurate inference of internal attributes from observable behaviors requires salient situational consideration (Holmes et al. 2021, Van Tongeren et al. 2023), low volubility indicators in the ECC contexts reflect genuine internal CEO humility rather than impression management tactics. As ECCs are high-stake contexts that can motivate even introverted CEOs to actively communicate and demonstrate

credibility to influence investors' evaluation of the companies (Finno and Bruschi 2014, Lippa 1978), low volubility reflects intentional restraint of speaking stemming from genuine humility.

Empirically, the indicators passed three content validation analyses. The first was expert judge agreement (Hinkin 1998). Among 13 expert judges (Appendix A in SM), more than 70% rated the volubility indicators as relevant to the definition of CEO humility. The second and third analyses (Appendix C in SM) followed the procedures of Colquitt et al. (2019). A sample of 77 experienced U.S. employees were able to accurately sort or rate our humility indicators along with indicators of dominance, narcissism, provocativeness, extraversion, and boredom (Sample 3). Supporting content validity, our indicators demonstrated statistical evidence of moderate to strong definitional correspondence ( $p_{sa}$  ranges from 0.81 to 0.88, and  $htc$  ranges from 0.84 to 0.86) and strong to very strong definitional distinctiveness ( $c_{sv}$  ranges from 0.68 to 0.80, and  $htd$  ranges from 0.48 to 0.51).

**Phase 3: Convergent and Discriminant Validities.** We used correlational and experimental approaches to assess convergent and discriminant validities. In the correlational approach (Appendix D in SM), we checked the correlation between our measure and the third-party-rated measure by Petrenko et al. (2019) and the TMT-rated measures by Ou et al. (2014). We merged the sample of Petrenko et al. (2019) with our sample of CEOs from Fortune 500 firms and calculated ECC-based humility indicators for CEOs in listed companies identified in Ou et al. (2014). Our measure significantly correlated with Petrenko et al. ( $r = .16, p = .002$ ) and Ou et al. ( $r = 0.47, p = .020$ ), supporting convergent validity (Samples 4 and 5). In addition, we matched our measure with existing measures of narcissism (Tang et al. 2018), Big Five personality traits (Harrison et al. 2019), submissiveness, and provocativeness (Hill et al. 2019), promotion focus and prevention focus (Qian et al. 2023), and future orientation (Desjardine and Shi 2021) (Sample 6- Sample 10). Supporting its discriminant validity, our CEO humility measure only weakly correlated with these measures, ranging from -0.13 to 0.14.

We acknowledge that there might be weak correlations or discrepancies between our behavioral measure and other perception-based trait measures. To address the limitation of the correlational approach (Krause 2012), we used two experiments (MacKenzie et al. 2011) to seek *causal evidence* of convergent

and discriminant validities. The approach assesses whether indicator variations cause corresponding variations in humility and predicted outcomes. We manipulated volubility-based humility indicators and tested participants' willingness to provide information (CSIR concerns and constructive suggestions) to the CEO. The first experiment of 85 participants used vignettes to manipulate volubility (Sample 11; Appendix E1 in SM). Supporting convergent validity, the manipulation of low versus high humility caused statistically significant differences in participant-rated measures of humility from Owens et al. (2013) and Petrenko et al. (2019). In addition, both ANOVA and regression analysis (Tables S5 and S6 in SM) showed that the manipulation of humility caused participants to be more willing to provide information to more humble CEOs. The second experiment of 265 participants directly manipulated volubility on ECC transcripts and replicated the findings even after controlling for other CEO attributes such as dominance, narcissism, provocativeness, submissiveness, extraversion, introversion, boredom, and competence (Sample 12; Appendix E2, Tables S5 and S6 in SM), further supporting convergent and discriminant validities of our measure.

**Phase 4: Scalability and Predictive Validity.** We demonstrated the scalability of our measure and tested its predictive validity in a larger sample of S&P 1500 firms from 2011 to 2019 (Sample 13) using 40,921 quarterly ECC transcripts. After excluding CEOs who stayed in office for less than two years, Sample 13 covered 1,639 CEOs, 1,499 firms, and 5,586 firm-years. We examined the predictive validity of the measure by regressing it with pre-validated strategic decision outcomes, TMT vertical pay parity, and ambidextrous orientation (Ou et al. 2018). Consistent with Ou et al. (2018), our measure of humility is negatively associated with TMT vertical pay disparity ( $\beta = -0.135, p = .000$ ) and positively associated with ambidextrous orientation ( $\beta = 3.085, p = .000$ ). Our measure exhibited stronger associations with the outcomes than the measure of Petrenko et al. (2019) and remained significant after controlling for CEO big five personalities (Appendix F in SM).

#### **Dependent Variables: Corporate Social Irresponsibility Occurrence and Corrective Actions**

***Corporate Social Irresponsibility Occurrence (CSIR).*** To identify the occurrence time of specific CSIR incidents, observe firms' corrective actions, and match them with corresponding CEOs, we

manually searched CSIR incidents from media reports (Hawn 2021, Liu et al. 2022) instead of using ratings such as KLD. Based on Mishina et al. (2010) and Godfrey et al. (2009), we operationalized CSIR as legal or regulatory violations resulting in conviction or settlement. Examples include pollution, accounting misstatements, unsafe products, employment discrimination, and contract violation.

We collected an initial pool of CSIR incidents from three main news outlets, *The Wall Street Journal*, *The New York Times*, and *The Washington Post* (Bednar 2012). We searched Factiva databases for headlines and lead paragraphs that contained combinations of company names and keywords including *scandal*, *violation*, *fraud*, *fine*, *penalty*, *illegality*, *suit*, *lawsuit*, *crime*, and *guilt*. Among the 1,011 identified articles, two coders manually checked whether these articles were related to firms in our sample and determined actual CSIR occurrences by checking whether the legal or regulatory actions resulted in conviction or settlement. For each incident, they recorded the year(s) it occurred. The coders discussed and resolved discrepancies or consulted with the research team for final judgments (Cohen's  $\kappa = .841$ ). Consistent with our sample construction, we identified 70 CSIR incidents that *occurred* in the third or any subsequent year of a CEO's tenure to ensure the incident fell under the focal CEO's influence. Finally, we coded *CSIR occurrence* (for H1, H3a, and H4a) as a dummy variable that equals one if the firm has any CSIR incident in a year (year  $t$ ), and zero otherwise. We also checked the robustness of our results using a count variable of CSIR incidents.

***Post-CSIR Corrective actions.*** To test H2, H3b, and H4b, we identified corrective actions of the CSIR incidents reported under the focal CEO's tenure. This is because CEOs are expected to take corrective actions after a CSIR incident is reported regardless of their direct responsibility for the occurrence (Pfarrer et al. 2008). Note that the CSIR incident and post-CSIR corrective actions do not have to occur under the same CEO's tenure. For example, *The Wall Street Journal* was the first to *report* an age discrimination lawsuit against 3M in 2008 when George Buckley was CEO who started the position in December 2005, but the discrimination occurred in 2003 when James McNerney was CEO. For this incident, we tested the association between James McNerney's humility score and CSIR occurrence (H1) and the association between George Buckley's humility score and post-CSIR corrective actions (H2).

Consistent with our sample construction procedures, we obtained 140 incidents that we used to examine whether firms took post-CSIR corrective actions. Next, we used press releases from Business Wire and PR Newswire databases to search for firm names in the headlines and the sources to identify corrective actions. We used content categories marked by Factiva database's "intelligent indexing" (Bednar 2012) to generate an initial list of 164 corrective actions for further screening. Actions included *process redesign*, *supply chain management*, *auditor*, *worker pay*, *workplace safety*, *welfare*, and *employee training/development* categories. We employed the same procedure used for identifying CSIR occurrence. Two trained coders verified 51 corrective actions (Cohen's kappa = .839). As firms may decouple action announcements from actual actions (Westphal and Zajac 2013), we verified whether the press releases captured actual actions by confirming the ones written in past, present continuous, or present tense, and by searching for additional evidence from other sources for press releases using future tense. In addition, we excluded verbal accounts such as apologies and executive replacements because past research suggests that such actions could be symbolic measures to appease the public (Gangloff et al. 2016, Suchman 1995). We measured *Post-CSIR corrective actions* as the number of corrective actions within six months following the first news report of the incident.

### **Moderators: High-CSIR industry and Minority TMT Members**

***High-CSIR industry.*** We measured *High-CSIR industry* (i.e., industry with a high number of CSIR incidents) as one if the total number of industry peer CSIR incidents is above the median level, and zero otherwise. Industry peer CSIR incidents refer to CSIR incidents reported in the past three years in a given (two-digit) industry excluding the focal firms.<sup>1</sup> Examples of industries categorized as high-CSIR industries include Chemical & Applied products (SIC2=28), Transportation equipment (SIC2=37), and Business service (SIC2=73).

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<sup>1</sup> Results are consistent if we use alternative measures of high-CSIR industry, specifically when we (1) include CSIR in focal firms while calculating *high-CSIR industry*; (2) use time-invariant industry-level measure; (3) use the 75th percentile as a cutoff instead of median; or (4) use the number of media reports instead of number of incidents reported to calculate the measure.

**TMT minority ratio.** We collected top managers' information from Execucomp. We inferred race using the algorithm developed by Sood and Laohaprapanon (2018), a commonly used machine-learning-based classifier that uses both first and last names to predict race (He et al. 2022, Rivera and Tilcsik 2023). TMT minority ratio (i.e., ratio of female and racial minority members in TMT) is measured as the number of female and non-white members divided by the total number of members, excluding CEOs.

### **Control variables**

For H1, H3a, and H4a, we controlled for several CEO-, firm-, and industry-level factors. At the CEO level, we controlled for *CEO tenure* (number of years since appointed as CEO) and *Female CEO* (1 = yes, 0 = no) because research shows that CSIR is more likely to occur under CEOs with short tenure and who are male (Schnatterly et al. 2018). We also controlled for the CEO's finance-related experience (*CEO financial background*, 1 = yes; 0 = no), which could affect participation in ECCs. We collected CEO demographics from Execucomp and BoardEx. As status may motivate unethical behaviors, we control for CEO status (Graffin et al. 2013, Piff et al. 2012, Sauder et al. 2012). Specifically, we included the *number of CEO awards* granted by Businessweek, Financial World Gold/Silver awards, Forbes, Chief executives, and Harvard Business Review (Shi et al. 2016).

At the firm level, we controlled for age, size, performance, and advertising expenses, collected from Compustat. Older and larger firms have higher operational complexity and thus a higher risk of irresponsibility (Strike et al. 2006). They also are more resistant to change (Hannan and Freeman 1984), including taking corrective actions after CSIR. We measured *firm age* as the number of years since incorporation, and *firm size* as the logarithm of firm assets. Firm profitability, which might drive CSIR (Mishina et al. 2010), was measured as return on equity (*ROE*) minus industry level ROE (sic2). We controlled *advertising expenses (ln)*, the natural logarithm of advertising expenses, which increases firm visibility and attracts more media attention, making CSIR behaviors more likely to be reported (Westphal and Zajac 1998). To rule out firm performance pressure as a confounding factor (Gonsalves 2023), we measured whether firms miss their earnings target in a given year. Based on data obtained from I/B/E/S



database, we coded *miss earnings target* as one if the actual earnings per share is lower than the average earnings forecast, and zero otherwise.

We also controlled for indicators of corporate governance and analyst coverage, because closely monitored firms are less likely to engage in CSIR and more likely to take post-CSIR actions (Greve et al. 2010). Corporate governance indicators included *CEO duality* (i.e. CEO serves as board chair at the same time), *independent director ratio*, and *institutional ownership* (Mishina et al. 2010). Analyst coverage was the number of analysts issuing earnings forecasts (Tang et al. 2015). We also controlled for previous CSIR, which was the number of CSIR incidents reported in the media in the previous three years (Tang et al. 2015).

At the industry level, we controlled the potential influence of industry munificence and dynamism on CSIR tendencies (Li and Tang 2010, Mishina et al. 2010). *Industry munificence* was calculated as average growth in (two-digit SIC) industry sales over the previous five years (Li and Tang 2010). *Industry dynamism* was measured by the standard error of the regression slope for industry sales over the previous five years divided by the mean of industry sales over the same period (Li and Tang 2010). Finally, we included industry and year dummies to control systematic, contextual differences in CSIR.

For H2, H3b, and H4b, we added three controls at the incident level. We controlled for whether CSIR incidents happened during or before the focal CEO's term (*CSIR timing*, 1 = during term, 0 = before term), because timing may affect the CEO's sense of responsibility. We also controlled CSIR severity because severe incidents are more likely to motivate action (Desai 2011). *CSIR severity* was measured as cumulative abnormal return (CAR), a widely adopted measure to capture the stock market's response to an event (Flammer 2015). We used one trading day before and after the first news report of the CSIR incident [t-1, t+1] to create a three-day event window, and used a time window of 200 trading days from 45 days prior to the CSIR behavior as the "normal" period (Boehmer et al. 2002, Flammer 2015). To control for the likelihood of releasing information, we included the firm's *number of previous press releases*, measured as the number of press releases in the past six months.

## **Model and estimation**

We used logit regression in our main analyses to test H1, H3a, and H4a because the dependent variable is dichotomous. We clustered standard errors at the firm level to address serial correlation within firms and potential heteroskedasticity (White 1980). We checked potential multicollinearity in our models and found it an unlikely concern because the highest variance inflation factor was 1.97. We also checked the robustness of the result using alternative measures and models, discussed in the results section.

The tests of H2, H3b, and H4b concerning post-CSIR corrective actions included only firms with CSIR incidents reported by the media and thus may have potential sample selection bias. To address this concern, we used the Heckman two-stage selection model (Heckman 1979). Following the suggestions from Certo et al. (2016), in the first stage of the probit modeling, we included the control variables in H1, the independent variable *CEO humility*, and *newspaper coverage*, the logged number of firm-related newspaper articles from the 25 largest U.S. daily newspapers by circulation in the past three years as the “exclusion restriction”, which was positively related to the likelihood that major newspapers reported the event but was not related to the specific actions taken. We used an ordinary least squared (OLS) regression in the second stage and included the Inverse Mills Ratio (IMR) generated from the first-stage model. We controlled industry- and year-fixed effects to account for industry time-invariant and macroeconomic characteristics.

## RESULTS

Tables 2 and 3 show descriptive statistics for the variables included in our models. We present our results with *CSIR* as the dependent variable in Table 4. Model 1 includes only control variables, Model 2 adds the main effect of CEO humility, Model 3 (Model 4) adds the interaction term of CEO humility and *High-CSIR industry (TMT minority ratio)*, and Model 5 includes both interactions.

----- Insert Tables 2, 3, and 4 about here -----

H1 posits that CEO humility is negatively associated with CSIR occurrence. The coefficient of CEO humility is negative and significant in Model 2 ( $\beta = -0.630, p = .004$ ). When holding other variables at their means, the probability of CSIR occurrence drops by 59.74% as CEO humility increases from one standard deviation (SD) below the mean to one SD above the mean. In Model 5, the coefficient of CEO

humility is negative and marginally significant ( $\beta = -0.446, p = .073$ ). We visualize the nonlinear marginal effects of CEO humility (Hoetker 2007, Wiersema and Bowen 2009) in both models in Figure S1, Appendix G, which generally support H1.<sup>2</sup>

In addition, we checked the robustness of the association between CEO humility and CSIR in several ways and summarized the results in Panel A, Table S8 in SM. First, while most firms have zero or one CSIR incident, a few firms have more than one CSIR incident in a given year. Hence, we used the number of CSIR incidents (a count variable) as a dependent variable and a Poisson model as a robustness check. The main result remains consistent (Model 1:  $\beta = -0.579, p = .000$ ). Second, the result is consistent using a linear probability model (LPM; Model 2:  $\beta = -0.016, p = .033$ ) as an alternative estimation approach. Third, we used the rating of CSR concern from KLD (a continuous variable) as an alternative measure of CSIR (Strike et al. 2006, Tang et al. 2015). The OLS result consistently shows a negative association between CEO humility and CSR concerns (Model 3:  $\beta = -0.041, p = .059$ ).

H3a suggests that high-CSIR industry strengthens the negative association between CEO humility and CSIR occurrence. Supporting H3a, Table 4 shows that the interactions between CEO humility and high-CSIR industry are negative and significant (Model 3:  $\beta = -0.972, p = .007$ ; Model 5:  $\beta = -0.858, p = .022$ ). Holding other variables at mean, when a firm operates in high-CSIR industry, the probability of CSIR drops by 73.64% when CEO humility changes from one SD below mean to one SD above mean, while the probability of CSIR occurrence only drops for 5.39% in low CSIR industry. Similarly, Figure

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<sup>2</sup> Panel A of Figure S1 (Appendix G) shows the association of CEO humility and the predicted probabilities of CSIR based on Models 2 and 5. In both lines, the predicted probabilities of CSIR decline as CEO humility increases. Panel B of Figure S1 (Appendix G) shows the average marginal effects of CEO humility across all values of CEO humility. In Model 2, the marginal effect of CEO humility is negative and significant ( $p < 0.05$ ) when CEO humility exceeds -1.5. In Model 5, the marginal effect is marginally significant ( $p < 0.1$ ) when CEO humility ranges from -1 to 1.5. Yet, the isolated coefficient of CEO humility in Model 5 should be interpreted with caution. To interpret the main effect in the full models when moderating variables are present, we followed a marginal effect approach recommended by recent studies (Busenbark et al. 2022, Han et al. 2024). When interaction terms are present, the coefficient of CEO humility depends on the values of the moderators. The coefficient of the independent variable (i.e., *CEO humility*) in isolation in the full model *only* shows its influence *when* moderators equal zero (Busenbark et al. 2022, p. 150–151, Wooldridge 2012, p. 198–199). For instance, the isolated coefficient of CEO humility in Model 5 of Table 4 shows its association with the probability of CSIR when high-CSIR industry and TMT minority ratio equal zero. Thus, instead of interpreting the isolated main effects in the full models, we interpret *when* H1 and H2 are supported. That is, we estimated and visualized the average marginal effects of CEO humility based on full models, which vary across different values of the moderators, i.e., high- vs. low-CSIR industry and different levels of TMT minority ratio.

S2 in Appendix G shows that the marginal effect of CEO humility on CSIR is negative only when firms are in high-CSIR industries.<sup>3</sup>

H4a suggests that TMT minority ratio strengthens the negative association between CEO humility and CSIR occurrence. Table 4 shows that the coefficients of the interaction between CEO humility and TMT minority ratio are negative but not significant (Model 4:  $\beta = -0.105$ ,  $p = .911$ ; Model 5:  $\beta = -0.183$ ,  $p = .846$ ). Holding other variables at mean, the probability of CSIR drops by 45.45% when CEO humility changes from one SD below mean to one SD above mean in firms with low TMT minority ratio, and the probability of CSIR occurrence drops for 50.84% in firms with high TMT minority ratio. Similarly, Figure S3, Appendix G shows that the associations between CEO humility and CSIR appear to be similar when firms have high or low TMT minority ratio, failing to support H4a.<sup>4</sup>

Table 5 reports the results with post-CSIR corrective actions as the dependent variable. First, Model 1 estimates the first stage probit regression in the Heckman model that predicts the likelihood of CSIR being reported. In other models, we controlled selection bias by including Inverse Mill's Ratio (IMR) generated in Model 1. Model 2 includes all control variables and the IMR. Model 3 adds CEO humility to the regression, Models 4 and 5 separately add the two moderators and their interactions with *CEO humility*, and model 6 includes both interactions.

----- Insert Table 5 about here -----

In H2, we argue that CEO humility is positively associated with post-CSIR corrective actions. CEO humility is significantly and positively related to corrective actions in Model 3 ( $\beta = 0.175$ ,  $p = .047$ ). In terms of economic significance, one SD increase of CEO humility is associated with an increase of

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<sup>3</sup> Panel A of Figure S2 plots shows the association between CEO humility and CSIR in low- and high-CSIR industries. In line with H3a, the association between CEO humility and CSIR is negative when firms operate in high-CSIR industries, as shown in the blue line with a steeper slope, while the effect becomes weaker when firms operate in low-CSIR industries, as represented in the red line with a flatter slope. The differences between the two slopes are statistically significant when CEO humility is between 0.3 and 1.6. Panel B shows how the average marginal effect of CEO humility on CSIR varies by high- vs. low-CSIR industries. The average marginal effect of CEO humility is only significant in high-CSIR industry.

<sup>4</sup> Panel A of Figure S3, Appendix G shows the association between CEO humility and the predicted CSIR when firms have high or low TMT minority. We find that the negative association of CEO humility on CSIR occurrence in high TMT minority firms, as shown in the blue line, is not different from that in low TMT minority firms, as represented in the red line. Panel B of Figure S3, Appendix G plots the average marginal effect of CEO humility on CSIR across different values of TMT minority ratio. We find that the average marginal effect of CEO humility is significant when TMT minority ratio is in the middle range between 0.2 to 0.45.

0.135 in corrective actions, or a 45% increase compared to the average number of corrective actions (0.30). Similar to H1, in the full model (Model 6), we interpret the main results following the marginal effect approach. Specifically, H2 is supported when firms are in a high-CSIR industry (Panels B in Figure S4, Appendix G). The positive association between CEO humility and corrective actions becomes significant when firms are in a high-CSIR industry and marginally significant ( $p < 0.1$ ) when firms have a minority ratio larger than 0.25 (Panels B in Figures S4 and S5, Appendix G). In addition, the association between CEO humility and corrective actions remains robust when we used a Poisson model with the number of corrective actions as the dependent variable ( $\beta = 0.906, p = .002$ ; Model 1, Panel A, Table S9 in SM) and a logit model with whether firms take corrective actions as the dependent variable ( $\beta = 1.655, p = .033$ ; Model 2, Panel A, Table S9 in SM).

H3b and H4b suggest that the two moderators strengthen the positive association between CEO humility and corrective actions. As shown in Table 5, the interaction between CEO humility and high-CSIR industry is positive and significant (Model 4:  $\beta = 0.508, p = .006$ ; Model 6:  $\beta = 0.426, p = .033$ ). Based on Model 6, when firms operate in high-CSIR industries, one SD increase in CEO humility is associated with a 0.206 increase in corrective actions (68.67% increase compared to average number of corrective actions), but a 0.121 drop in a low-CSIR industry (40.33% drop). In the test of H4b, the interaction between CEO humility and TMT minority ratio is positive and significant in Model 5 ( $\beta = 1.572, p = .031$ ), supporting H4b. When including both moderators in model 6, the interaction between CEO humility and TMT minority ratio is positive and marginally significant; ( $\beta = 1.243, p = .098$ ). For firms with a higher TMT minority ratio, one SD increase of CEO humility is associated with an increase of 0.226 in correction actions (a 75.33% increase compared to the average number of corrective actions), while for firms with a lower TMT minority ratio, there is a decrease of -0.109 in correction actions (36.33% drop). Figures S4 and S5 in Appendix G show similar insights: the association between CEO humility and CSIR correction is more positive in a high-CSIR industry and firms with a higher TMT minority ratio.

### **Additional Analyses**

As detailed in Appendix H in SM, we conducted additional analysis to address potential concerns associated with this study. First, an endogeneity concern is the nonrandom assignment of humble CEOs, as they may self-select or be selected by certain types of firms. To address this concern, we used the coarsened exact matching (CEM) approach (Iacus et al. 2012) and found consistent results. Second, we addressed the potential sample selection bias introduced when we omitted CEOs who did not attend or speak up during ECCs using a Heckman probit model (Van De Ven and Van Praag 1981). Third, we addressed the concern that public media may selectively attend to certain firms when reporting CSIR. Fourth, we tested whether CEO humility explains CSIR after controlling for other CEO attributes, such as narcissism, the Big Five personality traits, regulatory focus, future orientation, age, ownership, overconfidence, overpay, and whether CEOs started their career at prosperous times. Lastly, ITCV (impact threshold of a confounding variable) analysis showed that it is unlikely that omitted variables would invalidate our findings.

## **DISCUSSION**

Our study shows that firms led by humble CEOs have a lower likelihood of CSIR occurrence, especially in high-CSIR industries characterized by a substantial number of CSIR incidents. In addition, when CSIR incidents occur and are publicized, humble CEOs are more likely to take corrective actions, particularly in high-CSIR industries and in TMTs with a higher ratio of female and racial minorities.

This study makes several contributions. First, our study contributes to management research with a more complete understanding of CEOs' role in CSIR prevention and correction. Rather than studying CSIR-prone CEO attributes, we introduce humility as a distinctive CSIR-averse attribute that motivates CEOs to protect stakeholder interests and employ systematic information processing. Our study extends the current CSIR research by demonstrating that humble CEOs can reduce CSIR occurrence. This is a departure from studies that paint a pessimistic picture of how CEOs are susceptible to committing CSIR due to institutional pressures, insufficient governance, or bias-prone psychological attributes (Greve et al. 2010, Schnatterly et al. 2018). Instead, we align with researchers who emphasize the possibilities and responsibilities of human agency for making ethical decisions (Bandura 2016, Ellertson et al. 2016).

Similarly, we echo Jia et al. (2021) to propose a novel direction for upper echelons research, focusing on attributes that mitigate rather than reflect bounded rationality. Future research can explore other promising attributes such as conscientiousness or openness to experience (Harrison et al. 2019).

Importantly, through our pioneering study that relates CEO humility to corrective actions, we draw attention to the crucial role of CEOs in addressing the aftermath of CSIR incidents. In doing so, we enrich the research on misconduct, wrongdoing, and behavioral ethics that predominantly focuses on the antecedents of unethical behaviors while overlooking their correction (Hersel et al. 2019). Additionally, our research expands the literatures on crisis management (Bundy et al. 2017) and trust, legitimacy, and reputation repair (Lewicki and Brinsfield 2017, Pfarrer et al. 2008, Suchman 1995). While these literatures categorize post-CSIR responses and identify contextual factors that influence their effectiveness, we introduce the upper echelons perspective that demonstrates the significance of CEO attributes as key antecedents of crisis management or trust repair strategies.

Second, our study contributes to CEO humility research by extending the outcomes of CEO humility to include stakeholder-centered ones such as CSIR prevention and correction. In doing so, we clarified the ambivalent discussion on the ethical implications of humility, responded to the call for integrating upper echelons and stakeholder governance literatures, and provided evidence that humble CEOs indeed are more likely to improve firm performance on stakeholder-related dimensions (Wiersema and Koo 2022). In addition, by identifying high-CSIR industries and the ratio of female and racial minority members in the TMTs as moderators, our study enhances the understanding of the mechanisms underlying the effectiveness of humble CEOs as guardians against CSIR. Interestingly, the ratio of female and racial minority members did not strengthen the association between CEO humility and CSIR prevention, although it did contribute to enhancing the association between CEO humility and corrective actions. This suggests that the influence of minority members becomes more pronounced during times of crisis when CSIR is publicized.

Third, we contribute empirically to the upper echelons research by developing and validating a new unobtrusive measure of CEO humility using automated, objective behavioral indicators. Our measure

overcomes limitations such as low reliability and scalability in some of the previous measures (e.g., Beauchesne 2014, Maldonado 2015; Ou et al. 2014), and it is a valuable extension and complement to the perception-based unobtrusive measure. Specifically, Petrenko et al.'s (2019) measure is based on uninformed observer ratings and is suitable for studying the implication of CEO humility on stakeholder perceptions (Recendes et al. 2023). By comparison, our measure minimizes observer misinterpretation and CEO manipulation, offers time-sensitive humility ratings, is easy to scale and replicate, and is an effective tool for examining the association between CEO inner humility and firm actions. As shown in our validation study, we compared the predictive power of Petrenko et al.'s measure with our measure and found that our measure exhibited stronger prediction for pre-validated firm action outcomes. These differences serve as a guide for subsequent research in selecting among related measures.

### **Limitations and Future Research Directions**

Nevertheless, our study has limitations that call for future research. First, our humility measure, derived from volubility indicators, is an indirect and partial proxy of a complex executive attribute. Unobtrusive indicators are intended to reflect a superordinate construct and cannot directly and precisely map onto separate dimensions (Chatterjee and Hambrick 2007, Chin et al. 2013). Similarly, our measure captures two fundamental dimensions of humility rather than covering the full conceptual domain (Mcelroy-Heltzel et al. 2019, Van Tongeren et al. 2023). Still, our multimethod, multisample validation procedures offer extensive support for measurement validity and reliability, and allow researchers to treat humility as an evolving rather than a fixed attribute, in closer alignment with contemporary understanding of psychological attributes (Tasselli et al. 2018). We acknowledge the presence of weak correlations or discrepancies between our measures, which are based on objective behaviors, and some CEO attribute measures derived from perceptions of uninformed observers. To address this concern, we have conducted two additional experiments and provided compelling causal evidence to further support the convergent and discriminant validities of our measure. Future studies could investigate the different organizational implications of CEOs' internal versus expressive humility by leveraging behavioral and perceptual-based measures of humility. As our measure cannot directly capture whether the CEO is genuinely listening to



or appreciating others, future research can utilize big data and artificial intelligence to analyze more textual, audio, and video data on TMT members' comments about whether CEOs solicit or endorse their voices (Harrison et al. 2023; Luo et al. 2024). Corroboration of evidence from multiple sources of data can provide more reliable indicators of CEOs' genuine appreciation of others.

Second, we studied a simple relationship between CEO attributes and the occurrence and correction of legal or regulatory irresponsibility. We only covered a narrowly defined, specific subset of CSIR, as they are the unequivocal form of CSIR that both advocates for shareholder interests and advocates for stakeholder interests condemn (Campbell 2007, Friedman 2020). Given society's increasing expectations for firms to move beyond simply fulfilling their legal responsibilities and proactively embrace sustainable practices, we encourage researchers to explore the effects of CEOs on a broader range of CSIR, including legal yet unsustainable business practices that may deplete natural resources or contribute to climate disasters (Roemer et al. 2023). Considering the multifaceted nature of CSIR, we also encourage researchers to examine how CEOs navigate trade-offs between the interests of primary and secondary stakeholder groups (Clarkson 1995). As more companies are incorporating environmental, social, and governance (ESG) metrics in executive compensation, it is interesting to see how CEO attributes interact with financial incentives (or lack thereof) to influence ESG performance (Cohen et al. 2023). Exploring these complexities can provide a deeper understanding of CEO effects on CSIR.

Third, our theory on how humble CEOs make decisions, along with our newly developed measure, establishes a solid foundation for more sophisticated investigations into the effect of CEO humility. Future research could advance the agenda by exploring questions such as: Are humble CEOs risk-averse (Chatterjee and Hambrick 2007), or are they more inclined to take calculated risks for prosocial initiatives driven by their concern for stakeholder interests? Are humble CEOs more likely to receive and yield to performance pressures when facing the trade-off between the interests of primary and secondary stakeholder groups? Would humble CEOs have different short-term and long-term implications for firm financial performance (Ou et al. 2018)? We believe that answering these related questions helps build a comprehensive understanding of CEO humility.

## Conclusion

More than ever, the world is calling for responsible leaders to safeguard stakeholder interests. However, CEOs often fail to do so, because they sometimes are like “emperors in new clothes,” unaware of their own preferences and biases, and insulated from hard truths and wise counsels (Gregersen 2017). Our study suggests that humble CEOs, who prefer protecting stakeholder interests and employing systematic information processing, are better guardians against CSIR and take more corrective actions after CSIR. We hope that academics and practitioners can work together to identify and train more humble CEOs, design corporate governance practices that can align CEO incentives with stakeholder interest protection, and create socially responsible organizations for a better society.

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**Table 1. Overview of the Scale Development and Validation Procedures of CEO Humility**

Phase	Summary	Appendix and Sample
<b>Phase 1: Indicator development and refinement</b>	Based on expert ratings, item-total correlation (ITC) analysis, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and reliability analysis, we identified four indicators calculated from quarterly earnings conference calls (ECCs) from an extensive list of 25 indicators deductively generated from the management definition of humility.	Appendices A, B; Samples 1, 2.
<b>Phase 2: Content validity</b>	Theoretically, the indicators effectively capture both the intrapersonal and interpersonal dimensions of the definition of CEO humility, i.e., tendency to recognize self-limitations and appreciate others.  Empirically, content validity is supported by subject expert agreement as well as assessments by Anderson and Gerbing's and Hinkin and Tracey's approaches. These assessments supported definitional correspondence and definitional distinctiveness against relevant constructs like dominance, narcissism, provocativeness, extraversion, and boredom.	Appendix C; Samples 1, 3.
<b>Phase 3: Convergent and discriminant validities</b>	<i>Convergent validity:</i> Our humility measure is positively correlated with those of Petrenko et al. (2019) and Ou et al. (2014). Two experiments show that our measure converges with humility measures from Owens et al. (2013) and Petrenko et al. (2019).  <i>Discriminant validity:</i> Our humility measure has a weak correlation with other commonly used CEO attribute measures: narcissism, the Big Five personality traits, provocativeness, submissiveness, regulatory focus, and future orientation. Two experiments show that our measure relates to CEO humility after controlling for dominance, narcissism, provocativeness, submissiveness, extraversion, introversion, boredom, and competence.	Appendices D and E; Samples 4 to 12
<b>Phase 4: Predictive validity and scalability</b>	We expanded the measure to S&P 1500 firms using earnings conference call (ECC) transcripts. CEO humility is significantly associated with two pre-verified decision outcomes in Ou et al. (2018): TMT vertical pay disparity and ambidextrous orientation.	Appendix F; Sample 13.
Sample Description		N
<b>Sample 1: Academic experts</b>	All are active upper echelons researchers. Six have experience validating and publishing CEO trait measures, and seven have experience using these measures in their publications. They have published in <i>Administrative Science Quarterly</i> , <i>Academy of Management Journal</i> , and <i>Strategic Management Journal</i> .	13
<b>Sample 2: Fortune 500 CEOs in selective industries</b>	CEOs of Fortune 500 companies in the computer software, hardware, and information technology industries from 2002 to 2011.	357
<b>Sample 3: Qualtrics panel</b>	U.S. employees with at least 10 years of working experience.	77
<b>Sample 4: Petrenko et al. (2019), humility dataset</b>	CEOs of S&P 500 companies from 2000 to 2013.	369
<b>Sample 5: Ou et al. (2014) humility dataset</b>	CEOs of private firms in China. We found that six firms became public and obtained 24 yearly ECC transcripts matched with the CEOs in Ou et al. (2014).	24
<b>Sample 6: Tang et al. (2018) narcissism dataset</b>	The original dataset included 266 CEOs from 235 S&P 1500 firms from 2003 to 2010; the authors later updated the dataset to year 2012.	462
<b>Sample 7: Harrison et al. (2019) Big Five personalities dataset</b>	CEOs of S&P 1500 firms from 1996 to 2014.	1,179
<b>Sample 8: Hill et al. (2019) provocativeness and submissiveness dataset</b>	CEOs of Fortune 500 firms from 2000 to 2016.	128
<b>Sample 9: Qian et al. (2023) regulatory focus dataset</b>	CEOs of S&P 500 firms between 2002 to 2011.	656
<b>Sample 10: DesJardine and Shi (2021) future orientation dataset</b>	CEOs of US public firms between 2003 to 2016.	1,010
<b>Sample 11: Qualtrics panel (for Experiment 1)</b>	U.S. employees with at least 10 years of working experience.	85
<b>Sample 12: Prolific panel (for Experiment 2)</b>	US employees aged above 30, with leadership / position of power / supervisory duties and management experience.	265
<b>Sample 13: S&amp;P 1500 CEOs (ECC transcripts)</b>	CEOs of S&P 1500 firms from 2011 to 2019.	5,586

**Table 2. Descriptive Statistics and Correlations for H1, H3a, and H4a (N = 1,243 firm-years)**

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. CSIR	.05	.21																			
2. CEO humility	.05	.74	.00																		
3. High-CSIR industry	.47	.50	.03	.09																	
4. TMT minority ratio	.16	.20	.04	-.08	-.06																
5. CEO tenure	4.93	2.63	-.02	-.03	-.17	.06															
6. Female CEO	.04	.20	-.03	-.08	-.07	.05	-.08														
7. CEO financial background	.28	.45	.01	.06	-.14	.01	.02	.10													
8. Number of CEO awards	.02	.13	.00	-.05	-.07	.03	.06	.45	.07												
9. Firm age	44.70	18.24	-.01	.07	-.09	.04	.06	.13	.03	.10											
10. Firm size	9.77	1.10	.19	.20	-.15	.02	.09	.09	.16	.11	.32										
11. ROE	.12	.75	-.02	-.05	.07	-.01	-.02	-.03	.00	.01	.04	-.01									
12. Advertising expenses (ln)	1.63	2.79	.18	.00	.10	-.03	-.05	.03	-.13	.09	.07	.14	.01								
13. Miss earning target	.33	.47	-.03	-.02	-.01	-.05	.01	-.08	.00	-.04	-.03	-.01	-.01	-.02							
14. CEO duality	.72	.45	.01	.12	-.03	-.06	.09	-.02	.12	-.03	.18	.12	-.00	-.04	-.04						
15. Independent director ratio	.82	.10	-.03	-.02	-.19	.06	.19	.02	.03	.02	.32	.13	.05	.07	.01	.11					
16. Institutional ownership	.75	.17	-.09	-.16	-.01	-.01	.12	-.26	-.09	-.14	-.26	-.27	-.02	-.08	.05	-.04	.06				
17. Analyst coverage	19.50	8.68	.17	.13	.02	-.03	.10	-.09	.12	.00	-.16	.37	.04	.16	.00	.10	-.07	-.02			
18. Previous CSIR profile	.24	.69	.26	.02	.11	.04	-.09	.02	-.05	.00	.03	.26	.04	.25	-.06	-.03	-.02	-.08	.21		
19. Industry munificence	.04	.04	-.01	-.02	.12	-.04	-.11	-.08	-.02	.00	-.18	-.15	.04	-.10	-.10	-.01	-.13	.11	.02	.05	
20. Industry dynamism	.01	.01	.02	-.01	-.09	-.04	-.02	.03	.06	-.02	.01	.02	-.05	.02	.01	-.01	.02	-.02	.07	-.03	-.14

Note: coefficients above .07 in absolute value are significant at 0.05 level.

**Table 3. Descriptive Statistics and Correlations for H2, H3b, and H4b (N = 140 firm-years)**

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. Number of corrective actions	.30	.66																						
2. CEO humility	.13	.77	.34																					
3. High-CSIR industry	.53	.50	.04	-.06																				
4. TMT minority ratio	.17	.18	.03	-.20	-.01																			
5. CEO tenure	4.17	2.01	.04	.19	-.05	.06																		
6. Female CEO	.06	.23	-.07	-.38	-.26	.11	-.11																	
7. CEO financial background	.26	.44	.05	.10	.03	.06	-.02	.00																
8. Number of CEO award	.04	.19	-.09	-.03	-.20	-.04	.27	.28	-.11															
9. Firm age	44.49	17.76	.02	-.03	-.24	.02	-.09	.17	.15	.18														
10. Firm size	1.73	1.28	.22	.25	-.20	-.05	.05	-.04	.18	.09	.35													
11. ROE	.16	.45	.05	-.15	.03	.01	.02	-.06	.04	.04	-.06	-.07												
12. Advertising expenses (ln)	3.91	3.92	.07	.03	.25	.01	-.07	-.25	-.05	.06	-.04	.37	-.06											
13. Miss earning target	.26	.44	.00	.16	-.25	-.13	.18	-.15	.06	.15	.13	.15	.07	.09										
14. CEO duality	.61	.49	.19	.15	.12	-.15	.13	-.18	.21	-.24	-.12	-.04	.14	-.09	-.02									
15. Independent director ratio	.80	.09	-.15	-.18	-.10	.07	-.02	.10	.03	-.06	.13	-.04	.11	.02	.16	.18								
16. Institutional ownership	.68	.14	-.31	-.35	-.07	.12	.21	.15	-.03	.00	-.13	-.43	.14	-.30	-.15	.09	.20							
17. Analyst coverage	25.53	1.38	-.04	.08	.21	.06	.03	-.30	-.11	-.15	-.47	.26	.14	.45	.06	.00	.07	-.11						
18. Previous CSIR profile	1.28	1.75	.16	.09	.13	.27	-.17	-.04	.00	-.14	-.10	.33	.09	.51	-.10	-.09	-.24	-.19	.35					
19. Industry munificence	.04	.04	.09	.00	.12	-.03	-.04	-.12	-.22	.19	.07	-.07	.18	.01	-.08	.08	-.13	.02	-.15	-.05				
20. Industry dynamism	.01	.01	-.20	-.18	-.06	-.15	-.12	.04	.15	-.15	.12	-.05	-.17	-.07	-.02	.11	.12	.15	-.12	-.15	-.20			
21. CSIR timing	.28	.45	.15	.13	-.05	.06	.47	-.15	.00	.14	-.24	-.05	.10	-.03	.10	.21	-.01	.01	.11	-.14	-.06	-.05		
22. CSIR severity	.00	.03	-.05	-.02	-.12	-.01	-.02	.08	-.03	.09	-.02	.03	.00	-.01	.17	-.18	.08	.13	.11	-.02	-.08	-.09	-.13	
23. number of previous press releases (ln)	4.33	1.22	.20	.13	-.09	.08	.11	.02	.04	.17	.08	.63	-.01	.36	.04	-.14	-.05	-.19	.41	.36	-.08	-.17	.09	.11

Note: Coefficients above .17 in absolute value are significant at 0.05 level.

**Table 4. CEO Humility and the Likelihood of CSIR Occurrence (H1, H3a and H4a)**

	CSIR(dummy)				
	Logit				
	Model 1	Model 2	Model 3	Model 4	Model5
CEO tenure	0.153 <sup>*</sup> (0.078)	0.174 <sup>*</sup> (0.074)	0.193 <sup>**</sup> (0.074)	0.158 <sup>*</sup> (0.073)	0.177 <sup>*</sup> (0.075)
Female CEO	-1.199 (2.053)	-1.665 (2.098)	-1.558 (1.831)	-1.757 (2.228)	-1.645 (1.914)
CEO financial background	0.048 (0.453)	0.024 (0.492)	0.140 (0.490)	0.047 (0.504)	0.154 (0.504)
Number of CEO awards	0.333 (1.923)	0.565 (2.172)	0.205 (1.752)	0.672 (2.292)	0.297 (1.857)
Firm age	0.002 (0.016)	0.000 (0.016)	-0.000 (0.016)	-0.001 (0.015)	-0.002 (0.016)
Firm size	0.812 <sup>**</sup> (0.281)	0.907 <sup>***</sup> (0.266)	0.884 <sup>***</sup> (0.252)	0.918 <sup>***</sup> (0.258)	0.890 <sup>***</sup> (0.247)
ROE	-0.191 (0.214)	-0.236 (0.205)	-0.231 (0.156)	-0.239 (0.208)	-0.232 (0.159)
Advertisement expenses (ln)	0.105 (0.066)	0.092 (0.064)	0.089 (0.069)	0.083 (0.067)	0.079 (0.072)
Miss earnings target	-0.006 (0.406)	0.050 (0.406)	0.098 (0.395)	0.069 (0.411)	0.117 (0.401)
CEO duality	0.204 (0.486)	0.252 (0.458)	0.278 (0.471)	0.305 (0.465)	0.319 (0.478)
Independent director ratio	1.943 (1.973)	2.009 (1.847)	2.639 (1.822)	1.813 (1.878)	2.440 (1.825)
Institutional ownership	-2.110 (1.358)	-2.436 (1.245)	-2.421 (1.290)	-2.432 (1.299)	-2.405 (1.317)
Analyst coverage	0.047 <sup>†</sup> (0.028)	0.049 <sup>†</sup> (0.028)	0.050 <sup>†</sup> (0.028)	0.049 <sup>†</sup> (0.029)	0.051 <sup>†</sup> (0.029)
Previous CSIR profile	0.318 (0.208)	0.306 (0.189)	0.283 (0.183)	0.285 (0.180)	0.259 (0.179)
Industry munificence	-15.535 <sup>*</sup> (7.414)	-16.615 <sup>*</sup> (7.676)	-16.020 <sup>*</sup> (7.398)	-15.761 <sup>*</sup> (7.143)	-15.319 <sup>*</sup> (6.997)
Industry dynamism	-23.835 (23.617)	-23.498 (23.711)	-17.394 (23.472)	-22.831 (23.371)	-16.322 (23.175)
<b>CEO humility(H1)</b>		<b>-0.630<sup>**</sup></b> <b>(0.221)</b>	<b>-0.502<sup>*</sup></b> <b>(0.215)</b>	<b>-0.550<sup>*</sup></b> <b>(0.249)</b>	<b>-0.446<sup>†</sup></b> <b>(0.248)</b>
High-CSIR industry			-1.067 (0.554)		-1.068 (0.559)
<b>CEO humility × High-CSIR industry (H3a)</b>			<b>-0.972<sup>**</sup></b> <b>(0.363)</b>		<b>-0.858<sup>*</sup></b> <b>(0.376)</b>
TMT minority ratio				1.505 <sup>†</sup> (0.773)	1.282 <sup>†</sup> (0.776)
<b>CEO humility × TMT minority ratio (H4a)</b>				<b>-0.105</b> <b>(0.938)</b>	<b>-0.183</b> <b>(0.941)</b>
Industry dummy	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes
Constant	-8.980 <sup>*</sup> (3.709)	-9.782 <sup>**</sup> (3.749)	-10.350 <sup>**</sup> (3.764)	-9.526 <sup>*</sup> (3.721)	-10.147 <sup>**</sup> (3.753)
Log-likelihood	-155.988	-153.108	-149.904	-151.718	-148.937
Pseudo R <sup>2</sup> /R <sup>2</sup>	0.32	0.33	0.34	0.33	0.35

Notes. Number of observations: 1243 firm-years. <sup>†</sup>  $p < .1$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . Standard errors clustered at the firm level are in parentheses; Control variables were measured at the year t-1.

**Table 5. CEO Humility and Post-CSIR Corrective Actions (H2, H3b and H4b)**

Dependent variable	CSIR reported		Number of corrective actions			
	Heckman first stage		Heckman second stage			
	Probit		OLS			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
CEO tenure	-0.038 (0.027)	0.016 (0.043)	0.006 (0.037)	-0.022 (0.041)	0.009 (0.038)	-0.016 (0.042)
Female CEO	-0.448 (0.373)	0.060 (0.266)	0.255 (0.306)	-0.270 (0.338)	0.284 (0.287)	-0.162 (0.333)
CEO financial background	0.225 (0.149)	-0.206 (0.183)	-0.283 (0.173)	-0.171 (0.173)	-0.284 (0.162)	-0.196 (0.168)
Number of CEO awards	0.168 (0.426)	-1.092*** (0.300)	-1.097*** (0.313)	-1.088*** (0.282)	-1.037*** (0.267)	-1.034*** (0.262)
Firm age	-0.000 (0.004)	-0.015 (0.010)	-0.012 (0.009)	-0.008 (0.008)	-0.014 (0.009)	-0.010 (0.009)
Firm size	0.117 (0.092)	0.137 (0.124)	0.105 (0.122)	0.108 (0.116)	0.122 (0.123)	0.115 (0.117)
ROE	-0.096 (0.085)	0.097* (0.044)	0.127** (0.046)	0.097* (0.046)	0.122** (0.046)	0.095 (0.048)
Advertising expenses (ln)	0.011 (0.023)	0.062* (0.025)	0.070** (0.026)	0.061** (0.023)	0.064* (0.026)	0.058* (0.024)
Miss earnings target	-0.114 (0.125)	-0.024 (0.196)	-0.036 (0.198)	0.113 (0.217)	0.023 (0.206)	0.137 (0.224)
CEO duality	-0.272* (0.139)	0.037 (0.139)	-0.017 (0.118)	-0.062 (0.128)	-0.081 (0.128)	-0.101 (0.136)
Independent director ratio	1.633** (0.623)	1.915 (1.208)	1.618 (1.132)	1.476 (1.120)	1.827 (1.131)	1.691 (1.127)
Institutional ownership	-0.495 (0.407)	-2.267*** (0.586)	-2.001*** (0.534)	-2.135*** (0.546)	-1.620** (0.533)	-1.800** (0.577)
Analyst coverage	0.024* (0.010)	0.004 (0.010)	0.004 (0.009)	0.008 (0.009)	0.005 (0.009)	0.008 (0.009)
Previous CSIR profile	0.236*** (0.058)	0.109 (0.061)	0.092 (0.060)	0.097 (0.061)	0.082 (0.065)	0.088 (0.067)
Industry munificence	-2.175 (2.436)	-2.989 (2.119)	-2.675 (2.059)	-1.285 (2.004)	-3.419 (2.069)	-2.086 (2.153)
Industry dynamism	-15.018* (7.234)	-17.906 (12.279)	-11.766 (12.834)	-11.172 (13.680)	-14.782 (12.442)	-14.209 (13.397)
CSIR timing		0.120 (0.172)	0.144 (0.166)	0.153 (0.160)	0.175 (0.170)	0.177 (0.165)
CSIR severity		0.955 (1.856)	0.572 (1.814)	1.132 (1.699)	1.211 (1.788)	1.512 (1.743)
Number of previous press releases (ln)		0.092 (0.094)	0.103 (0.093)	0.135 (0.090)	0.134 (0.090)	0.152* (0.088)
Newspaper coverage (ln)	0.140** (0.046)					
Inverse Mills ratio (IMR)		0.969* (0.403)	0.895* (0.375)	1.021* (0.422)	0.978* (0.370)	1.039* (0.402)
<b>CEO humility (H2)</b>	<b>-0.048</b> <b>(0.079)</b>		<b>0.175*</b> <b>(0.086)</b>	<b>0.050</b> <b>(0.095)</b>	<b>0.176</b> <b>(0.089)</b>	<b>0.067</b> <b>(0.091)</b>
High-CSIR industry				-0.047 (0.206)		0.001 (0.175)
<b>CEO humility × High-CSIR industry (H3b)</b>				<b>0.508**</b> <b>(0.178)</b>		<b>0.426*</b> <b>(0.196)</b>
TMT minority ratio					0.059 (0.300)	0.016 (0.279)
<b>CEO humility × TMT minority ratio (H4b)</b>					<b>1.572*</b> <b>(0.711)</b>	<b>1.243*</b> <b>(0.741)</b>
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-3.206** (1.185)	-1.809 (2.254)	-1.488 (2.111)	-2.053 (2.293)	-2.299 (2.169)	-2.522 (2.280)
Log-likelihood	-256.523					
Pseudo R <sup>2</sup> / R <sup>2</sup>	0.280	0.519	0.534	0.560	0.555	0.559

Notes. Number of observations: 1,243 for Model 1 and 140 firm-events for Models 2 to 6; <sup>†</sup>  $p < .1$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .00$ ; Standard errors clustered at the firm level are in parentheses. Control variables were measured at the year t-1. Previous press releases were measured within six months before CSIR was disclosed.