TONE AT THE TOP:

THE INFLUENCE OF CEO PERSONAL CHARACTERISTICS

ON CORPORATE FINANCIAL REPORTING AND

ENVIRONMENTAL RESPONSIBILITY

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Thesis submitted to the Adelaide Business School, The University of Adelaide, in fulfilment of the requirement for the degree of Doctoral of Philosophy

June 2019

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Abstract

This thesis examines the impact of personal managerial characteristics on the decision making of chief executives (CEOs) at a corporate level. The research suggests executives' personal philanthropy and educational backgrounds have a potent effect on corporate malfeasance in financial reporting and corporate environmental engagement and performance.

My thesis is comprised of two studies. The first study explores the impact of CEO personal altruism on corporate malfeasance in financial reporting. The results show that firms run by CEOs with altruistic preferences, as captured by their stock donations, are less likely to commit financial fraud and exhibit lower levels of real and accrual-based earnings manipulation. These effects are more pronounced for CEOs who do not backdate when making stock donations and who donate stocks outside the tax season. The results are robust to a battery of endogeneity checks, including examining the effect of CEO turnovers, using difference-in-difference models, and applying an instrumental variable approach. Overall, the results suggest that personal altruism of managers has a disciplining effect on corporate malfeasance in financial reporting.

Subsequently, the next chapter addresses potential measurement error of personal managerial altruism and extends the research of the effect of CEO altruism on the readability of a firm's annual financial report. Similar conclusions are obtained when proxying CEO altruism by five alternative measures other than CEO stock donations. Further, the results also show that financial reports are more comprehendible for firms with altruistic CEOs.

Building on the theories of familiarity and self-efficacy, the second study investigates the relationship between CEO educational background in science and MBA degrees, and corporate environmental responsibility. Using a sample of S&P 1500 firms, this research conducts difference-in-difference analyses utilizing CEO turnovers to highlight the impacts of CEOs backgrounds on corporate environmental ratings and performance. The results show that science-educated CEOs take greater environmental risks rather than refraining from investing in environmental strengths which result in lower overall environmental CSR ratings. Conversely, CEO holdings MBA degrees outperform non-MBA CEOs in overall environmental CSR performance because MBA CEOs are more risk-averse in taking additional environmental risks. The overall findings document that CEO educational background may be a potent predictor of differences in corporate environmental engagement and performance.

Declaration

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Acknowledgements

CHAPTER 1

INTRODUCTION

This thesis examines novel aspects of personal managerial traits and the impact on the decision making of executives at a corporate level in two arenas. The first study investigates whether personal altruism of CEOs implies diminishing corporate malfeasance in financial reporting. Specifically, I examine the effect of CEO altruism, which is captured by CEO personal stock donations, on three levels of corporate malfeasance in financial reporting ranging from most serious (frauds), to intermediate (real activities manipulation), to least serious (discretionary accruals).

Subsequently, I address potential measurement error of CEO altruism by extending the proxy of CEO altruism into five alternative measures other than CEO stock donations. I first investigate other psychological factors reflected in CEO personal philanthropic activities. I then examine the potential for opportunistic intentions when CEOs make stock donations by adopting various unique data sources. I also explore other types of charitable contributions in the form of CEO cash donations to political committees/parties with explicit social purposes. I also extend the first study on various forms of corporate malfeasance in financial reporting by examining the effect of CEO altruism on the readability of firm annual financial reports.

Second, I turn my attention to differences in CEO educational backgrounds and their impact on corporate environmental responsibility. Specifically, I explore how CEO educational background (either science-related education or MBA education) can

influence CEO perceptions and risk-taking behaviours when CEOs formulate corporate environmental policies.

This research is motivated by gaps in the growing literature on how top managers use their personal managerial traits to set organisational tone and to influence corporate decision-making outcomes. Research on this topic was largely limited until upper echelon theory was introduced by Hambrick and Mason (1984). Following the launch of this theory, prior empirical studies show that managerial fixed effects[1] (Bertrand and Schoar, 2003; Fee et al., 2013) have an impact on corporate behaviour and performance. Other empirical studies on this topic take significant steps toward showing the effect of specific personal managerial characteristics rather than managerial fixed effects on corporate policies. Despite the heterogeneity of personal characteristics, these studies are limited to traditional CEO personal traits including CEO overconfidence (Malmendier and Tate, 2005, 2008; Malmendier and Nagel, 2011), CEO optimism (Lin et al., 2005; Campbell et al., 2011; Langabeer and DelliFraine, 2011; Davis et al., 2015; Huang-Meier et al., 2016), CEO cultural background (Pan et al., 2017), political ideology (Chin et al., 2013; Gupta et al., 2017), education (Lewis et al., 2014; Miller et al., 2015; King et al., 2016; Henderson et al., 2018), family composition (Cronqvist and Yu, 2017), CEO expertise (Yermack, 2006; Kaplan et al., 2012; Custódio and Metzger, 2014a; Gounopoulos and Pham, 2018), and CEO personal risk preference (Sunder et al., 2017). Motivated by this literature, the research in this dissertation responds properly to an increased demand for investigating novel aspects of personal managerial traits and idiosyncrasies, and whether they have impact in explaining various corporate policies and decision-making outcomes, on which little previous research has been carried out.

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[1] Managerial fixed effects represent the persistence of managerial style over time and across different jobs.

My research is built on the social psychology and economics literature. Specifically, the first study on CEO altruism and corporate malfeasance in financial reporting. The concept of CEO personal altruism in this study and its extended study rely on both social biology and prosocial behaviour theories which suggest that personal altruism is any prosocial behaviour which increases the welfare of others without considering a direct benefit to the person who performs it (Penner et al., 2005; Ariely et al., 2009; Dovidio et al., 2017). Human altruism thus directly affect individuals' cognitive decision processes (Lieberman, 2010). Motivated by the psychological literature, the second study extends upper echelons theory by drawing on familiarization theory and self-efficacy theory, to develop a theoretical framework on how CEO self-perceived expertise, as derived from education (science and MBA degrees), can influence corporate environmental CSR ratings and engagement. Below I introduce each of these two studies and the extension of the first study in further details.

1.1. Study 1: CEO Altruism and Corporate Financial Reporting Malfeasance

This study investigates the impact of personal managerial altruism on corporate malfeasance in financial reporting. According to the annual report of philanthropy in the U.S. for the year 2017, Americans' charitable donations were up to 410 billion dollars, of which a significant portion were extraordinary and large stock donations contributed by individual philanthropists who are also CEOs (Giving US 2018). While it is clear that these donations promote social welfare, little research has been conducted to examine the relationship between personal philanthropy and the decision-making of executives at a corporate level.

This research is also motivated by gaps in two streams of literature. First, this study is built upon the prior literature on managerial traits. Specifically, while prior research focuses on the aforementioned traditional personal traits of CEOs, this research is the first to examine personal managerial altruism – a novel aspect of personal managerial traits, which is captured by observing CEO personal stock donation behaviours. Second, my study tends to fill the gap from the literature on corporate philanthropy. Prior studies provide mixed evidence on the relationship between corporate philanthropy and corporate financial performance and firm value (Wang and Qian, 2011; Masulis and Reza, 2014; Su and Sauerwald, 2016). In addition, these studies focus on investigating corporate giving rather than executives' personal charitable contributions, thus the estimated results are limited to provide a comprehensive distinction between the personal philanthropy preferences of executives and corporate philanthropy. This leads to an increasing demand for research investigating separately the role of personal philanthropy of executives in formulating corporate policies. Motivated by the demand for this research topic, the first study in my thesis explores whether the personal altruism of CEOs, which is a primary psychological motive for donating to charity, implies diminishing corporate malfeasance in financial reporting.

Prior social psychology literature describes personal altruism as a prosocial behaviour which includes any of helping, sharing, caring and cooperating with others without a direct benefit or external payoffs and rewards (Batson and Powell, 2003; Penner et al., 2005; Ariely et al., 2009; Dovidio et al., 2017). Economic theory shows that personal altruism can influence the honesty of individual decision makers (Becker, 1976; Gneezy, 2005; Gino et al., 2013). Altruists are willing to sacrifice their own resources to improve the well-being of others, and thus they perceive higher costs of the harm that they may cause to others (Gneezy, 2005; Gino et al., 2013). According to the economic

theory, I argue that altruistic CEOs are less likely to manipulate corporate earnings in a manner that is beneficial for them but comes at the expense of long-term shareholder value and future operating performance (Graham et al., 2005; Gunny, 2005; Bhojraj et al., 2009; Haynes et al., 2015).

Based on the costs and associated risks of each form of earnings manipulation, I sort corporate malfeasance in financial reporting from most serious (corporate fraud), to intermediate (real activities management), to least serious (accruals earnings management). According to the degree to which CEO altruism can affect corporate malfeasance in financial reporting, I examine the hypothesized CEO-altruism effect at all three levels of corporate malfeasance.

To address my research question, I use CEO personal stock donations as a proxy for the personal altruism of CEOs because stock donations to charitable organisations are considered a type of generous giving that is primarily motivated by human altruism (Konrath and Handy, 2018). I collect data on CEO personal stock donations from the Thomson Reuters Insider Trading database from 1996 to 2016. Moreover, I employ two other data sources including the SEC's series of published Accounting and Auditing Enforcement Releases (AAERs) and COMPUSTAT to obtain data on corporate fraud and to capture earnings manipulation, respectively. The full sample construction methodology is discussed in more detail in Section 1.3 of Chapter Two.

Previous research on charitable giving suggests that tax effects have a significant impact on the charitable decisions of donors (Randolph, 1995b; Auten et al., 2000). Prior research provides evidence that firm executives can backdate their stock donations to maximize their personal tax deductions (Yermack, 2009; Ghosh and Harjoto, 2011; Avci et al., 2016). Given the heterogeneity in stock donations, my empirical analyses show

that CEO stock donations can present various degrees of an executives' personal altruism. Specifically, I hypothesize that CEOs making stock donations without backdating behaviour or/and without tax-planning incentives demonstrate higher levels of personal altruism, and thus that their firms will be associated with greater reductions in all three levels of corporate malfeasance in financial reporting.

To address my hypotheses, I first develop a theoretical framework modelling a utility-maximizing function of a CEO with altruistic preferences in the context of his/her decision making to commit earnings manipulation. I then use panel regressions modelling corporate financial malfeasance as a function of CEO personal altruism. The regression results also indicate firms run by CEOs with altruistic preferences, as captured by their stock donations, are less likely to commit financial fraud and exhibit lower levels of real and accrual-based earnings manipulation. These effects are more pronounced for CEOs who do not backdate when making stock donations and who donate stocks outside the tax season. My results are robust to a battery of endogeneity checks, including examining the effect of CEO turnovers, using difference-in-difference models, and applying an instrumental variable approach. Overall, my findings in the first research provide new empirical evidence that corporate executives can imprint their personal altruism to diminish the disciplining effect of corporate malfeasance in financial reporting. This study contributes to the literature on the benefits of hiring altruistic CEOs in minimizing corporate misconduct. Moreover, my research is the first to highlight the "bright-side" effect of how senior management utilize personal managerial caring to set organizational tone and to influence corporate decision making.

1.2. An Extension of Study 1: Potential Measurement Error of CEO Altruism and The Readability of Financial Reports

Chapter Three presents a two-way extension of the first study in Chapter Two. The first addresses potential measurement error of CEO altruism by observing and measuring another five alternative measures of CEO personal altruism other than CEO stock donations. This extension is motivated by a potential concern that the primary explanatory variable in the first study – CEO stock donations – may not completely capture all types of personal managerial altruism. For example, altruistic CEOs may also make other charitable contributions in the form of cash, real estate, time, or even blood and organ donations. Moreover, CEOs may demonstrate other opportunistic intentions rather than personal altruism when making stock donations. For example, CEOs may donate stock to their family charitable trusts or foundations rather than gifting stocks to external charitable organisations. Moreover, CEOs might look to time stock donations around favourable firm earnings announcements, or after receiving a significantly large value of stock awards. The second research extension in this chapter continues examining the effect of CEO altruism but focuses on another form of corporate malfeasance in financial reporting – the readability of a firm's annual report. An opaque presentation of annual reports can reduce the readability of financial reports which in turn can make it easier to obfuscate poor financial information (Bloomfield, 2008; Li, 2008). I argue that the more readable and understandable financial statements are, the better they represent corporate financial performance to stakeholders (Lo et al., 2017). Therefore, the quality of the readability of financial reports also plays an important role in helping stakeholders avoid corporate losses camouflaged in unclear or unreadable financial reports.

In the first part of Chapter Three I explore alternative CEO personal philanthropic activities and potentially opportunistic incentives other than personal altruism when making stock donations. Below I introduce each alternative measure that proxies for the personal altruism of CEOs in more detail.

Following the prior social psychology literature, I first observe CEO personal philanthropy in society by capturing whether CEOs have received humanitarian awards for their charitable contributions. I hand-collect data to compute this new alternative measure from the Marquis Who's Who database. I then employ a propensity score matching approach to pair firms with CEOs who have received a humanitarian award with control firms whose CEOs have not. The average treatment effect results suggest that real activities and accrual management in firms with awarded CEOs are significantly lower than in firms with CEOs who have not been awarded. However, I find no significant difference in the probability of fraud between matched firms.

My second alternative measure of CEO altruism captures the possibility that the recipients of CEO stock donations are external charitable organizations. Depending on the motivations of philanthropic CEOs, CEOs may donate stocks to family charitable foundations or family trusts in response to executives' estate planning considerations and their tax savings on capital gains rather than personal altruism (Jung and Park, 2009; Yermack, 2009; Brown et al., 2017). In contrast, stock donations are gifted to external charitable foundations to improve community well-being and social welfare (Yermack, 2009). As such, I argue that stocks gifted to external charitable foundations reflect CEO altruism more genuinely than stocks gifted to CEO-linked family charitable trusts or foundations. I hand-collect data from the footnotes of each insider gift transaction listed in Forms 4 and 5 SEC filings on the Thomson Financial Insider trading database. I describe further details on the data collection approach in section 3.2.2 of Chapter Three.

The results when using this new proxy are consistent for real activities and discretionary accruals manipulation, but not significant for corporate fraud.

Moreover, the prior social psychological literature on care-oriented feelings suggests that individual altruists in most cases, prefer to give priority to the needs of dependent others, and to improving the boarder well-being of the community (Bowlby, 1982; Fehr and Fischbacher, 2003; Mikulincer et al., 2005; Fehr and Schmidt, 2006). Motivated by this theory, the third alternative measure of CEO altruism demonstrates another type of charitable donation in the form of individual cash contributions made by CEOs to political committees/parties with explicit social purposes for families, children, women, the elderly, health care, environmental issues, education, or animal welfare. Data for CEO personal political cash donations are extracted from the Federal Election Commission (FEC) from 1992 to 2018. I then hand-collect information about political committees and parties from various sources to identify if these bodies support and pursue community welfare objectives. Further details on data collection and sample construction are discussed in Section 3.2.3 of Chapter Three. Similar results as the previous are obtained when using the altruistic political cash donations as a new proxy for CEO altruism.

The next alternative measure of CEO altruism represents the timing pattern of stock gifts made by CEOs relative to the dates of quarterly earnings announcements. Prior studies show that CEOs may take advantage of their insider information to time their trading (sales and purchases) of stock options just before negative (bullet-dodging), or just after positive (spring-loading) earnings announcements (Yermack, 1997; Lie, 2005). Likewise, CEOs may also have explicit opportunistic timing incentives around earnings announcements when making stock donations at an appreciated local stock price, and thus they can gain personal financial benefits from maximizing income tax deductions. Following this argument, I construct a new alternative measure of CEO altruism that

equals one if a CEO donates stocks with no opportunistic timing incentives around earnings announcements (non-"bullet-dodging" and non-"spring-loading"), and zero if they use the "bullet-dodging" or "spring-loading" timing strategies when making stock donations. I discuss more details about the sample construction, empirical analyses and results in Section 3.2.4 of Chapter Three. I obtain similar conclusions when regressing on fraud and accruals management, but no evidence of a significant negative effect on real activities manipulation.

The last of the five alternative measures of CEO altruism further addresses a potential concern of measurement error in CEO altruism. CEOs may have opportunistic incentives to actively rebalance their wealth portfolio by donating shares after being awarded a significantly large value amount of stocks. Building on modern portfolio theory (Markowitz, 1952) and prior literature on portfolio diversification (Ofek and Yermack, 2000; Jin, 2002), this new proxy captures whether stock donations made by CEOs represent genuine personal altruism or a strategic asset diversification to optimize CEO personal wealth. In my empirical analysis, I define the new proxy of CEO altruism as equal to one if a CEO donates stocks even when receiving no stock awards or a relatively small amount of stock awards (in dollar value) in the same fiscal year, and zero if a CEO makes stock donations after receiving a significantly large value amount of stock awards in the same fiscal year. Data for this measure are obtained from the Incentive Lab database. Section 3.2.5 in Chapter Three provides further details on the data collection, sample restrictions, empirical analyses and results. Other than for real activities management, similar results are obtained as in the last research extension to address the potential measurement error of CEO altruism.

The second part in Chapter Three extends the CEO altruism effect to the readability of financial reports. Prior literature shows that top managers can use more complex words

and an opaque financial disclosure to obfuscate undesirable financial performance (Bloomfield, 2008; Li, 2008; Lo et al., 2017; Xu et al., 2018). The reduced readability of financial reports thus may cause potential costs to shareholders and corporate future performance, and thus it can be considered as a least serious form of financial misreporting. Following Bonsall IV et al. (2017), I use data on the *Bog index* to measure financial reporting readability during the 1996 to 2016 period. I replicate all earlier baseline regressions in Chapter Two and turn my attention to the CEO-altruism effect on the *Bog Index*. The empirical results suggest that firms led by altruistic CEOs produce more comprehendible financial reports than firms with non-altruistic CEOs. My findings provide further consistent evidence in support for my earlier findings which highlight the benefits of hiring altruistic CEOs in diminishing corporate financial reporting misconduct.

1.3. Study 2: Difference in Degrees: CEO Educational Background and Corporate Environmental Responsibility

My second study investigates the effect of differences in CEO's educational background on corporate environmental responsibility and engagement. Beyond developing corporate financial performance, firm managers also focus on improving corporate engagement with corporate social responsibility (CSR) initiatives (Flammer, 2013; Flammer, 2015; Hawn and Ioannou, 2016). Corporate environmental violations are associated with not only more significant impact on eco-systems and polluted natural resources but also a substantial loss of shareholder wealth (Flammer, 2013). Despite the importance of corporate environmental responsibility, little research specifically examines firm-level determinants of environment CSR engagement at a corporate level

(Kassinis and Vafeas, 2002; Walls et al., 2012; Liu, 2018). Moreover, while prior literature examines the effect of personal managerial traits on the heterogeneity of corporate financial policies and decision-making outcomes, far less is known about the relationship between managerial backgrounds and characteristics, and environmental engagement and CSR ratings at a corporate level. My second study responds to the gaps in these two streams of literature by investigating whether CEOs' educational backgrounds in science and MBA degrees have significant predictive power over corporate environmental engagement, and how differences in CEO degrees may explain the heterogeneity in environmental policies and practice across corporations.

Building on the psychological literature, I extend upper echelons theory (Hambrick and Mason, 1984) to develop a new theoretical framework by extending familiarity theory and self-efficacy theory to a novel corporate setting. Prior studies suggest that individuals prefer to take greater risks when they become more familiar with a subject matter, and are more risk-averse when dealing with unfamiliar ones (Flanders and Thistlethwaite, 1967; Millon and Lerner, 2003). Likewise, individuals show more risk-taking and tend to be more confident to outperform in areas in which they are experts (Custódio and Metzger, 2014a; Gounopoulos and Pham, 2018; Henderson et al., 2018). Based on this theoretical framework, scientist CEOs are trained with better understanding of science and technology knowledge including environmental science and have greater familiarity with the environmental aspects of their firms' operations. I first hypothesize that science-educated CEOs are more likely to adopt risker environmental policies that lead to worse environmental CSR ratings. Conversely, CEOs with an MBA degree possess greater levels of human capital to deal with complicated business cases (Grimm and Smith, 1991; Geletkanycz and Black, 2001; Graham and Harvey, 2001; Lewis et al., 2014). Moreover, MBA-educated CEOs are trained to perceive and interpret corporate

environmental responsibility as a strategic opportunity to enhance firm value. Consequently, MBA CEOs by virtue of their competency and familiarity with pursing business strategy, show greater confidence and become more aggressive to pursue the benefits from outperforming in environmental CSR. However, CEOs with an MBA education are more risk-averse when taking on additional environmental concerns which are not in their area of specialization. My second hypothesis suggests that MBA CEOs outperform non-MBA CEOs in environmental CSR ratings by conducting more risk-averse environmental policies and practices.

The empirical analysis examines a sample of S&P 1500 firms during 2000-2015. Data on the educational background of CEOs are hand-collected from Marquis Who's Who database. I obtain environmental CSR ratings by Kinder, Lydenberg, and Domini (KLD) from the KLD MSCI Database. I then separately observe the number of environmental strengths and environmental concerns from the KLD dataset to measure and distinguish a firm's environmental engagement with positive eco-friendly initiatives from its environmental weaknesses in the form of environmental concerns.

To address my hypotheses, I first employ panel least squares regressions to regress CEO educational degrees on environmental CSR ratings, environmental strengths and concerns. I then conduct difference-in-difference analyses utilizing CEO turnovers to highlight the impacts of scientist CEOs and MBA CEOs on corporate environmental CSR ratings and engagements. The empirical results indicate that science-educated CEOs take greater environmental risks which result in lower CSR ratings while MBA-educated CEOs outperform non-MBA CEOs in overall environmental CSR ratings because MBA CEOs are more risk-averse in formulating risky environmental policies and tend to avoid taking additional environmental risks. This study improves the literature in both managerial traits and environmental CSR by providing novel empirical evidence that

differences in CEO educational background can be a potent predictor of the heterogeneity in corporate environmental ratings and engagement. From the theoretical perspective, my novel theoretical framework, utilizing familiarity and self-efficacy theories, enables future researchers to conduct further research on executives' self-perceived expertise and risk-taking tendencies. Finally, my findings have practical implications for corporate executives and directors in relation to CEO selection, and for training programs aimed at improving the manner in which executives handle their firms' agenda.

1.4. Contributions

The contributions of this dissertation to the literature on personal managerial behaviours and corporate policies and decision-making are twofold. This thesis provides two novel theoretical frameworks, first, for future research on personal managerial altruism and its impact on decision-making outcomes at a corporate level, and second, for future research on personal managerial qualifications and managerial risk-taking tendencies within areas of expertise. Specifically, the first study develops a theoretical framework modelling a utility-maximizing function of a CEO with altruistic preferences and their decisions to (not) manipulate corporate earnings. This framework optimises the function of costs and benefits when corporate executives with different altruistic preferences choose to commit corporate misdeeds. The second study extends upper echelons theory by drawing on the theories of familiarization and self-efficacy to explain how CEO self-perceived expertise and familiarity with various issues, derived from their educational background, can influence corporate environmental engagement by impacting on CEO perceptions and interpretations of risk-taking in environmental matters.

Second, the thesis contributes to the literature on managerial traits and corporate financial reporting and environmental responsibility, two novel empirical studies which have not previously been explored. The first study in Chapter Two provides an empirical methodology to identify and measure the personal altruism of executives. Moreover, this study is the first to investigate the "bright-side" effect of CEO personal altruism on diminishing corporate misdeeds in financial reporting. Subsequently, the research extension in Chapter Three also provides various unique alternative measures of CEO altruism, including other CEO personal philanthropic activities, CEOs potential opportunistic intentions in making donations and an additional type of CEO charitable donation in the form of cash. Moreover, the extended research on the readability of financial reports is the first to highlight the impact of personal managerial altruism on improved corporate financial report readability. The second study in this thesis explores the influence of CEO educational background on formulating corporate environmental CSR policies and practices. This study sheds light on the literature examining how differences in CEOs' science and MBA educations can explain some of the heterogeneity in their firms' over environmental CSR performance and engagement.

The remainder of this thesis is organised as follows. Chapter Two provides the study of personal managerial altruism and its impact on corporate malfeasance of financial reporting. Chapter Three provides the extension of the first study by addressing potential measurement error of CEO altruism and offering a further extension to investigate the effect of CEO altruism on the readability of financial reports. Chapter Four provides the study of CEO educational background and corporate environmental responsibility. Chapter Five concludes with a summary of the findings, the significance of the contributions made, limitations, and future research pathways.

CHAPTER 2

CEO PERSONAL ALTRUISM AND

CORPORATE MALFEASANCE IN FINANCIAL REPORTING

2.1 Introduction

In 2017 Americans donated 410 billion dollars to U.S. charities, an increase of 5.2% on 2016, with much of this difference driven by extraordinary and large stock donations from philanthropists who are also CEOs (Giving USA 2018).[2] Prominent examples include; Michael Dell and his wife, who gifted 1 billion dollars of stock to their foundation; Mark Zuckerberg and his wife, who pledged to donate 99% of their Facebook stock; and Warren Buffett, who gave away 3.17 billion dollars in Berkshire Hathaway stock to charitable organisations (Reuters, July 11th 2017). This remarkable generosity is consistent with recent research showing that altruism is the primary psychological motive for donating to charity (Konrath and Handy, 2018). While it is clear that these donations promote social welfare, far less is known about the relationship between personal philanthropy and the decision making of executives at the corporate level. Specifically, does the personal altruism of CEOs imply diminishing corporate malfeasance in financial reporting?

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[2]Giving USA 2018: The Annual reporting on Philanthropy for the Year 2017, released on 12th June 2018

Economic theory shows that personal altruism can influence the honesty of individual decision makers (Becker, 1976; Gneezy, 2005; Gino et al., 2013). Human altruism is an unconditional kindness such that one is willing to sacrifice their own resources to improve the well-being of others, without concealed motives (Fehr and Fischbacher, 2003; Fehr and Schmidt, 2006). Altruists do care about the well-being of others, and thus they may be more sensitive to the harm that their acts can cause to others (Gneezy, 2005; Gino et al., 2013). In theory, when altruistic CEOs are faced with deciding whether or not to commit corporate misdeeds, they should place added weigh on the benefits of their decisions for firms, shareholders and stakeholders other than themselves. They might therefore also be less likely to 'cook the books' or manipulate corporate earnings – something which is beneficial for executives but comes at the expense of long-term shareholder value and future firm operating performance (Graham et al., 2005; Gunny, 2005; Bhojraj et al., 2009; Haynes et al., 2015).

In contrast, greedy or selfish CEOs are more likely to act dishonestly whenever they can extract benefits from their actions, even if they harm others (Haynes et al., 2015; Haynes et al., 2017). Suspect CEOs are also more likely to act opportunistically or unethically, and are more likely to commit corporate malfeasance, especially if they have a track record of personal indiscretions (Biggerstaff et al., 2015; Cline et al., 2017). These characteristics distinguish egoistic from altruistic CEOs and imply that the likelihood of engaging in corporate financial reporting malfeasance is contingent upon the costs to long-term firm performance and stakeholder well-being.

Schipper (1989) defines earnings management as "*a purposeful intervention in the external financial reporting process, with the intention of obtaining some private gain*". The most aggressive form of earnings management, which clearly violates the generally

accepted accounting principles (GAAP), is corporate fraud. Prior studies show that corporate financial fraud is associated with increased firm cost of capital (Dechow et al., 1996), greater risk of litigation losses (Bonner et al., 1998), and damaged firm reputation (Cline et al., 2017). Corporate malfeasance in financial reporting can also take other, less severe, forms. For instance, CEOs can manipulate firm earnings based on real activities or by using accrual-based earning management, both of which can also increase the risk of losses in firm value. Gunny (2005) finds that real activities geared at manipulating earnings have an economically significant and negative impact on subsequent firm operating performance, while Bhojraj et al. (2009) show that firms using accrual-based earnings management sacrifice future firm operating and stock performance to beat short-term analyst forecasts. In addition, prior research also shows that accrual-based earning management increases the risk of audit and other regulatory scrutiny (Graham et al., 2005; Cohen et al., 2008; Zang, 2012), and that corporate financial misstatement harms shareholders via substantial litigation losses (Bonner et al., 1998; Palmrose and Scholz, 2004).

I sort corporate malfeasance in financial reporting from most serious (corporate fraud), to intermediate (real activities manipulation), to least serious (accrual-based earnings management), based on the costs and associated risks of each form of earnings manipulation. Given the significant repercussions of all three malfeasance levels for firm performance, shareholder wealth, and the well-being of stakeholders, I hypothesize that firms with altruistic CEOs will be less likely to commit fraud, and will also be less likely to engage in real activities and accrual-based earnings management relative to firms with non-altruistic CEOs.

To address my hypothesized CEO-altruism effect, I use CEO personal stock donations as a proxy for CEO altruism because donating stocks to charity is a type of giving that is motivated by human altruism (Konrath and Handy, 2018). My sample consists of 32,741 stock donations from 4,014 unique CEOs listed on the Thomson Reuters Insider Trading database between 1996 and 2016. Since I am interested in the effect of CEO altruism on corporate financial reporting malfeasance, I use two main data sources to compute my dependent variables. First, I extract data on accounting fraud from the SEC's series of published *Accounting and Auditing Enforcement Releases* (AAERs).[3] Second, I use COMPUSTAT to capture earnings manipulation, including both real activities management and discretionary accruals (Dechow et al., 1995; Roychowdhury, 2006; Kim et al., 2012). My study also relies on control variables including firm characteristics, corporate governance measures, and executive incentives, all of which are extracted from COMPUSTAT, 13-F filings, Risk Metrics, EXECUCOMP and Marquis Who's Who.

Motivated by prior research on CEO backdating of stock gifts (Jung and Park, 2009; Yermack, 2009; Ghosh and Harjoto, 2011; Avci et al., 2016), my empirical analyses show that CEO stock donations can present various degrees of an executive's personal altruism. Specifically, the stock donations of CEOs who intentionally time their endowments to maximize their tax deductions demonstrate less altruistic behaviour relative to stock donations by CEOs who do not time their endowments. I argue that CEOs who make stock donations without self-interested fiscal preferences (i.e. without backdating or tax-

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[3] The SEC takes enforcement actions again corporations and corporate executives, auditors and other insiders involved in violations of SEC and federal rules. The SEC reviews the financial statements of public firms each year and assesses firm compliance with GAAP. At the completion of a significant investigation involving accounting or auditing misconduct, the SEC issues an AAER.

based timing of donations) demonstrate stronger altruism. Following my first hypothesis, I hypothesize that CEOs with higher levels of altruism will be associated with greater declines in all three levels of corporate financial reporting malfeasance.

My univariate results examine corporate financial reporting malfeasance against dummies for CEO donations, CEO backdating, and CEO tax planning incentives. These initial results are in line with my hypotheses and suggest that firms with CEOs who donate stock, without backdating and without acting according to tax incentives, are less likely to be the subject of SEC AAERs and have lower average values of abnormal accruals and abnormal real activities management, relative to firms without altruistic CEOs.

To better examine my hypotheses, I use panel regression models of corporate financial malfeasance as a function of CEO personal altruism. My regression results also indicate that managerial altruism is associated with lower financial reporting malfeasance, after controlling for industry and year fixed effects, as well as firm and CEO characteristics. Specifically, I estimate that the probabilities of fraud, real activities and discretionary accrual-based earnings management each decrease by about 41.3%, 14.0% and 13.9%, respectively, when the number of times a CEO donates stock increases by one standard deviation. Second, I find evidence of an economic effect from higher levels of altruism, as captured through CEOs avoiding backdating and tax planning incentives. On average, firms with more altruistic CEOs, display probabilities of fraud, real activities and discretionary accrual-based earnings management which are about 58.1%, 90.7% and 87.4% lower than those of firms with less altruistic CEOs who do not donate stock or who make self-interested donations. My findings are consistent both when using a dummy or a ratio measure of CEO stock donations.

One concern is that my results might be endogenously determined. First, the omission of unobservable characteristics can increase the risk of spurious correlation between CEO altruism and corporate financial reporting malfeasance. To address this issue, I control for time-invariant firm-specific characteristics. In this analysis, my sample includes only firms which experience a CEO turnover, and specifically those firms which go from having a more altruistic CEO to a less altruistic CEO, or vice versa. I use data on CEO turnovers from the EXECUCOMP database. I find that firms run by altruistic CEOs (i.e. those more likely to donate stock), on average, have a 2.6% lower probability of fraud, and 4.7% and 16.3% lower probabilities of using real activities and discretionary accruals, respectively. These results hold while I control for differences in firm characteristics, corporate governance variables, and CEO incentives, as well as when I include industry, firm and year fixed effects. Admittedly, I recognize that I cannot control for all potentially relevant CEO characteristics, and also that these can change due to CEO transitions.

My firm effects regressions on the sample of transitioning CEOs may not be sufficient to address the possibility of selection bias among CEOs who experiences a turnover. To address this concern, I use propensity score matching estimators and different-in-different (DID) approach to compare differences in corporate financial reporting malfeasance between the treated firms (those experience a CEO replacement from a non/less-altruistic CEO to an altruistic CEO) and the control firms (those experience a CEO turnover from a non/less-altruistic to another non/less-altruistic CEO) from the pre-turnover to post-turnover periods. I employ a propensity score matching approach to pair-match each treated firms with a control firm that experiences a CEO turnover from a non/less-altruistic CEO to a non/less-altruistic CEO during the entire sample period. The estimated DID result evaluates the impact of a treatment effect (a

replacement of a more altruistic CEO for a non/less-altruistic CEO) on corporate financial reporting malfeasance, compared to the matched control firms. My results show that in the prior turnover period, the treated firms significantly manipulate discretionary accruals more than the control firm. However, in the post-CEO turnover period, the treated firms with a CEO transition of an altruistic CEO for a non-altruistic CEO, experience 37.4% lower average accruals management relative to control firms without a replacement to an altruistic CEO. The difference in differences of accruals management from the prior to the post-turnover period the between the treated and control firms is negative and statistically significant, indicating that the treatment effect (a CEO turnover of an altruistic CEO for a non-altruistic CEO) in the treated firms, decreases discretionary accruals, on average, by approximately, 15.2%, when compared to the average value of accruals management of firms in my sample. Similar conclusions are obtained when I examine changes in the probabilities of fraud and real activities manipulation for the sample of transition firms.

Finally, another concern in my initial estimations might be driven by a potential simultaneity bias. The simultaneous causality may potentially arise because CEOs may donate more stocks when they manipulate earnings to be high such that the stock price goes up, to gain their personal tax benefits from their donations of appreciated stocks. To address this concern, I use two-stage least squares (2SLS) regressions with a binary endogenous variable of CEO stock donations and a binary instrumental variable (IV) for CEOs who engage in child-caregiving activities. Data for this is again collected from the Marquis Who's Who database. To select my IV I follow the attachment theory of Ainsworth et al. (1978) and Bowlby (1982), which argues that altruistic behaviour can be defined as caregiving, support, and protection for dependent others, in response to their

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needs, and especially for infants and young children. Theoretically, my IV meets the relevancy condition because it is correlated with personal altruistic behaviours (Ainsworth et al., 1978; Bowlby, 1982; Mikulincer et al., 2005), and also satisfies the exclusion condition because there is no reason to think that managerial influence on corporate financial reporting will lead to changes in involvement with voluntary caregiving to children. The results from my 2SLS estimations continue to show a statistically significant negative effect of CEO altruism on corporate financial malfeasance.

In addition, I also employ several alternative measures of CEO altruism to keep my results free from potential measurement errors of personal management altruism. Following the psychology literature, I first use a dummy based on the number of humanitarian awards received as an alternative proxy for CEO personal altruism. Data for this are collected from the Marquis Who's Who database. I reach similar conclusions when I use this measure to proxy for CEO altruism.

Moreover, to address common concerns on the complicated nature of recipients of CEO donations, I then inspect whether CEOs donate stocks to recipients who are external charitable organisations or who are family members, family funds and other entities related to CEOs' own personal benefits. I use this measure as an alternative explanatory variable of the CEO-altruism effect. My results are consistent for real activities and discretionary accruals manipulation, but not significantly holding for corporate fraud. In addition, I reach similar conclusions when I investigate whether CEOs make cash donations (of $200 or more) with altruistic preferences to political committees and parties which primarily supports for family, child, female, elderly, health care, environment, education, or animal welfare issues.

My results might be further subject to measurement error that CEOs may donate stocks before negative earnings announcements or after positive earnings announcements. In either case, CEOs' stock donations are more likely to reflect their exploitation of insider information and tax planning consideration. To address this potential concern, I examine the timing pattern of CEO stock donations around the quarterly earnings announcements. Specifically, I consider whether or not CEOs well-time their stock donations just before negative earnings announcements (bullet-dodging), or just after favourable earnings (spring-loading). I obtain similar conclusions when regressing on fraud and accruals management, but no evidence of a significant negative effect on real activities manipulation.

Finally, another potential measurement error in my primary proxy of CEO altruism is that CEOs may donate more stocks after receiving additional stocks in their firms. To address this additional concern, I investigate the effect of CEO altruism, which alternatively is proxied by whether CEOs donate stocks without their strategic incentives to actively rebalance their wealth portfolio after receiving a significantly large value amount of their firm stocks. Other than real activities management, similar results are obtained in this robustness check.

To examine the CEO altruism effect on a boarder forms of corporate financial reporting, I examine the effect of CEO altruism on corporate malfeasance in the context of the readability of annual financial reports that top managers can use complex disclosure to hide information from investors. My results also remain consistent and strongly support for my main hypotheses.

My research contributes to three streams of literature. The first examines prosocial preferences in terms of their related outcomes on social and economic activity (Anderhub

et al., 2001; Anderhub et al., 2002; Fehr and Rockenbach, 2003; Fehr and List, 2004; Tyran, 2004; Riedl and Tyran, 2005; Ackert et al., 2006; Cabrales and Charness, 2013), and corporate performance and portfolio choice (Riedl and Smeets, 2013; Haynes et al., 2015). Much of this research uses laboratory or field data on generalised types of other-regarding preferences rather than altruism as measured by significant acts of financial philanthropy. As far as I know, my study is the first to empirically investigate the effect of personal managerial altruism on corporate decision making in the context of financial reporting malfeasance.

The second literature steam studies how senior management uses personal managerial caring to set organisational tone and to influence corporate decision making. Cronqvist and Yu (2017) find a positive association between CEO prosocial preferences and corporate social responsibility when CEOs have daughters. Although I also examine personal prosocial effect, my study provides novel evidence on the influence of CEO altruism on diminishing corporate malfeasance in financial reporting, after controlling for the prosocial effects of female socialisation captured by CEOs having daughters (Cronqvist and Yu, 2017).

The third literature stream explores the 'dark-side' effect of personal managerial traits on corporate financial reporting misconduct. Prior studies focus on misdeeds revealed in personal lives of executives, including legal infractions (Davidson et al., 2015); allegations of dishonesty, substance abuse, sexual misadventure, and violence (Cline et al., 2017); as well as marital infidelity (Griffin et al., 2017). In contrast, my study focuses on the benefits of having altruistic CEOs who are associated with reduced corporate misdeeds in financial reporting. Further, my research is the first to differentiate

between the beneficial effects of personal and corporate philanthropy in minimizing corporate financial malfeasance.

The remainder of the chapter is organized as follows. Section 2 outlines the underlying theoretical framework of utility-maximizing altruistic executives and develops my CEO-altruism effect hypotheses. Section 3 describes the data, sample construction and summary statistics. Section 4 presents univariate and multivariate analyses which investigate the effect of CEO altruism on corporate financial malfeasance, and further reports robust results for potential endogeneity concerns. Section 5 concludes.

2.2 Theoretical and Hypothesis Development

2.2.1 Theoretical framework

I present a simple theoretical framework modelling a utility-maximizing function of a CEO with altruistic preferences in the context of his decision making to manipulate corporate earnings. To illustrate, I assume that a representative executive can engage in earnings management *(e)* to generate private benefits[4] *B(e)*, where *B(e)* is an increasing function such that $\frac{dB(e)}{de} > 0$ and $\frac{d^2B(e)}{de^2} < 0$. However, corporate misdeeds in the reporting of earnings can reduce the well-being of stakeholders and shareholders, denoted *S(e)*, where *S(e)* is a decreasing function and $\frac{dS(e)}{de} < 0$. To the extent that executives cannot

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[4] These benefits include increased equity-based incentive compensation (Cheng and Warfield, 2005; Bergstresser and Philippon, 2006; Burns and Kedia, 2006; Efendi et al., 2007; Cornett et al., 2008), increased insider stock trading benefits (Collins and Hribar, 2000; Beneish and Vargus, 2002; Sloan, 2005; Bergstresser and Philippon, 2006), and boosting operational flexibility and managerial control power (DeFond and Jiambalvo, 1994; Sweeney, 1994).

commit corporate misdeeds without impunity, earnings manipulation also imposes potential costs to firms, corporate managers, and stakeholders[5], which I denote *C(e)*, where *C(e)* is an increasing function such that $\frac{dC(e)}{de} > 0$ and $\frac{d^2C(e)}{de^2} > 0$. The standard utility function of CEO_i is:

$$U_i = B(e) + \alpha_i S - C(e) \tag{1}$$

where U_i is the utility of CEO_i and α_i is the degree of personal altruism of CEO_i. I assume that α_i is constant and that $0 \leq \alpha_i \leq +\infty$ such that CEO_i either has no altruistic preferences ($\alpha_i = 0$), or altruistic preferences ($\alpha_i > 0$), represented in their utility function. The utility-maximising function of CEO_i can then be described by taking the first-order derivative of function (1):

$$\frac{dU_i}{de} = \frac{dB(e)}{de} + \alpha_i \frac{dS(e)}{de} - \frac{dC(e)}{de} = 0 \tag{2}$$

Proposition 1: CEOs with altruistic personal preferences will be less likely to manipulate firm earnings than CEOs with no altruistic preferences.

Proof. From **(2)**, if $\alpha_i = 0$, then $\frac{dB(e)}{de} = \frac{dC(e)}{de}$; $\forall e$ **(3a)**; and if $\alpha > 0$, then $\frac{dB(e)}{de} + \alpha_i \frac{dS(e)}{de} < \frac{dC(e)}{de}$; $\forall e$ **(3b)**. From **(3a)** and **(3b)**, I have $e^*_{\alpha_i > 0} < e^{**}_{\alpha_i = 0}$. This implies that to maximize the utility of engaging in earnings management, altruistic CEOs, who care about the well-being of stakeholders, will manipulate earnings less than non-altruistic CEOs, who does not care about the well-being of stakeholders.

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[5] The potential costs of earnings management include forced CEO turnover (Hazarika et al., 2012), transparency costs to shareholders (Leuz et al., 2003), increased costs of external financing (Dechow et al., 1996), higher risk of auditor and regulatory scrutiny, and corporate ligation losses (Bonner et al., 1998; Palmrose and Scholz, 2004; Graham et al., 2005; Cohen et al., 2008; Zang, 2012).

Proposition 2: Altruistic CEOs with higher levels of altruism will manipulate reported earnings less than altruistic CEOs who have lower levels of altruism.

Proof. By the implicit function theorem, if I take the derivative of e with respect to α, and that of α with respect to e, **(2)** can therefore be described by totally differentiating the implicit function $\left(\frac{d^2 B(e)}{de^2} + \alpha_i \frac{d^2 S(e)}{de^2} - \frac{d^2 C(e)}{de^2}\right) de + \frac{dS(e)}{de} d\alpha = 0$ This gives the function $\frac{de}{d\alpha} = - \frac{\frac{dS(e)}{de}}{\left(\frac{d^2 B(e)}{de^2} + \alpha_i \frac{d^2 S(e)}{de^2} - \frac{d^2 C(e)}{de^2}\right)}$ that results in $\frac{de}{d\alpha} < 0$ **(4)**.This theoretical framework thus implies that earnings manipulation is negatively associated with the personal altruism of CEOs. In other words, altruistic CEOs with higher levels of personal altruism will manipulate reported earnings less than altruistic CEOs with lower levels of personal altruism.

2.2.2 CEO personal characteristics and financial reporting

Research on the effects of top executives' personal characteristics on corporate-level decision outcomes was largely limited until Hambrick and Mason (1984) developed Upper Echelons Theory. This theory suggests that personal managerial characteristics affect how top executives assess and interpret the situations they face, and that this can lead their decision making at a corporate level (Hambrick and Mason, 1984; Hambrick, 2007). Consistent with the theory, prior empirical studies show that managerial fixed effects have an impact on corporate decisions and performance (Bertrand and Schoar, 2003; Fee et al., 2013), and on ethics in financial reporting (Bamber et al., 2010; Dyreng et al., 2010; Brochet et al., 2011; Ge et al., 2011; Dejong and Ling, 2013).

Other studies take significant steps toward showing the effect of specific managerial styles, rather than merely managerial fixed effects, on corporate decisions and policies. These studies report significant associations between CEO overconfidence and corporate investment and financing decisions (Malmendier and Tate, 2005, 2008; Malmendier et al., 2011; Yu, 2014b), CEO optimism and corporate investment and cash holdings policies (Lin et al., 2005; Campbell et al., 2011; Langabeer and DelliFraine, 2011; Davis et al., 2015; Huang-Meier et al., 2016), and CEO perquisite and professional abilities and corporate performance and financial policies (Yermack, 2006; Kaplan et al., 2012; Custódio and Metzger, 2014b). Moreover, previous studies also show behavioural consistencies between personal executive risk-taking experience and corporate risk (Malmendier and Nagel, 2011; Benmelech and Frydman, 2015; Cain and McKeon, 2016), and CEO personal debt and corporate leverage (Cronqvist et al., 2012).

Prior research also finds evidence linking the personal characteristics of executives to corporate financial reporting practices. Some examples are the relation between CEO overconfidence and earnings manipulation (Schrand and Zechman, 2012; Yu, 2014a), CEO facial masculinity and financial misreporting (Jia et al., 2014), and CEO military experience and corporate tax avoidance and financial fraud (Law and Mills, 2013; Benmelech and Frydman, 2015). Finally, some recent studies have linked executives' personal misdeeds (i.e. allegations of dishonesty, legal infractions, criminal conduct and marital infidelity) to corporate financial misconduct and performance (Davidson et al., 2015; Cline et al., 2017; Griffin et al., 2017).

2.2.3 CEO personal altruism and corporate malfeasance in financial reporting

My study also builds on the social psychology literature that describes personal altruism as a prosocial behaviour – any behaviour which increases the welfare of others without a direct benefit to the person who performs it (Penner et al., 2005; Ariely et al., 2009; Dovidio et al., 2017). Prior research in social biology shows that there are areas of the human brain which are responsible for empathy, altruism and helping (Lieberman, 2010), that in turn directly affect individuals' cognitive decision processes. However, personal altruism can be more pronounced for some individuals, in part because of their biological nature and in part due to social learning from other people (Batson, 2011). I therefore expect that differences in the altruistic preferences of CEOs will lead to differences in terms of decision outcomes via changes in the cognitive process. In contrast to this, Becker (1968) suggests that the decision to commit fraud is the outcome of personal cost-benefit analyses. However, in the presence of altruistic preferences in the cognitive process, CEOs should consider not only their own costs and benefits, but also the well-being of other firm stakeholders.

With respect to the trade-off between the costs and benefits of financial malfeasance, prior research suggests that corporate malfeasance including accounting fraud and earnings manipulations, purposely benefits a minority of shareholders and top managers at the expense of firms and the majority of other stakeholders.[6] In addition, CEOs who behave altruistically are more likely to experience greater emotional costs from committing fraud. Indeed, in order to optimize their utility, altruistic CEOs will be less

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[6] See references in footnote 4.

likely to commit corporate misdeeds where the costs to others outweigh any benefits. Thus, my first hypothesis is:

H1: Firms with altruistic CEOs are less likely to engage in corporate financial reporting malfeasance.

Specifically, conditional on the degree to which altruism can affect corporate malfeasance, I hypothesize:

H1a: Firms with altruistic CEOs are less likely to commit fraud.

H1b: Firms with altruistic CEOs are less likely to undertake real activities to manipulate corporate earnings.

H1c: Firms with altruistic CEOs are less likely to engage in accrual-based earnings manipulation.

2.2.4 Level of personal managerial altruism reflected in CEO stock donations

Prior research on charitable giving indicates that the tax considerations of charitable donations are relevant to donors (Randolph, 1995a; Auten et al., 2002). For example, Auten et al. (2002) show that tax reform and changes in the relevant tax treatment of donations significantly affect the level of giving. Moreover, Randolph (1995) finds that donors may time their gifts in order to maximize deductions when tax rates are high.

Other research also shows that firm executives can backdate their stock donations to maximize their personal tax deductions (Yermack, 2009; Ghosh and Harjoto, 2011; Avci et al., 2016). Backdating involves CEOs retrospectively selecting their firm's highest

historical stock price date as their gift date,[7] and implies that such stock donations are reported with delays.[8] The greater the time elapsed between the gift and filing dates, the greater the opportunity for CEOs to backdate their donation (Yermack, 2009). To the extent that CEOs cannot gain tax benefits from backdating without impunity, backdated stock donations can be recognized by shareholders as a signal of managers with self-interested, rather than purely altruistic, incentives. For example, Ghosh and Harjoto (2011) find that shareholders react more negatively to donations that are announced later rather than earlier on in the year. Thus, CEOs making backdated stock donations demonstrate less altruism than CEOs who do not.

Given the heterogeneity in stock donations, I further argue that, in addition to donation backdating, other tax-based incentives around the timing of stock donations can also provide insight into the motivations of philanthropic CEOs. Specifically, in the U.S. personal annual tax liabilities manifest in December. This is an ideal time for executives with tax planning incentives to donate stocks. I draw on the limited-capacity theory of attention, which suggests that humans are cognitively limited when processing information (Engle and Kane, 2004; Posner and Snyder, 2004), to argue that CEOs will not be able to focus on tax planning at all times. Instead, I expect that CEOs will pay greater attention to their tax affairs during the peak of the December tax season. Therefore, stock donations made around tax time can be interpreted as being driven at

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[7] Gift date refers to the date reported in the SEC filing Form 4 in which a corporate insider (such as a CEO) gifts stock. Gift dates are different to filing dates – where a filing date is the date a corporate insider (such as a CEO) reports filing a Form 4 and submits it to the SEC. Filing dates must occur after a gift date. Donated stock transactions are only effective once the SEC receives a Form 4.

[8] The SEC requires that insiders report their stock gifts within 45 days of fiscal year end for the period in which stock is donated.

least in part by managerial self-interest. I characterize CEOs who make stock donations in line with their personal taxation interests as less altruistic than CEOs who do not. Thus, my second hypothesis is:

H2: Firms with altruistic CEOs who donate stocks without personal financial motives have a lower probability of corporate financial reporting malfeasance.

And, dependent on the degree to which it can impact corporate malfeasance:

H2a: Firms with altruistic CEOs who donate stocks without personal financial motives are less likely to commit fraud.

H2b: Firms with altruistic CEOs who donate stocks without personal financial motives are less likely to undertake real activities to manipulate corporate earnings.

H2c: Firms with altruistic CEOs who donate stocks without personal financial motives are less likely to engage in accrual-based earnings manipulation.

2.3 Data, Sample Construction and Summary Statistics

2.3.1 CEO stock donations

The identification of personal altruism is not straightforward. Limited information on the personal behaviours of CEOs and insufficient data on the psychological factors related to personal managerial altruism make it challenging to empirically identify and completely measure personal managerial altruism. To overcome these issues, I use CEO personal stock donations as a proxy for CEO altruism because donating stocks to charities

is a type of charitable giving that is motivated by human altruism (Konrath and Handy, 2018) in order to contribute good works to society (Yermack, 2009; Avci et al., 2016). Further, it is also feasible to access data on managerial stock donations through U.S. SEC Form 4 filings. Another advantage is that CEO personal stock donations are, by definition, distinct from corporate charitable contributions, thereby allowing us to examine the effect of managerial altruism, separate from the effect of corporate charitable culture, on corporate financial disclosure malfeasance.

Gifts of stock made by corporate CEOs are required to be publicly reported to the SEC either via Form 4 or Form 5 filings. Since the Sarbanes-Oxley Act in 2002, the SEC requires disclosures of open market sales and purchases on Form 4 filings within two business days of the transaction. However, older disclosure rules continue to apply to Form 5 for bona fide gifts of stock, such that the SEC allows filing to be submitted up to 45 days after the end of a company's fiscal year.

I collect data on stock donations by corporate CEOs from the Thomson Financial Insider Trading database between 1996 and 2016 (TFN insider filing data).[9] This data is compiled from the Form 4 and Form 5 SEC filings of corporate insiders. Since I am interested in stock donations by CEOs, I retrieve all transactions by way of gift (transaction code G) made by insiders who list one of their job titles as CEO (rolecode = CEO). I exclude observations that Thomson indicates are problematic or unable to be cleaned because of missing, invalid or inconsistent data. Following Yermack (2009), I exclude gifts of securities other than common stock (e.g. preferred stock or warrants). To

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[9] To avoid missing data and sample selection bias when merging data on stock donations with other data used in my empirical analysis, I choose 1996 as the first year I look at, since data on corporate governance variables from the ISS (formerly Risk Metrics) database is only available from 1996.

avoid double-counting donations, I also drop duplicated observations of gifts which are reported more than once. Moreover, to reduce heterogeneity in the CEO-altruism effect caused by a firm having multiple CEOs in a single fiscal year, I exclude a small number of observations where firms had more than one CEO donate stock during a year. This filtering leaves us with 32,741 unique stock donations from 4,014 unique CEOs between 1996 and 2016. Using this sample, I then generate three measures of CEO stock donations. First, I create a dummy of stock donations (*DumDonate*) that equals one if a CEO made a stock donation during a calendar year, and zero otherwise. Second, I use a continuous variable which captures the total number of CEO stock donations (*#Donate*) in a given year. Finally, I calculate the ratio of shares donated to total shares owned in the firm (*DonateRatio*).

Following Yermack (2009), I capture potential backdating of stock gifts by looking at the number of days elapsed between the reported gift date and its SEC filing date. Longer reporting delays allow CEOs to select from larger sets of dates for backdating purposes (Yermack, 2009; Ghosh and Harjoto, 2011; Avci et al., 2016). Moreover, prior studies show that reporting time lags can vary from short delays of three to twenty days, to long delays of more than twenty days (Avci et al., 2016), up to until the next calendar year (Yermack, 2009). I thus use a strict criterion and define CEOs as less likely to backdate when their donation is within two trading days of the filing date. For CEOs with one or more donations in a year, I calculate *NonBackdate*, a dummy equal to one only if

all stock donations in that year are non-backdated (i.e. SEC filing is within two trading days of the donation date).[10]

To capture CEO tax planning incentives, I develop a dummy for whether SEC filings occur during the off-peak period in the U.S. federal tax season. This covers all time periods except the period from the 1st of December to the 15th of April of the next calendar year. In keeping with my approach for CEOs who make more than one stock donation in a year, I calculate *NonTaxplanning* as a dummy equal to one for CEOs who have all of their stock donations filed outside of the peak tax season, and zero otherwise.[11]

2.3.2 Levels of corporate malfeasance in financial reporting

I first consider fraud – the most aggressive form of earnings management which violates the GAAP. Following Dechow et al. (2011), I extract data on accounting fraud from the SEC's series of published AAERs. AAERs represent cases where the SEC has sufficient evidence of accounting or auditing misconduct against firms and corporate executives. I initially collect a sample of 1,327 AAERs, on 506 unique firms, released between 1996 and 2016. I then drop firms with missing GVKEY and inconsistent reporting periods, leaving us with 905 AAERs on 347 distinct firms in my final sample.

Second, I look at real activities manipulation – purposeful managerial actions directed at operational activities which create abnormal changes in operational cash flow

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[10] My results are also significant and consistent when I use two other criteria for calculating *NonBackdate* including (1) when CEOs have more than 50 percent non-backdated donations, or (2) when CEOs have at least one non-backdated donation in a calendar year.

[11] My results are also significant and consistent when I apply two similar criteria (when CEOs have more than 50 percent or at least one non-tax planned donation in a calendar year) for calculating *NonTaxplanning*.

(OCF) (Roychowdhury, 2006; Zang, 2012). Roychowdhury (2006) shows that CEOs can influence reported earnings by manipulating sales, overproduction, or by cutting discretionary expenditures. These activities potentially impose greater long-term costs on certain shareholders because they can negatively affect future cash flows and may hurt long-term firm performance (Roychowdhury, 2006; Chi et al., 2011). Following Roychowdhury (2006), Cohen et al. (2008), and Cohen and Zarowin (2010), I use three proxies of real activities management, including abnormal OCF, abnormal discretionary expenditures, and abnormal production costs. To capture the overall effect, I sum the absolute values of all abnormal real activities to create an aggregate measure of real earnings management which reflects attempts to alter earnings in both positive and negative directions (Cohen et al., 2008; Chi et al., 2011; Kim et al., 2012).

Data to estimate my proxies of real activities management are from the COMPUSTAT database. I drop firms from the financial and utilities industries, and I require at least ten observations in each industry-year grouping for my regressions. To eliminate extreme observations, I also winsorize all measures of real earnings management at the top and bottom 1%. Following Roychowdhury (2006) and Cohen et al. (2008), I measure abnormal OCF, discretionary expenses and production costs as the residuals from the following two-digit SIC cross-sectional industry regressions:

$$\frac{OCF_{i,t}}{A_{i,t-1}} = \alpha_1 \frac{1}{A_{i,t-1}} + \alpha_2 \frac{REV_{i,t}}{A_{i,t-1}} + \alpha_3 \frac{\Delta REV_{i,t}}{A_{i,t-1}} + \epsilon_{i,t} \tag{5}$$

where $OCF_{i,t}$ is operational cash flow of firm i in year t (annual COMPUSTAT data item 308); $A_{i,t-1}$ is total assets in year t-1 (data item 6); $REV_{i,t}$ is year t sales (data item 12); and $\Delta REV_{i,t}$ is the change in sales from year t-1 to year t;

$$\frac{Prod_{i,t}}{A_{i,t-1}} = \alpha_1 \frac{1}{A_{i,t-1}} + \alpha_2 \frac{REV_{i,t}}{A_{i,t-1}} + \alpha_3 \frac{\Delta REV_{i,t}}{A_{i,t-1}} + \alpha_3 \frac{\Delta REV_{i,t-1}}{A_{i,t-1}} + \epsilon_{i,t} \qquad (6)$$

where $Prod_{i,t}$ are production costs, defined as the sum of cost of goods sold (data item 41) and change in inventory in year t (data item 3);

$$\frac{DISX_{i,t}}{A_{i,t-1}} = \alpha_1 \frac{1}{A_{i,t-1}} + \alpha_2 \frac{REV_{i,t}}{A_{i,t-1}} + \epsilon_{i,t} \qquad (7)$$

where $DISX_{i,t}$ are discretionary expenses in year t, defined as the sum of advertising expenses (data item 45), R&D expenses (data item 46) and SG&A expense (data item 189). Abnormal OCF, abnormal discretionary expenses, and abnormal production costs are then computed as the differences between the actual values and the levels predicted by equations (5) to (7), respectively. The aggregate measure of real activities management (*RealActMan*) is the sum of the absolute values of all three abnormal real activities.

Third, I look at accrual-based earnings management – achieved when executives change the accounting methods or estimates within GAAP choices used to represent underlying firm activities (Zang, 2012). Income data on firms is again extracted from the COMPUSTAT database. I use the cross-sectional model of Jones (1991) to estimate firm discretionary accruals because this model outperforms time-series models in detecting earnings management[12] (Bartov et al., 2000):

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_1 \frac{1}{A_{i,t-1}} + \alpha_2 \frac{\Delta REV_{i,t}}{A_{i,t-1}} + \alpha_3 \frac{PPE_{i,t}}{A_{i,t-1}} + \epsilon_{i,t} \qquad (8)$$

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[12] I also calculate discretionary accruals using the modified Jones model (Dechow et al., 1995), the modified Jones model with book-to-market (Larcker and Richardson, 2004) and the modified Jones model with matched firm performance (Kothari et al., 2005). I obtain similar conclusions about the CEO-altruism effect on accrual-based earning management when using these measures of discretionary accruals, consistent with those obtained from using the Jones model.

where $TA_{i,t}$ is the total accruals of firm i in year t, measured as the difference between earnings before extraordinary items and discontinued operations (COMPUSTAT data item 123) and operating cash flows (data item 308); and $PPE_{i,t}$ is gross property, plant and equipment (data item 8). The residual $\epsilon_{i,t}$ from equation (8) is the measure of discretionary accruals for firm i in year t.

Following Klein (2002), Cohen et al. (2008) and Hazarika et al. (2012), I use the absolute value of discretionary accruals (*DisAcc*) to detect accrual-based earnings management because corporate executives can use discretionary accruals both to increase or to decrease reported earnings. CEOs can inflate earnings upwards to boost their equity-based compensation (Burns and Kedia, 2006; Efendi et al., 2007) or to mislead certain stakeholders about firm performance when issuing new equity (Friedlan, 1994; Teoh et al., 1998). However, managers also have incentives to deflate reported earnings before re-issuing options (Coles et al., 2006), before share repurchases (Gong et al., 2008), or to strategically time-shift income to show stable growth over time (Hazarika et al., 2012). Taking the absolute value of abnormal accruals allows us to account for attempts to manipulate earnings in both directions.

2.3.3 Control variables

I follow Burns and Kedia (2006) and control for a number of standard firm characteristics that could affect financial reporting behaviour. Firm size (*Size*) is measured as the natural logarithm of market value of equity. Firm age (*Age*) is calculated as the natural logarithm of one plus the number of years since incorporation, and controls

for the potential effects of different firm lifecycle stages. *Leverage* is the long-term debt scaled by total assets, and controls for leverage-based incentives in earnings management. To control for firm performance I use *ROA*, defined as the ratio of earnings before interest and taxes to total assets. I also follow Armstrong et al. (2013) in controlling for other determinants of AAERs, real activities management, and discretionary accruals, including firm capital intensity (*CAPEX*), intangible assets (*Intangibles*), and the size of firms' inventories (*Inventory*) and receivables (*Receivables*). Moreover, Bergstresser and Philippon (2006) and Jiang et al. (2010) suggest that the volatility of a firm's operating environment can affect accruals management and earnings quality, so I control for cash flow volatility (*CFOVol*) and sales volatility (*SalesVol*).

Following Burns et al. (2010) and Biggerstaff et al. (2015), I also control for corporate governance characteristics that could be related to the incidence of accounting fraud and earnings manipulation. Specifically, I use the level of institutional ownership (*InstOwnership*), obtained from the Thomson Financial 13-F database, and the percentage of independent directors (*BoardIndep*), obtained from the ISS database (Beasley, 1996). Moreover, to control for the CEO's equity-based compensation incentives and agency conflicts, I also control for *CEO ownership*, defined as the percentage of total shares (excluding options) owned by a CEO (Biggerstaff et al., 2015). The data for these are extracted from the ExecuComp database. Finally, to proxy for any potential caring effect (i.e., female socialization), I also control for CEOs who have daughters (Cronqvist and Yu, 2017). I include *Daughter* in my regressions, a dummy equal to one for CEOs who have a daughter, and zero otherwise. Data for this are collected from the Marquis Who's Who database.

2.3.4 Descriptive statistics and correlation matrix

Table 1 shows summary statistics and correlations for the variables in my sample. Panel A reports descriptive statistics for my dependent variables. Specifically, 7.4% of the sampled firms commit accounting and financial fraud during my sample window. The average absolute values of abnormal real activities management and discretionary accruals are approximately 1.4% and 1.1% of lagged total assets, respectively. My sample includes 11.5% of CEOs who make stock donations and the average number of times a CEO in my sample donates within a year is 0.346. Also, CEO stock donations on average comprise 1.6% of the total stock owned by CEOs in their firms.

Panel A of Table 2.1 also presents summary statistics for my firm, corporate governance, and CEO incentive variables. In particular, firms in my sample have an average market value of 0.485 billion dollars. Average firm age is approximately 2.5 years. Sample firms have an average leverage ratio of 0.3, return on assets of -1.7%, a capital intensity ratio of 0.263, an intangibles-to-assets ratio of 0.265, and an inventory-to-assets ratio of 0.155. On average, the volatilities of sales and cash flows are about 17.7% and 9.8% over the most recent two years, respectively. My sampled firms also have, on average, 31.6% and 61.5% of total outstanding shares owned by institutional investors and CEOs, respectively. Independent directors account for around 18% of the total number of company directors.

Table 2.1, Panel B provides correlations among the variables in my main tests. Real activities management is significantly and positively correlated with discretionary accruals (0.667), suggesting that some CEOs use both of these methods to alter reported earnings (Cohen et al., 2008; Zang, 2012). I also find significant positive relations

between my donation variables (*DumDonate*, *#Donate* and *DonateRatio*) and my proxies for the level of altruism characterized in CEO stock donations (*NonBackdate* and *NonTaxplanning*), suggesting that CEOs are consistent in their altruism when making stock donations. Further, these altruistic behaviour variables are negatively correlated with all of the earnings management variables, but only have a significant negative correlation with *Fraud*. This suggests that the CEO-altruism effect might be more pronounced in preventing CEOs from committing corporate fraud, the most aggressive form of earnings manipulation.

Table 2.1 Descriptive Statistics and Correlation Matrix

This table presents descriptive statistics and correlations for my dependent variables, main variables of interest, and control variables. The superscripts ᵃ, ᵇ, and ᶜ denote statistical significance at the 1%, 5% and 10% levels, respectively.

	Panel A: Descriptive Statistics			Panel B: Correlation Matrix																			
	Mean	Median	Std. Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Dependent variables																							
(1) *Fraud*	0.074	0.000	0.162	1.000																			
(2) *RealActMan*	1.388	0.452	46.278	0.008	1.000																		
(3) *DisAcc*	1.113	0.114	44.255	0.002	0.667ᵃ	1.000																	
Variables of interest																							
(4) *DumDonate*	0.115	0.000	0.334	-0.877ᶜ	-0.005	-0.005	1.000																
(5) *# Donate*	0.346	0.000	1.617	-0.165ᵃ	-0.003	-0.003	0.607ᵃ	1.000															
(6) *DonateRatio*	0.016	0.000	0.101	-0.124ᵃ	-0.002	-0.003	0.452ᵃ	0.397ᵃ	1.000														
(7) *NonBackdate*	0.029	0.000	0.171	-0.119ᵃ	-0.002	-0.002	0.481ᵃ	0.189ᵃ	0.180ᵃ	1.000													
(8) *NonTaxplanning*	0.051	0.000	0.235	-0.171ᵃ	-0.003	-0.003	0.648ᵃ	0.287ᵃ	0.293ᵃ	0.470ᵃ	1.000												
Primary Controls																							
(9) *Size*	0.485	0.363	0.640	-0.024ᵇ	0.032ᵃ	0.024ᵃ	0.070ᵃ	0.052ᵃ	0.028ᵃ	0.042ᵃ	0.046ᵃ	1.000											
(10) *Age*	2.526	2.565	0.512	-0.093ᵃ	-0.004	0.000	0.075ᵃ	0.041ᵃ	0.032ᵃ	0.107ᵃ	0.051ᵃ	-0.078ᵃ	1.000										
(11) *Leverage*	0.333	0.202	2.697	0.004	0.013ᵃ	0.012ᵃ	-0.016ᵃ	-0.009ᵇ	-0.006	-0.009ᵇ	-0.011ᵃ	0.142ᵃ	-0.014ᵃ	1.000									
(12) *ROA*	-0.017	0.110	5.075	0.005	0.456ᵃ	0.210ᵃ	0.007ᶜ	0.005	0.004	0.005	0.007ᶜ	-0.076ᵃ	0.017ᵃ	-0.051ᵃ	1.000								
(13) *CAPEX*	0.263	0.200	0.217	-0.090ᵃ	-0.013ᵃ	-0.008ᵇ	0.006	0.010ᵃ	-0.003	-0.003	-0.005	-0.155ᵃ	-0.014ᵃ	0.014ᵃ	0.016ᵃ	1.000							
(14) *Intangibles*	0.265	0.022	11.815	-0.007	0.001	0.000	-0.005	-0.002	-0.000	-0.003	-0.002	0.036ᵃ	-0.016ᵃ	0.003	-0.008ᵇ	-0.013ᵃ	1.000						
(15) *Inventory*	0.155	0.118	0.144	-0.002	-0.002	-0.004	-0.010ᵇ	-0.014ᵃ	-0.017ᵃ	-0.013ᵃ	-0.003	-0.091ᵃ	0.032ᵃ	0.010ᵇ	-0.013ᵃ	-0.266ᵃ	-0.012ᵃ	1.000					
(16) *SalesVol*	0.177	0.074	2.110	-0.007	0.008ᵇ	0.007ᶜ	-0.010ᵃ	-0.007ᶜ	-0.005	-0.005	-0.006	0.070ᵃ	-0.023ᵃ	0.190ᵃ	-0.008ᵇ	-0.022ᵃ	-0.001	0.001	1.000				
(17) *CFOVol*	0.098	0.033	0.927	-0.006	0.081ᵃ	0.047ᵃ	-0.015ᵃ	-0.010ᵃ	-0.008ᵇ	-0.010ᵇ	-0.012ᵃ	0.164ᵃ	-0.040ᵃ	0.220ᵃ	0.210ᵃ	-0.039ᵃ	0.012ᵃ	0.009ᵇ	0.537ᵃ	1.000			
(18) *Inst. Ownership*	0.316	0.154	1.468	-0.038ᵃ	-0.003	-0.002	0.041ᵃ	0.026ᵃ	0.019ᵃ	0.029ᵃ	0.026ᵃ	0.002	0.054ᵃ	-0.009ᵇ	0.007ᶜ	-0.003	-0.003	-0.021ᵃ	-0.007ᶜ	-0.013ᵃ	1.000		
(19) *BoardIndep*	0.181	0.000	0.322	-0.058ᵃ	-0.010ᵃ	-0.008ᵇ	0.200ᵃ	0.134ᵃ	0.089ᵃ	0.125ᵃ	0.118ᵃ	0.049ᵃ	0.314ᵃ	-0.023ᵃ	0.019ᵃ	0.032ᵃ	-0.010ᵇ	-0.077ᵃ	-0.024ᵃ	-0.041ᵃ	0.125ᵃ	1.000	
(20) *CEO Ownership*	0.615	0.000	3.025	-0.034ᵃ	-0.003	-0.003	0.124ᵃ	0.096ᵃ	0.037ᵃ	0.062ᵃ	0.068ᵃ	0.025ᵃ	0.046ᵃ	-0.011ᵃ	0.007ᶜ	0.005	-0.004	0.009ᵇ	-0.007ᶜ	-0.013ᵃ	0.022ᵃ	0.141ᵃ	1.000

2.4 CEO Altruism and Corporate Malfeasance in Financial Reporting

2.4.1 Univariate statistics

I first examine mean differences in my corporate malfeasance variables when they are sorted by differences in CEO donations, CEO non-backdating behaviour, and CEO non-tax planning incentives. For my proxies of CEO stock donations, I also sort the means and the mean differences from low to high number of donations in a year and from low to high percentages of stocks donated. Panel A of Table 2.2 shows that firms with donating CEOs are on average 0.2% less likely to commit fraud, and that these firms also have significantly lower probabilities, of around 2.1% and 2.2%, to engage in real activities or to use discretionary accruals earnings, respectively. The univariate results in Panel A (Table 2.2) also show that firms with CEOs who donate more than 2.7% of their stock are 0.5% less likely to commit fraud than firms with CEOs who do not.

Table 2.2, Panel B presents univariate results for differences in my corporate financial reporting malfeasance variables when sorted across my range of CEO non-backdating variables. I find consistent results for all three measures of CEO non-backdating. Specifically, the results show that firms with CEOs who donate without backdating, are less likely to commit fraud, have on average lower absolute values of abnormal real activities management, and are also less likely to engage in discretionary accrual. I replicate the univariate analysis in Panel B for CEOs who avoid tax planning when donating stock. Panel C (Table 2.2) shows that firms with CEOs who donate without regard to their tax-planning incentives have, on average, significantly lower levels of abnormal real activities than firms with CEOs who act in line with their tax incentives. This result is consistent across all three measures of CEO non-tax planning.

Table 2.2 Univariate Statistics

This table presents average values of, and mean differences in, *Fraud*, *RealActMan* and *DisAcc* when sorting them by CEO donations (Panel A), CEO non-backdating on stock donations (Panel B), and CEO non-tax planning (Panel C). T-statistics for differences in mean are shown in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: CEO donations

Sort by	CEOs donate (*DumDonate*)					*Number of Donations* CEO donated in a fiscal year (*#Donate*)					Ratio of shares CEO donated over CEO total shares (*DonateRatio*)				
	No		*Yes*		**Difference**	*0-2 donations*		*> 2 donations*		**Difference**	*0 – 2.7%*		*> 2.7%*		**Difference**
	Mean	*SD*	*Mean*	*SD*	**in mean**	*Mean*	*SD*	*Mean*	*SD*	**in mean**	*Mean*	*SD*	*Mean*	*SD*	**in mean**
Fraud	0.012	0.110	0.010	0.099	0.002** (2.57)	0.012	0.107	0.011	0.104	0.001 (0.55)	0.057	0.231	0.007	0.083	0.050*** (7.32)
RealActMan	3.151	51.641	1.065	11.202	2.086*** (4.25)	3.003	49.810	0.869	5.392	2.134*** (11.72)	3.026	50.255	1.394	16.814	1.632** (2.24)
DisAcc	2.866	96.449	0.684	7.490	2.182** (2.39)	2.708	92.806	0.559	4.295	2.149*** (7.00)	2.741	93.849	0.889	11.231	1.852 (1.36)

Panel B: CEO non-backdating

Sort by	CEOs have all non-backdating stock donations (*NonBackdate*)					CEOs have ≥ 50% of non-backdating stock donations (*1/2NonBackdate*)					CEOs have at least one non-backdating stock donations (*<1/2NonBackdate*)				
	No		*Yes*		**Difference**	*No*		*Yes*		**Difference**	*No*		*Yes*		**Difference**
	Mean	*SD*	*Mean*	*SD*	**in mean**	*Mean*	*SD*	*Mean*	*SD*	**in mean**	*Mean*	*SD*	*Mean*	*SD*	**in mean**
Fraud	0.012	0.108	0.007	0.081	0.005*** (3.12)	0.012	0.108	0.006	0.079	0.006*** (3.73)	0.012	0.109	0.006	0.076	0.006*** (4.36)
RealActMan	2.968	49.444	1.093	11.011	1.874* (1.93)	2.981	49.600	1.031	9.913	1.950** (2.23)	2.989	49.694	1.017	9.486	1.973** (2.37)
DisAcc	2.671	92.159	0.843	7.114	1.828 (1.01)	2.684	92.450	0.776	6.424	1.908 (1.17)	2.693	92.627	0.752	6.107	1.941 (1.25)

Table 2.2 (Continued)

Panel C: CEO non-tax planning

Sort by	CEOs have all non-tax planning incentives in stock donations (*NonTaxplanning*)					CEOs have ≥ 50% of non-tax planning stock donations (*1/2NonTaxplanning*)					CEOs have at least one non-tax planning stock donations (*<1/2NonTaxplanning*)				
	No		*Yes*		*Difference in mean*	*No*		*Yes*		*Difference in mean*	*No*		*Yes*		*Difference in mean*
	Mean	*SD*	*Mean*	*SD*		*Mean*	*SD*	*Mean*	*SD*		*Mean*	*SD*	*Mean*	*SD*	
Fraud	0.012	0.108	0.011	0.103	0.001 (0.69)	0.012	0.108	0.011	0.104	0.001 (0.62)	0.012	0.108	0.011	0.105	0.001 (0.54)
RealActMan	3.004	49.993	1.342	15.624	1.662** (2.37)	3.042	50.417	1.207	13.681	1.835*** (2.97)	3.057	50.578	1.163	13.113	1.894*** (3.19)
DisAcc	2.719	93.342	0.847	10.323	1.872 (1.43)	2.756	94.136	0.766	9.046	1.991* (1.73)	2.771	94.437	0.739	8.677	2.032* (1.84)

2.4.2 Regression analyses

In order to examine the effect of CEO altruism on corporate malfeasance in financial reporting I estimate a series of panel regressions that take the form:

$$Misreporting_{ijkt} = \beta_0 + \beta_1 CEO\ altruism_{jk} + \beta_2 Controls_{ijt} + \phi_k + \phi_t + \epsilon_{ijkt} \quad \textbf{(9)}$$

where *Misreporting* is one of three measures of corporate malfeasance in financial reporting (i.e. *Fraud*, *RealActMan*, or *DisAcc*), *i* indexes firms, *j* indexes CEOs, *k* indexes industries, and *t* indexes years. *CEO altruism* is one of five measures of altruistic behaviour reflected in stock donations (i.e. *#Donate*, *DumDonate*, *DonateRatio*, *NonBackdate*, or *NonTaxplanning*). *Controls* is a vector of standard firm characteristics, corporate governance characteristics and CEO incentives, ϕ are sets of industry and year fixed effects, and ϵ is an error term. That is, the model compares firms across CEO altruism for firms in the same industry and year, and with similar firm characteristics and CEO compensation incentives. Standard errors are heteroskedasticity-robust (White, 1980) and clustered by industry and year to confront time-series correlation affecting the CEO-altruism effect. I also winsorize all explanatory variables and controls at the 99th percentile.

Table 2.3 reports estimates from equation (9) when using the number of times a CEO made stock donations (*#Donate)* to measure CEO altruism as my primary explanatory variable. I find a significant negative relation between *#Donate* and all three measures of financial reporting malfeasance. The estimated coefficient of *Fraud* in the probit regression (model 1) indicates that the probability of fraud is significantly lower, on

average, by approximately 41.3% (t-statistic = -5.79) when the number of CEO stock donations increases by one standard deviation in a given year.

Table 2.3 also shows that the absolute values of abnormal real activities and discretionary accrual-based management are also significantly lower, by approximately 0.195% (t-statistic = -2.53) and 0.155% (t-statistic = -2.63) of lagged total assets, respectively, when the number of donations by a CEO increases by one standard deviation in a given year (models 2 and 3). These decreases are about 14% of the average absolute values of both abnormal real activity management and discretionary accruals for firms in my sample. Overall, my results are consistent with the first hypothesis, and the related sub-hypotheses: firms with CEOs who have personal altruistic preferences are less likely to be subject to SEC AAERs, and have lower levels of earnings manipulation than firms with CEOs who have no altruistic preference.

Table 2.3 CEO Stock Donations and Corporate Malfeasance in Financial Reporting

This table presents regression results for the effects of *#Donate* on *Fraud*, *RealActMan* and *DisAcc*. I include industry and year fixed effects in all of the models. For definitions of the variables in the table see the Appendix. Standard errors are clustered by two-digit SIC industry and year, and t-statistics are reported in parentheses.

*, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable of interest	*Fraud*	*RealActMan*	*DisAcc*
	(1) Probit	**(2)** OLS	**(3)** OLS
#Donate	-0.155***	-0.120**	-0.096***
	(-5.79)	(-2.53)	(-2.63)
Controls			
Size	0.000	2.789**	1.773**
	(0.01)	(2.35)	(2.00)
Age	-0.156***	-0.241	0.044
	(-3.35)	(-0.72)	(0.22)
Leverage	0.107***	0.036	0.075
	(2.70)	(0.21)	(0.60)
ROA	0.004	4.686	2.082
	(1.18)	(1.45)	(0.77)
CAPEX	-0.837***	-4.422***	-0.838

	(-5.49)	(-2.61)	(-0.66)
Intangibles	-0.378***	0.007	0.004*
	(-3.22)	(1.61)	(1.80)
Ln (Operating cycle)	0.155***	-1.071**	-1.014*
	(3.93)	(-2.17)	(-1.82)
Inventory	-0.485**	3.574*	1.227
	(-2.27)	(1.91)	(0.87)
Receivables	-0.668***	0.725	4.678
	(-3.03)	(0.23)	(1.37)
SalesVol	-0.094	-2.760*	-1.262
	(-0.84)	(-1.75)	(-1.16)
CFOVol	-1.044**	12.364*	5.856
	(-2.56)	(1.76)	(1.24)
Inst. Ownership	1.687***	-0.079	-0.066
	(17.00)	(-1.30)	(-1.35)
BoardIndep	-0.270***	-1.595**	-1.147**
	(-2.58)	(-2.56)	(-2.28)
CEO Ownership	0.007	-0.049**	-0.034**
	(0.99)	(-2.46)	(-2.15)
Daughter	0.264***	-0.465**	-0.300**
	(2.83)	(-2.49)	(-2.03)
Constant	-1.619***	5.452*	2.986
	(-6.85)	(1.76)	(0.88)
Number of observations	18,830	66,583	66,583
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Adjusted/ Pseudo R^2	0.206	0.256	0.057

Table 2.4 presents results on corporate financial reporting malfeasance as a function of CEO non-backdating behaviour (*NonBackdate*), CEO non-tax planning (*NonTaxplanning*), and the interaction of *Nonbackdate and NonTaxplanning*. The results provide strong support for my second hypothesis that higher levels of altruism are associated with more pronounced reductions in corporate financial reporting malfeasance. Specifically, Table 2.4 shows that the coefficients of *NonBackdate* and *NonTaxPlanning* on *Fraud* are negative and statistically significant (t-statistics of -5.66 and -5.94), indicating that the probability of fraud is 68.5% and 47.6% lower in firms with CEOs who do not backdate or take into consideration their personal tax planning

incentives, respectively (models 1 and 2). The coefficient on the interaction term *Non-(Backdate & Taxplanning)* is also statistically significant (t-statistic = -4.15, model 3). The interaction effect between CEO non-backdating and non-tax planning incentives is significant and negatively associated with a 58.1% reduction in the likelihood of firms being subject to an SEC AAER. These results suggest that the effects of *NonBackdate* and *Nontaxplaning* are more pronounced than the effect of increased stock donations in reducing the probability of fraud.

I obtain similar results in all regressions of real activities manipulation (models 4-6) and discretionary accruals (models 7-9) in Table 2.4. Specifically, in models 4 to 6, abnormal real activities management decreases, on average, by approximately 0.162%, 0.142%, and 0.174% of lagged total assets, respectively, when the number of times a CEO donates in a year increases by one standard deviation. These figures are additionally lower, on average, by about 1.149%, 0.836%, and 1.260% of lagged total assets, for CEOs not involved in either backdating or tax planning, or both, respectively. These additional effects are sizeable, and are an approximate decrease of 82.8%, 60.2%, and 90.7%, respectively, when compared to the average *RealActMan* of 1.388% for firms in my sample. Similar results are obtained when regressing against discretionary accruals in models 7 to 9.

In summary, the results show that reductions in real activities and accruals-based earnings management are more elevated for CEOs who are both unlikely to backdate and to plan around their personal tax incentives. Further, the findings also suggest that donating CEOs who either do not backdate, or do not plan for the tax implications of donating, are linked with greater reductions in the probability of fraud, real activities and accruals earnings manipulation.

Table 2.4 Non-Backdating and Non-Tax Planning Behaviours in CEO Stock Donations

This table presents regression results for the additional effects of *NonBackdate*, *NonTaxplanning,* and *Non-(Backdate & Taxplanning)* in CEO stock donations on *Fraud* (models 1-3), *RealActMan* (models 4-6), and *DisAcc* (models 7-9). See the Appendix for the definitions of these variables. I include same controls (used in Table 2.3) and industry and year effect fixed effects in all models. Standard errors are clustered by two-digit SIC industry and year, and t-statistics are reported in parentheses.

*, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable of interest	Fraud			RealActMan			DisAcc		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
#Donate	-0.154***	-0.147***	-0.155***	-0.100**	-0.088**	-0.108**	-0.080***	-0.071**	-0.086***
	(-5.89)	(-5.91)	(-5.85)	(-2.46)	(-2.41)	(-2.51)	(-2.59)	(-2.58)	(-2.62)
NonBackdate	-0.685***			-1.149***			-0.882***		
	(-5.66)			(-2.59)			(-2.65)		
NonTaxplanning		-0.476***			-0.836***			-0.634***	
		(-5.94)			(-2.70)			(-2.68)	
Non-(Backdate & Taxplanning)			-0.581***			-1.261**			-0.973**
			(-4.15)			(-2.47)			(-2.56)
Constant	-1.648***	-1.570***	-1.626***	5.420*	5.492*	5.437*	2.962	3.017	2.975
	(-6.95)	(-6.59)	(-6.87)	(1.74)	(1.77)	(1.75)	(0.88)	(0.89)	(0.88)
Number of observations	18,830	18,830	18,830	66,583	66,583	66,583	66,583	66,583	66,583
Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted/ Pseudo R^2	0.216	0.217	0.211	0.256	0.256	0.256	0.057	0.057	0.057

Table 2.5 shows results from using my alternative measures of CEO stock donations (*DumDonate* and *DonateRatio*). I replicate all regressions from Table 2.4 but substitute a dummy for CEO stock donations in Panel A and a ratio of stock donated over total stock owned in Panel B. Panel A shows that the coefficients of *DumDonate* are negative and statistically significant at the 1% level against all three measures of corporate financial malfeasance (models 1, 5 and 9). This indicates that firms with altruistic CEOs are, on average, less likely to commit fraud by 157.3%, and less likely to engage in real activities and accrual-based management by approximately 62.1% and 59.2%, respectively, than firms whose CEO has not donated stock.

My results further suggest that the estimated additional effects of CEO non-backdating and CEO non-tax planning on real activities management are associated with significant reductions of 50.6%, 27.9% and 55.8% across models 6, 7 and 8, respectively. Similarly, discretionary accruals decrease on average, by approximately 48.6%, 26.9%, and 54.5% for CEOs who do not engage in backdating, tax planning, or a combination of both, respectively (see models 10-12). In addition, I also find that while the probability of fraud is lower by about 28.1% (t-statistic = -2.11) for CEOs who do not backdate donations (model 2), I also find no evidence of a corresponding negative effect of *NonTaxplanning* (model 3), or of the combined effect of *Non-(Backdate & NonTaxplanning)* (model 4).

Table 2.5, Panel B presents my coefficient estimates of *DonateRatio*, which are negative and significant at the 1% level for all three measures of earnings manipulation (models 1, 5 and 9). This indicates a consistently negative relationship between the ratio of stock donated by CEOs and the likelihood of committing fraud and other earnings manipulations. Furthermore, when using *DonateRatio* as an alternative measure of CEO

altruism alongside measures for the additional effects of CEO non-backdating (*NonBackdate)* and CEO non-tax planning (*NonTaxplanning)*, I also find that higher levels of personal altruism are significantly associated with additional reductions in the probabilities of fraud (models 2-4), real activities management (models 6-8), and discretionary accruals manipulation (models 10-12).

Collectively, the results in Table 2.5 are consistent with my results using *#Donate* as the primary measure of CEO altruism. In summary, I document that all three levels of corporate financial reporting malfeasance decrease significantly in firms run by CEOs with altruistic preferences. Furthermore, I find evidence to suggest that the negative effect of CEO altruism on corporate financial reporting malfeasance likely amplifies for more altruistic CEOs.

Table 2.5 Dummy and Ratio Treatments of CEO Stock Donations

This table presents robustness checks of the results reported in Tables 3 and 4 by examining two alternative proxies of CEO stock gifts. Panel A shows regression results for the effects of *DumDonate*, and *NonBackdate*, *NonTaxplanning,* and *Non-(Backdate & Taxplanning)* on *Fraud* (models 1-4), *RealActMan* (models 5-8), and *DisAcc* (models 9-12). Similarly, Panel B shows regression results for the effects of *DonateRatio,* and *NonBackdate*, *NonTaxplanning,* and *Non-(Backdate & Taxplanning)*. See the Appendix for definitions of these variables. I include controls, industry and year fixed effects in all models for both panels. Standard errors are clustered by two-digit SIC industry and year, and t-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: Dummy of CEO stock donations

Variable of interest	Fraud				RealActMan				DisAcc			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
DumDonate	-1.573***	-1.534***	-1.643***	-1.556***	-0.862***	-0.696**	-0.683**	-0.741**	-0.659***	-0.530***	-0.522**	-0.565***
	(-11.37)	(-11.31)	(-11.54)	(-11.32)	(-2.61)	(-2.43)	(-2.25)	(-2.54)	(-2.70)	(-2.59)	(-2.50)	(-2.67)
NonBackdate		-0.281**				-0.703**				-0.548**		
		(-2.11)				(-2.10)				(-2.28)		
NonTaxplanning			0.152				-0.387*				-0.299*	
			(1.53)				(-1.69)				(-1.88)	
Non-(Backdate & Taxplanning)				-0.182				-0.774**				-0.607**
				(-1.20)				(-2.06)				(-2.24)
Constant	-1.530***	-1.545***	-1.538***	-1.535***	5.504*	5.472*	5.510*	5.486*	3.025	3.001	3.030	3.011
	(-6.17)	(-6.23)	(-6.22)	(-6.20)	(1.78)	(1.77)	(1.78)	(1.77)	(0.89)	(0.89)	(0.90)	(0.89)
Number of observations	18,830	18,830	18,830	18,830	66,583	66,583	66,583	66,583	66,583	66,583	66,583	66,583
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted/ Pseudo R^2	0.277	0.279	0.278	0.278	0.256	0.256	0.256	0.256	0.057	0.057	0.057	0.057

Table 2.5 (Continued)

Panel B: Ratio of CEO stock donated over CEO total shares

Variable of interest	Fraud				RealActMan				DisAcc			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
DonateRatio	-2.028***	-1.867***	-1.799***	-1.934***	-1.296**	-0.955**	-0.742**	-1.040**	-0.964**	-0.698**	-0.518**	-0.759**
	(-3.21)	(-3.19)	(-3.17)	(-3.17)	(-2.47)	(-2.35)	(-2.18)	(-2.43)	(-2.47)	(-2.30)	(-2.10)	(-2.39)
NonBackdate		-0.638***				-1.231**				-0.960***		
		(-5.63)				(-2.57)				(-2.67)		
NonTaxplanning			-0.449***				-0.905***				-0.727***	
			(-6.03)				(-2.67)				(-2.77)	
Non-(Backdate & Taxplanning)				-0.510***				-1.322**				-1.058***
				(-3.81)				(-2.44)				(-2.61)
Constant	-1.587***	-1.627***	-1.556***	-1.599***	5.537*	5.494*	5.558*	5.513*	3.050	3.017	3.068	3.031
	(-6.56)	(-6.72)	(-6.36)	(-6.60)	(1.78)	(1.76)	(1.79)	(1.77)	(0.90)	(0.89)	(0.90)	(0.89)
Number of observations	18,145	18,145	18,145	18,145	65,597	65,597	65,597	65,597	65,597	65,597	65,597	65,597
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted/ Pseudo R^2	0.201	0.210	0.210	0.205	0.256	0.256	0.256	0.256	0.057	0.057	0.057	0.057

2.4.3 Transitioning firms

I acknowledge that my baseline results are subject to endogeneity concerns. One potential problem is that there could be some unobservable factors which may increase the risk of spurious correlation between CEO altruism and the levels of corporate financial reporting malfeasance I observed. To address this issue, I conduct transition analysis by comparing new and departing CEOs with different altruistic preferences running the same firm. I also control for time-invariant firm characteristics that may be correlated with omitted explanatory variables by including firm fixed effects.

In the transition analysis, my sample only includes firms which experience a turnover from a CEO who is more likely to donate stock (an altruistic CEO), to a CEO who is less likely to donate stock (a non/less-altruistic CEO), or vice versa. My panel regression model of transitioning firms is as follows:

$$Misreporting_{ijkt} = \beta_0 + \beta_1 DonateCEO_{jk} + \beta_2 Controls_{ijt} + \phi_j + \phi_k + \phi_t + \epsilon_{ijkt} \quad (\mathbf{10})$$

where *DonateCEO* is a dummy equal to one for CEOs (i) who have a track record of donating stock for at least half of their years in CEO tenure,[13] and (ii) who experience a CEO turnover event. I use the same control set as in my regressions of equation (9). I include firm fixed effects together with year fixed effects. The standard errors are heteroskedasticity robust and clustered by firm and year.

Table 2.6 presents my results for the effects of CEO altruism on *Fraud*, *RealActMan* and *DisAcc* when firms experience a change from a more to a less altruistic CEO, or vice

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[13] I only include CEOs whose tenure is greater than one year.

versa. The results show that the probability of fraud remains statistically significant at the 1% level for this cohort, and furthermore that it is lower by an estimated 2.6% for firms run by more altruistic CEOs, after controlling for differences in firm characteristics, corporate governance and CEO incentives, as well as for industry, firm and year fixed effects (model 1). Similarly, when regressing against *RealActMan* and *DisAcc*, I find that real activities management and discretionary accruals for transitioning firms, on average, are estimated to decrease by 4.7% and 16.3%, respectively (models 2 and 3).[14]

Table 2.6 CEO Turnover and Corporate Malfeasance in Financial Reporting

This Table reports panel regression results for the effect of CEO donations when there is a CEO turnover on *Fraud* (model 1), *RealActMan* (model 2) and *DisAcc* (model 3). I include industry, firm and year fixed effects in all models. See the Appendix for definitions of all variables in the table. I also include same controls (used in Table 2.3) in all models. Standard errors are clustered by firm and year, and t-statistics are reported in parentheses. In this analysis, I include only firms that experience CEO turnover from a CEO more likely to donate, to a CEO less likely to donate, or vice versa.

*, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable of interest	*Fraud*	*Real ActMan*	*DisAcc*
	(1)	**(2)**	**(3)**
DonateCEO	-0.026***	-0.028*	-0.077**
	(-3.23)	(-1.86)	(-2.31)
Number of observations	2,918	5,791	5,791
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Adjusted R^2	0.374	0.421	0.180

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[14] My sub-sample of transitioning firms has mean absolute values of real activities management and abnormal accruals of 0.623% and 0.471% of lagged total assets, respectively.

2.4.4 Propensity score matching analysis and Difference-in-difference models

To further address this concern, I use different-in-differences (DiD) models to evaluate the impact of a treatment effect (a replacement a non/less-altruistic CEO with an altruistic CEO[15]) on corporate financial reporting malfeasance, compared to control firms (those which experience a CEO turnover from a non/less-altruistic to another non/less-altruistic CEO).[16] The treatment group includes firms experiencing the transition from a non/less altruistic to a more altruistic CEO. Specifically, I compare differences in corporate financial reporting malfeasance between treated and control firms from the pre-turnover to the post-turnover period. The advantage of the DiD approach is to mitigate potential biases in the post-turnover comparisons between the treated and control firms that may result from unobservable time-invariant differences between those firms at the pre-turnover period, as well as biases from the before-and-after comparisons in the treated firms that may be the result of omitted time-variant variables.

To mitigate any heterogeneity in firm characteristics, I employ a propensity score matching approach to pair-match each treated firm with a control firm that experiences a CEO turnover from a non/less-altruistic CEO to a non/less-altruistic CEO during the sample period. Propensity scores are estimated within industry-year categories, using all

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[15] In the empirical analysis of CEO turnovers, I define an *altruistic CEO* as a more-likely donating stock CEO who has a track record of donating stock for at least half of their years in CEO tenure (greater than one year), and a *non/less-altruistic CEO* as a less-likely donating CEO who has a track record of donating stock for less than a half of their years in CEO tenure.

[16] For the sub-sample of firms experiencing a CEO turnover from altruistic to non/less-altruistic CEOs, I find a significant increase in the probability of fraud and accrual-based earnings management. However, I do not have enough control firms (i.e., firms always run by altruistic CEOs) from the same industry and year to undertake a propensity score analysis using the matching approach described here.

firm characteristics, corporate governance, and CEO incentives variables included in my regression analyses. I set the difference between the propensity scores of firms run by altruistic CEOs and matched peers to not exceed 0.1% in absolute value.

Table 2.7 presents the average values, differences in means between the treated and control firms, and the differences in *Fraud, RealActMan* and *DisAcc* between the pre- and post-CEO turnover period for my sample. During the post-CEO turnover period, transitioning firms which move from non/less-altruistic to altruistic CEOs experience lower average rates of real activities and accruals management, at 34.7% and 37.4% respectively, relative to control firms without a CEO transition from a non/less altruistic CEO to an altruistic CEO. The estimated differences in real activities and accruals management from the prior to the post-turnover period between the treated and control firms are both negative and statistically significant (t-statistics of 1.65 and 2.71, respectively), indicating that the treatment effect (a replacement a non/less-altruistic with an altruistic CEO) decreases real activities management and discretionary accruals, on average, by approximately, 11% and 15.2%, respectively, when compared to the average values of real activities and accruals management of firms in my sample. My conclusions remain qualitatively the same when I examine the change in the probability of fraud. These results therefore provide additional evidence of changes in corporate malfeasance around CEO turnover events with a replacement a non/less-altruistic with an altruistic CEO.

Table 2.7 PSM and Difference-in-Differences Models for Transitioning Firms

In this Table, I use propensity score matching and difference in differences approaches to evaluate the treatment effect of a replacement of an altruistic CEO (a more-likely donating CEO) for a non/less-altruistic CEO (a less-likely donating CEO), on *Fraud*, *RealActMan* and *DisAcc*. I identify control samples of firms (those which experience a CEO turnover from a non/less altruistic CEO to another non/less-altruistic CEO) by employing a propensity score matching procedure. Propensity scores are estimated within industry-year categories, using all firm characteristics, corporate governance variables, and CEO incentives controls included in my regression analyses. The treatment group in this table includes firms experiencing a transition from a non/less-altruistic CEO to an altruistic CEO. I set the difference between the propensity scores of firms run by CEOs more likely to donate and matched peers to not exceed 0.1% in absolute value. See the Appendix for definitions of the variables in the table. T-statistics are reported in parentheses.

*, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable of interest	*Fraud*			*RealActMan*			*DisAcc*		
	N	Mean	Difference (T-C)	N	Mean	Difference (T-C)	N	Mean	Difference (T-C)
Before CEO turnovers									
Control group (less-likely donating CEOs)	2,096	0.084	-0.015**	6,127	0.365	-0.021	6,127	0.038	0.097***
Treatment group (less-likely donating CEOs)	877	0.069	(-2.38)	1,461	0.344	(-0.71)	1,461	0.135	(2.47)
After CEO turnovers									
Control group (less-likely donating CEOs)	1,620	0.087	-0.083***	6,038	0.496	-0.173**	6,038	0.195	-0.073*
Treatment group (more-likely donating CEOs)	1,161	0.004	(7.84)	1,332	0.324	(2.33)	1,332	0.122	(1.72)
Difference in Differences	5,754		-0.068*** (5.74)	14,958		-0.152* (1.65)	14,958		-0.169*** (2.71)

2.4.5 Two-stage least squares and CEO child-caregiving activities

One additional concern is that my results might be subject to simultaneity bias in that my dependent variables (fraud, real activities and accruals management) may affect my primary explanatory variable (CEO stock donations) in the baseline regressions. The simultaneous causality may potentially arise because CEOs may donate more stocks when they manipulate earnings to be high such that the stock price goes up and CEOs gain their personal tax benefits from their donations of appreciated stocks. To address this endogeneity issue, I use two-stage least squares (2SLS) regressions to test the robustness of my results. The first-stage consists of a probit regression which models the probability of CEOs making stock donations through the use of an instrumental variable (IV). In the second-stage, I regress the dependent variables *Fraud, RealActMan* and *DisAcc* on the predicted probability of making stock donations estimated from the first-stage probit regressions.

The attachment theory of Ainsworth et al. (1978) and Bowlby (1982) defines altruism as caregiving behaviour, or the provision of care, support and protection to dependent others in response to their needs, especially infants and young children. I rely on this theory to construct a dummy for CEOs engaging in child-caregiving activities (*Childcare)*, and use this as my IV. I argue that this IV meets the relevancy condition for an IV because it can be correlated with personal altruistic behaviour (Ainsworth et al., 1978; Bowlby, 1982; Mikulincer et al., 2005). Furthermore, it meets the exclusion condition because there is no reason to expect that managerial influence on corporate financial malfeasance will lead to greater or lesser involvement in child-caregiving activities for CEOs.

Table 2.8 reports the estimated results from my 2SLS regressions of corporate malfeasance with a dummy endogenous variable (*DumDonate*) and a dummy IV (*Childcare*).[17] In the first-stage probit regressions (models 1, 3 and 5), the coefficients on *Childcare* are statistically significant and positive across all models (at the 1% and 5% levels), indicating that the probability of a CEO donating stock is positively correlated with the probability of engaging in child-caregiving activities. The results in the second-stage regressions show a significantly negative relationship between the predicted probability of making stock donations and corporate malfeasance at all three levels of financial reporting: *Fraud* (model 2), *RealActMan* (model 4), and *DisAcc* (model 6).

In summary, these findings provide strong support that the negative effect of CEO-altruism on all three levels of corporate financial reporting malfeasance is robust after controlling for potential endogeneity in my original estimations.

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[17] I reject the null hypothesis that the IV (*Childcare)* is weakly correlated with the endogenous regressor because the Cragg-Donald Wald F-test statistic is statistically significant and exceeds the Stock-Yogo IV critical value of 16.38 for single endogenous regressor at 10 percent relative bias (F = 169.98, p = 0.000) (Cragg and Donald, 1993; Stock and Yogo, 2005).

Table 2.8 Two-Stage Least Squares and CEO Child-Caregiving Activities

This table reports two-stage least squares (2SLS) regressions with a dummy endogenous variable *DumDonate*, and a dummy instrumental variable (IV) *Childcare*. The first-stage probit model shows the probability of CEOs having stock donations as a function of engaging in child-caregiving activities (*Childcare*). The second-stage regressions present the treatment effects on *Fraud*, *RealActMan* and *DisAcc*. In all models, I include same controls (used in Table 2.3) and industry and year fixed effects. See the Appendix for definitions of the variables in this table. Standard errors are clustered by two-digit SIC industry and year, and t-statistics are reported in parentheses.

*, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

	Fraud		*RealActMan*		*DisAcc*	
2SLS	(1) 1st stage	(2) 2nd stage	(3) 1st stage	(4) 2nd stage	(5) 1st stage	(6) 2nd stage
Variable	*DumDonate*	*Fraud*	*DumDonate*	*RealActMan*	*DumDonate*	*DisAcc*
DumDonate		-0.501***		-40.797***		-36.398**
		(-4.20)		(-2.73)		(-2.39)
IV: Childcare	7.245***		0.142**		0.142**	
	(27.35)		(2.03)		(2.03)	
Number of observations	21,614	21,614	67,417	66,583	67,417	66,583
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

2.5 Summary and Conclusion

The study in this chapter examines whether the personal altruism of corporate CEOs is related to corporate malfeasance in financial reporting, including fraud, manipulation of real activities, and accrual-based earnings management. I find that firms run by altruistic CEOs, who donate portions of their stock holdings, are less likely to be the subject of SEC fraud investigations, and exhibit lower levels of real activities and accrual-based earnings manipulation. Furthermore, I find that CEOs who donate without self-interested fiscal preferences, such as backdating donations or donating in line with tax planning incentives, demonstrate higher levels of altruism. My results provide strong

support that more altruistic CEOs are associated with firms which experience greater reductions in the probability of fraud and other financial reporting malfeasance.

While corporate financial reporting is a natural starting point, I suspect that CEO altruism also might influence other corporate financial policies (e.g. M&A, investment strategy, and employee compensation policies). This seems particularly relevant given that altruistic executives are often faced with difficult decisions requiring trade-offs between monetary incentives and altruistic motivations. Future research can therefore examine the interplay between CEO altruism and other factors which can influence CEO decision making. This would also have implications for firms hiring altruistic CEOs to maximize corporate value and reduce any potential losses from corporate financial reporting malfeasance.

CHAPTER 3

POTENTIAL MEASUREMENT ERROR OF CEO ALTRUISM AND AN EXTENSION TO THE READABILITY OF FINANCIAL REPORTS

3.1 Introduction

Chapter Three presents two-way extensions of the first study in the previous chapter. The first extension focuses on addressing potential measurement error of CEO altruism. The second part of this chapter extend the research on the CEO-altruism effect on the readability of a firm's annual financial report.

A potential endogeneity may raise that the estimated results in the first study might be biased because of CEO stock donations may not completely capture personal altruistic behaviours of CEOs. To address the potential measurement error of CEO altruism, the first extended study in this chapter explores other five alternative measures of personal altruism of CEOs other than using a primary proxy of CEO stock donations. Motivated psychological literature and prior studies on timing stock options (Yermack, 1997; Ofek and Yermack, 2000; Lie, 2005), I observe CEO personal philanthropic activities in society (i.e., CEOs have received humanitarian awards), other types of CEO charitable donations (i.e., CEO personal charitable cash donations), and other potential opportunistic incentives when CEOs make donations including stock donations (i.e., CEOs may donate stocks to their family charitable foundations, or CEOs may exploit insider information by well-timing their stock donations at a favourite time of earnings

announcements, or CEOs may donate stocks after receiving a significantly large value of stock awards to actively rebalance their wealth portfolio). These alternative proxies are constructed by employing hand-collecting data from unique data sources that I describe in more details in each sub-sections of Section 3.2. The overall results suggest that CEO personal altruism has a positive effect on diminishing various forms of corporate malfeasance in financial reporting, after controlling for potential endogenous measurement error of CEO altruism. This extended study not only provides additional robustness evidence for the findings in the first study, but also contributes to the literature various empirical approaches to identify and measure properly personal managerial altruism of executives.

The second extended study investigates the effect of CEO altruism on the readability of a firm's financial report. This study extends the previous research by examining additional form of corporate financial reporting which may be associated with the least serious risks and costs of misreporting, compared to corporate fraud, real activities and accruals earnings manipulation. Despite the least serious level of financial reporting readability, prior studies suggest that firm managers may use complex words and an opaque disclosure in financial statements to obfuscate poor financial performance which may lead to shareholders' serious financial misunderstanding and corporate losses (Bloomfield, 2008; Li, 2008; Lo et al., 2017; Xu et al., 2018). This extended study is necessary to provide a wide-ranging empirical analysis of the impact of CEO altruism on all forms of corporate financial reporting misconduct from corporate fraud to the poor readability of financial reports. The estimated results reveal that firms led by altruistic CEOs produce more comprehensive financial reports than firms with non-altruistic CEOs. Moreover, the CEO-altruism effect on the improvement in the financial reporting readability is more pronounced when CEOs make stock donations without having

personal financial motives (including non-backdating and non-tax planning incentives in gifting stocks). This study is the first to highlight the impact of CEO altruism on improving the readability of a firm's financial reports. This extended study together with my previous findings in the first study in Chapter Two, contribute to the literature an ample understanding of the positive effect of CEO altruism on diminishing corporate malfeasance in financial reporting in various forms from most serious (corporate fraud), to intermediate (real activities manipulation), to least serious (accruals-based earnings), and to extremely least serious (the poor readability of financial reports).

The rest of this chapter is structed as follows. Section 3.2 presents this first extended study that addresses potential measurement error of CEO altruism. Section 3.3 provides a research extension on the readability of a firm's financial reports. Section 3.4 concludes.

3.2 Potential Measurement Errors of CEO Altruism

3.2.1 Alternative psychological measure of CEO altruism

A further concern with my estimations is that CEO stock donations may not completely capture personal managerial altruism and hence my results might be subject to measurement error. To address this concern, I follow prior studies on psychology and construct a dummy capturing whether CEOs have received humanitarian awards for their charitable contributions (*Humani).* I use this variable as an alternative measure of CEO altruism because it highlights CEO personal philanthropy in society. Data for this are obtained from the Marquis Who's Who database.

Using this new measure, I examine corporate malfeasance as a function of CEO altruism by again employing a propensity score matching approach. The *Humani* treated

sample includes firms with CEOs who have received a humanitarian award. For each such firm in the treatment group, I find a matching control firm that has comparable firm characteristics, corporate governance, and CEO ownership, but does not have a CEO who has received a humanitarian award. This analysis allows us to identify a control sample of firms that are run by non-altruistic CEOs, but that exhibit no observable differences relative to firms run by altruistic CEOs.

Table 3.1 reports average treatment effects on the treated (ATET) results of *Humani* on *Fraud, RealActMan* and *DisAcc*. The results reveal that real activities and accrual management in firms with awarded CEOs are, on average, 35.6% and 50.8% lower, respectively, than in firms with CEOs who have not been awarded. The coefficients on these differences are statistically significant at the 10% and 5% levels, respectively. However, I find no evidence of a significant difference in the likelihood of fraud between the matched firms.

Table 3.1 Propensity Score Matching on Psychological Measure of CEO Altruism

This table reports average treatment effects on the treated (ATET). I examine the treatment effects of *Humani* on *Fraud, RealActMan* and *DisAcc*. The *Humani* treated sample includes firms with CEOs who have received a humanitarian award. For each such firm in the treatment group, I find a matching control firm that has comparable firm, corporate governance, and CEO characteristics, but whose CEO has not received a humanitarian award. See the Appendix for definitions of the variables in this table. T-statistics are reported in parentheses.
*, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable of interest	CEO received humanitarian award *(Humani)*		
	Treated (Yes)	Controls (No)	ATET (T-C)
Fraud	0.071	0.048	0.023 (0.46)
RealActMan	0.536	0.832	-0.296* (-1.87)
DisAcc	0.279	0.567	-0.288** (-2.07)

3.2.2. CEO stock donations to charitable recipients

One concern with my primary proxy of CEO altruism is that CEOs may donate stocks to family foundations or family trusts (Yermack, 2009). In this case, stock donations are less likely to reflect CEO altruism. To address this concern, I further consider the recipients of stock donations by classifying two types of donees of CEO stock gifts. Stock gifts made by CEOs can be charitable contributions to external charitable foundations, or family stock gifts to CEOs' family members, family trust funds and other CEO-related entities. Depending on the motivations of philanthropic CEOs, stock donations are gifted to external charitable foundations to improve community well-being and social welfare (Yermack, 2009). In contrast, family stock gifts may involve executives' estate planning considerations and their tax savings incentives on capital gains and thus more likely be opportunistic rather than altruistic (Jung and Park, 2009; Yermack, 2009; Brown et al., 2017).[18] As such, stocks gifted to external charitable foundations are expected to reflect CEO altruism more genuinely than stocks gifted to a CEO's family charitable trust or foundation.

I create a dummy variable, *Charitable Recipients,* to indicate whether the recipients of CEO stock donations are external charitable organizations. I utilize the data of stock donations made by CEOs, compiled from the Form 4 and Form 5 SEC filings in the Thomson Financial Insider Trading database. Following the methodology in Yermack

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[18] Jung and Park (2009) and Brown et al. (2017) find that CEOs with estate planning incentives, time the stock gifts to family members at the relative minimum stock price. The fair market value of stock gifts at the time of gifting, rather than the expected higher future stock price, will be counted for the estate tax base. Since the value of the taxable estate stock gifts will be "frozen" at a depressed price for the CEOs remaining lifetime period, CEOs thus can gain an economically significant estate tax savings and net family tax savings overall.

(2009), I hand-collect the footnotes information[19] of each of these transactions from the original electric SEC filings of Form 4 and Form 5 on the SEC's EDGAR Internet portal. To eliminate selection bias, I exclude all observations prior to 30 June 2003, the date on which the SEC officially began requiring electronic posting of SEC filings of Forms 4 and 5. In cases where it is not clear how to classify the nature of the relationship between recipient foundations and donors, I search for further information using the Internal Revenue Service (IRS) Form 990-PF and Form 990 filings from the Foundation Center and Guidestar.org internet databases. I exclude all observations that have no footnote or indeterminate information on stock recipients. To avoid double-counting stock gifts, I also drop duplicated observations of amended gift transactions or same gifts reported more than once. For CEOs who gift more than once in a year, I define *Charitable Recipients* as a dummy equal to one if at least one of stock donations is gifted to external charitable organizations, and zero otherwise. This filtering leaves us with a final sample comprised of 4,247 firm-year observations.

Using *Charitable Recipients* as my new measure of CEO altruism, I replicate my baseline regressions to examine the CEO-altruism effect on corporate malfeasance in financial reporting. Further, to mitigate the effect of heterogeneity in time-invariant characteristics on my panel regressions, I employ the entropy balancing (EB) approach (Hainmueller, 2012) to match treatment firms with CEOs who make stock donations to external charitable organizations with control firms run by CEOs who only make family

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[19] The footnotes in Form 4 and Form 5 SEC filings present additional information about the nature of insider trading transactions such as who receives stock transfers, the relationship between stock owners and stock receivers, the nature of stock ownership before and after stock transfers. However, such information in the footnotes is voluntary to report.

stock gifts.[20] The entropy covariate balance is estimated using all firm characteristics, corporate governance and CEO incentives variables included in my regression analyses. I set the balance constraints for all the covariates to the highest covariate moment so that the means, variances and skewness in the reweighted control group data match those from the treatment group.

Table 3.2 presents the estimated results for the effects of *Charitable Recipients* on corporate malfeasance in financial reporting *Fraud¸ Selectman* and *DisAcc*. The estimated coefficients of *RealActMan* and *DisAcc* are negative and statistically significant at the 10% and 5% levels (t-statistics of -1.83 and -1.99), indicating that treatment firms with CEOs that donate stocks to external independent charitable organisations experience absolute values of real activities management and discretionary accruals, on average, 0.531% and 0.399% lower than lagged total assets, respectively (models 2-3), than control firms with CEOs that make all stock gifts to family members and family trust funds. These decreases are approximately 38.3% and 35.8% of the average absolute values of both abnormal real activities and accrual earnings management for firms in my sample.

However, I find no significant difference between them in the likelihood of corporate financial fraud. One possible explanation for the insignificant association between charitable recipients of CEO stock donations and corporate fraud is that while different donation recipients reflect various levels of CEO altruism, such variation is not enough to cause a difference in accounting fraud which is associated with the most severe consequences among the different types of corporate financial reporting malfeasance.

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[20] I employ EB rather than propensity score matching (PSM) because PSM would significantly reduce my sample size and EB also has several statistical advantages (Hainmueller, 2012).

In summary, these findings are consistent with the notion that CEO altruism plays a disciplining role on corporate malfeasance in financial reporting.

Table 3.2 Charitable Recipients of CEO Stock Donations

This table presents the estimated regression results for the effect of CEO stock gifts to *Charitable Recipients* on *Fraud* (model 1), *RealActMan* (model 2) and *DisAcc* (model 3). In the subsample of firms with CEOs making stock donations, I match firms with other firms having similar firm characteristics, corporate governance and CEO incentives, using the entropy balance matching approach. I include industry and year fixed effects and same controls (used in Table 2.3) in all of the models. For definitions of the variables in the table see the Appendix. Standard errors are clustered by two-digit SIC industry and year, and t-statistics are reported on parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable of interest	*Fraud*	*RealActMan*	*DisAcc*
	(1) Probit	**(2)** OLS	**(3)** OLS
Charitable Recipients	**0.242**	**-0.531***	**-0.399****
	(0.87)	(-1.83)	(-1.99)
Constant	0.989	-3.220	-2.846**
	(0.96)	(-1.19)	(-2.02)
Number of observations	572	2,293	2,293
Industry Controls	Yes	Yes	Yes
Year Controls	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Adjusted/ Pseudo R^2	0.266	0.024	0.044

3.2.3. CEO political cash contributions with altruistic preferences

I use CEO stock donations as my primary proxy for CEO altruism, but in practice altruistic CEOs may also make other charitable contributions in forms of cash, real estate, time, or even blood and organ donations. However, there is limited information available on other types of individual donations. Among the other types of charitable contributions, I only find that data on individual political cash contributions are publicly available from the Federal Election Commission (FEC). While prior studies on the political preferences

of firm managers examine CEO political donations to the major parties in the U.S., the Democratic and Republican parties, (Hong and Kostovetsky, 2012; Francis et al., 2016; Elnahas and Kim, 2017), I examine CEO altruism by considering a CEO's cash donations to political committees/parties with explicit social purposes for family, child, female, elderly, health care, environment, education, or animal welfare issues.

The psychology and economics literature shows that individual altruists exhibit stronger social preferences in terms of care-oriented feelings and caregiving behaviours. In most scenarios, altruists give priority to the needs of dependent others, and to improving community well-being (Bowlby, 1982; Fehr and Fischbacher, 2003; Mikulincer et al., 2005; Fehr and Schmidt, 2006). Motivated by this theory, I argue that CEOs with altruistic preferences are more likely to think about supporting and helping others, even when they make political contributions, and thus that altruistic CEOs may give priority to making political contributions to parties and committees which show support for dependent others (i.e. animals, children, women and elders) and the broader well-being of the community. In the empirics, I examine the CEO-altruism effect by employing a sample of individual CEO cash donations to political committees and parties, and then identifying whether these political parties and committees demonstrate support for family, child, female, elderly, health care, environment, education, or animal welfare issues.

Data on cash political contribution by individuals are extracted from the FEC from 1992 to 2018.[21] I exclude individual donations which are not made by CEOs. Following the approach by Hong and Kostovetsky (2012), I add up all contributions to committees

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[21] I chose the commencing year as 1992 because I match individual CEOs in the FEC database with those listed in the EXECUCOMP database which is only available from 1992 onwards.

by a CEO in a calendar year and categorise them by committee profile and the registered party of the recipients (political action committees, and party committees). When a CEO donates to more than one committee in a given calendar year, they are categorized to the committee which received the bulk of their net cumulative cash contributions. I then hand-collect information from various sources about the main objectives of the committees, the registered party of the committees, and the policies of the supporting political party, to identify if these bodies support and pursue community welfare objectives. I replicate my baseline regressions but substitute my primary explanatory variable of CEO stock donation (*#Donate*) for my new alternative proxy of CEO altruism, *Altruistic Political Donations,* a dummy equal to one if a CEO makes individual cash donations of $200 or more to a political party/committee which supports family, child, female, elderly, health care, environment, education, or animal welfare issues, and zero otherwise.

Table 3.3 presents the CEO-altruism effect of CEOs making individual political cash contributions with altruistic preferences (*Altruistic Political Donation*) on all three levels of corporate financial reporting malfeasance, *Fraud* (model 1), *RealActMan* (model 2) and *DisAcc* (model 3). I find no significant relationship between the probability of fraud and CEO altruistic political donations. The result provides evidence that CEOs with altruistic political preferences do not significantly differentiate themselves from those without such preferences.

However, the estimated coefficients on real activities management and discretionary accruals manipulation are negative and statistically significant (t-statistics of -1.71 and -2.22), indicating that firms which are run by CEOs who act in line with their altruistic preferences when making political donations, experience a significantly lower real earnings and accruals management, on average, by approximately, 0.050% and 0.244%

of lagged total assets, than firms with CEOs who do not, respectively. These decreases are about 3.6% and 21.9% of the average values of abnormal real activities (1.388%) and accrual-based earnings management (1.113%) for firms in my sample.

Overall, my results are consistent with models 2-3 in my baseline regressions, indicating that the CEO-altruism effect proxied by *Altruistic Political Donations*, is significantly associated with reductions in real activities management and discretionary accruals, but not a significant decrease in the likelihood of a firm being subject to an SEC AAER.

Table 3.3 CEO Individual Political Contributions

This table presents the estimated regression results for the effect of CEOs making individual cash contributions (of $200 or more) to parties supporting family, child, female, elderly, health care, environment, education, or animal welfare causes (*Altruistic Political Donation*) on *Fraud* (model 1), *RealActMan* (model 2) and *DisAcc* (model 3). I include industry and year fixed effects and same controls (used in Table 2.3) in all of the models. For definitions of the variables in the table see the Appendix. Standard errors are clustered by two-digit SIC industry and year, and t-statistics are reported on parentheses.
*, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable of interest	*Fraud*	*RealActMan*	*DisAcc*
	(1)	**(2)**	**(3)**
	Probit	OLS	OLS
Altruistic Political Donation	**-0.766**	**-0.050***	**-0.244****
	(-0.82)	(-1.71)	(-2.22)
Constant	-4.223	2.170	12.840
	(-0.71)	(0.41)	(0.99)
Number of observations	264	2,649	2,649
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Adjusted/ Pseudo R^2	0.539	0.296	0.249

3.2.4. Timing of CEO stock donations around earnings announcements

Another concern with my primary proxy of CEO altruism is that CEOs may donate stocks before negative earnings announcements or after positive earnings announcements. In either case, CEO stock donations are more likely to reflect their exploitation of insider information and tax planning considerations (Yermack, 2009; Avci et al., 2016) rather than their altruism. To address this concern, I investigate the timing pattern of stock gifts relative to the dates of quarterly earnings announcements.[22] While insider trading (sales and purchases) is regularly prohibited during blackout periods (Bettis et al., 2000), stock gifts are exempted from SEC Rule 16b-5(a), which imposes insider trading restriction for open market sales.[23] Consistent with prior studies on executive stock option award timing (Yermack, 1997; Lie, 2005), Yermack (2009) finds that CEOs also have timing incentives for their stock gifts, in that they may take advantage of their information advantage to time stock donations just before negative (bullet-dodging), or just after positive (spring-loading) earnings announcements. Such CEOs thus gain personal financial benefits from maximizing income tax deductions by donating stocks at an appreciated local stock price. Accordingly, I argue that CEOs who donate stock gifts with no explicit opportunistic timing incentives around earnings announcements (non-"bullet-dodging" and non-"spring-loading") are more altruistic than

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[22] I choose to examine stock gift timings around firm quarterly earnings announcements because earnings news represents firm performance and firm financial health directly affecting investors' decisions and stock market prices. Moreover, all public companies must announce earnings news, thus earnings announcements are nearly universal schedule which renders them free of sample selection bias.

[23] SEC rule 16b-5(a) is current insider trading law and was amended in 1991. It states that "bona fide gifts present less likelihood for opportunities for abuse [compared to open market sales]" and provides an insider trading short-wing liability exemption for stock gifts.

CEOs who use the "bullet-dodging" and "spring-loading" timing strategies when making stock donations.

The data on company quarterly earnings announcements are obtained from the Thomson Reuters I/B/E/S database. In this analysis, I exclude firms with no donations or no earnings announcements. I follow Yermack (2009) and include only CEO stock gifts that are dated within five trading days prior to an earnings announcement (before earnings announcement) and those that are made on the earnings announcement day or subsequent four days (after earnings announcement). Then I define a new dummy variable, *BeforePostive-AfterNegative,* which equals one if a CEO donates stock within five trading days preceding a positive earnings announcement (non-"spring-loading") or stock gifts are made on the day or the four days following a negative earnings announcement (non-"bullet-dodging"), and zero otherwise. To identify whether an earnings announcement is negative and positive, I compare actual firm quarterly earnings announcements with quarterly analyst earnings forecasts. A negative earnings announcement is when a firm's actual earnings are lower than forecast earnings, and a positive earnings announcement is when a firm's actual earnings meet or exceed forecast earnings.

In the univariate test, I examine the mean differences in my corporate malfeasance variables *Fraud, RealActMan* and *DisAcc* when sorting them by whether or not CEOs donate stocks without "bullet-dodging" and "spring-loading" (*BeforePostive-AfterNegative=1*). The initial results in Panel A (Table 3.4) show that firms with CEOs who make stock donations before positive earnings announcements and who donate after negative earnings announcements, are 0.144% less likely to use discretionary accruals to manipulate earnings than other CEOs. We, however, find no significant mean differences in fraud and real activities management.

Next, I replicate my baseline regressions, but use *BeforePostive-AfterNegative* to measure CEO altruism, as my new alternative explanatory variable. In this analysis, I also employ the entropy balancing approach to match characteristics of firms whose CEOs are not taking account of insider information about earnings announcements in making stock gifts with those of firms run by CEOs who use insider information and timing strategies. I apply a similar approach to generate the entropy covariate balance and set a balance constraint as discussed above in section 4.7.

Table 3.4, Panel B reports that the estimated coefficients of *Fraud* and *DisAcc* (models 1 and 3) are negative and statistically significant (t-statistics of -1.69 and -2.03), indicating that firms with altruistic CEOs who do not use insider information to time their stock donations are, on average, less likely to commit fraud by 37.4%, and less likely to manipulate earnings using an accruals-based management approach by 11.1%, than firms whose CEOs take advantage of insider material to time stock gifts. However, I find no evidence of a significant decrease in manipulation of real activities in firms with altruistic CEOs who donate without using inside information about earnings and the timing strategies I outline.

Other than for real activities management, the results in Table 3.4 are consistent with my baseline results. I find that the probabilities of fraud and accruals management decrease significantly in firms run by altruistic CEOs who do not exploit insider information and do not use the strategic timing of stock gifts relative to earnings announcement dates.

Table 3.4 Timing of CEO Stock Donation around Earnings Announcements

This table presents estimates for the effect of CEOs timing stock donations around company quarterly earnings announcements (*BeforePostive-AfterNegative*) on *Fraud, RealActMan* and *DisAcc*. In this analysis, I include firms with CEOs making donations that are dated within the five trading days prior to an earnings announcement or firms with CEOs gifting stock on the earnings announcement day or subsequent four days. I match firms with similar firm characteristics, corporate governance and CEO incentives, using the entropy balance matching approach. Panel A presents values of mean differences in *Fraud, RealActMan* and *DisAcc* when sorting them by timing of stock gifts prior to positive and following negative earnings announcements. Panel B shows the panel regression results of timing of stock gifts before positive and after negative earnings announcements on *Fraud*, *RealActMan* and *DisAcc*. I include industry and year fixed effects and same controls (used in Table 2.3) in all of the models. For definitions of the variables in the table see the Appendix. Standard errors are clustered by two-digit SIC industry, and t-statistics are reported on parentheses.

*, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: Univariate test

Sort by Timing of gifts	$[t_{-5}, t_{-1}]$ **Before positive earnings announcement or $[t_0, t_{+4}]$ After negative earnings announcement** *(BeforePostive-AfterNegative)*				
	Yes		*No*		*Difference in mean (Yes-No)*
	Mean	*SD*	*Mean*	*SD*	
Fraud	0.011	0.105	0.018	0.132	**-0.007**
					(-1.06)
RealActMan	0.666	0.891	0.654	0.795	**0.012**
					(0.27)
DisAcc	0.285	0.805	0.429	1.135	**-0.144***
					(2.47)

Panel B: Regression results

Variable of interest	*Fraud*	*RealActMan*	*DisAcc*
	(1)	**(2)**	**(3)**
	Probit	OLS	OLS
BeforePostive-AfterNegative	**-0.374***	**-0.046**	**-0.123***
	(-1.69)	(-1.09)	(-2.03)
Constant	-21.186**	6.085	25.115**
	(-2.11)	(1.05)	(0.97)
Number of observations	484	1,366	1,366
Industry Controls	Yes	Yes	Yes
Year Controls	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Adjusted/ Pseudo R^2	0.240	0.314	0.104

3.2.5. CEO stock donations non-after run-up stock awards

My primary proxy of CEO altruism might raise a potential concern that CEOs may donate more stocks after receiving additional stock in their firms. Modern portfolio theory (Markowitz, 1952) suggests that investors can reduce their unsystematic risk by holding diversified portfolios. Prior studies show that CEO wealth (both their future human capital income and their financial assets in a firm) is strongly correlated with firm performance, and thus that without diversifying assets in their wealth portfolio, firm CEOs may bear a greater firm-specific risk than ordinary investors (Jin, 2002). Consistent to the literature, Ofek and Yermack (2000) find that once firm executives reach a certain ownership level, they sell their shares when receiving new options and stock awards for diversification to hedge the unsystematic risks of concentrating wealth in a single asset. Motivated by these findings, I argue that if CEOs actively rebalance their wealth portfolio by donating shares after being awarded a significantly large value amount of stocks, these stock donations are more likely to represent a strategic asset diversification to optimize a CEO's personal wealth rather than CEO altruism. As such these CEOs are considered less altruistic than CEOs who donate stocks even when receiving no stock awards or a relatively small value amount of stock awards.

I collect data on stock awards (in dollar values)[24] from the Incentive Lab database. I define a new proxy of CEO altruism, *Non-after run-up*, which is equal to one if a CEO donates stocks even when receiving no stock awards or a relatively small amount of stock

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[24] I use stock awards in dollar value instead of number of shares because a CEO's wealth in dollar value depends on not only the number of shares but also on the stock price in dollar value. Therefore, I argue that a CEO's incentive to diversify away the unsystematic risk associated with concentrating wealth in a single asset will be more sensitive to the dollar value of the holdings in the CEO's portfolio.

awards (in dollar value) in the same fiscal year, and zero if a CEO makes stock donations after receiving a significantly large value amount of stock awards in the same fiscal year. I define stock awards as *significantly large* if their dollar value in any given fiscal year is (i) greater than the average value of stock awarded to CEOs during their tenure in a firm, and (ii) contributes at least 50% of the total stock awarded to CEOs during their tenure in a firm. In this analysis, I include only firms run by CEOs who make stock donations and those with available data on CEO stock awards (in dollar value) in the Incentive Lab database. I then replicate all baseline regressions but replace my primary explanatory variable (*#Donate)* with *Non-after run-up* – my new proxy for CEO altruism.

Table 3.5 presents the negative association between the *Non-after run-up* effect of CEO stock donations and corporate malfeasance in financial reporting. The estimated coefficient of *Fraud* in model 1 is negative and statistically significant (t-statistic of -2.38), indicating that the probability of fraud is, on average, approximately 100% lower when CEOs make stock donations even though they are not awarded any stocks or receive a relatively small dollar amount of stock awards.

Table 3.5 also shows that the absolute value of accruals management (*DisAcc*) is significantly lower, on average, by about 0.483% of lagged total assets (t-statistic -3.27), than it is in firms with CEOs who donate stocks to actively rebalance their wealth portfolio after being awarded a significantly large value amount of stock. This decrease is about 43.4% of the average absolute value of accruals management for firms in my sample. However, in this case I find no significant decrease in abnormal real activities management (*RealActMan*) for firms with altruistic CEOs.

Overall, the results in Table 3.5, other than those for real activities management, are consistent with my baseline results. I find that the probabilities of fraud and discretionary

accruals manipulation decrease significantly for firms run by altruistic CEOs who make

stock donations irrespective of any incentives to use strategic asset diversification to

actively rebalance their wealth portfolios when being awarded a significantly large value

amount of stock.

Table 3.5 CEO Stock Donations Non-After Run-Up Stock Awards

This table presents the estimated regression results for the effect of CEOs donating stockduring the period of non-after run-up of stock awards (*Non-after run-up*) on *Fraud* (model 1), *RealActMan* (model 2) and *DisAcc* (model 3). In the subsample of firms with CEOs making stock donations, I match firms with other firms having similar firm characteristics, corporate governance and CEO incentives, using the entropy balance matching approach. I include industry and year fixed effects and same controls (used in Table 2.3) in all of the models. For definitions of the variables in the table see the Appendix. Standard errors are clustered by two-digit SIC industry and year, and t-statistics are reported on parentheses.
*, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable of interest	*Fraud*	*RealActMan*	*DisAcc*
	(1) Probit	**(2)** OLS	**(3)** OLS
Non-after run-up	**-1.008****	**-0.028**	**-0.483*****
	(-2.38)	(-0.73)	(-3.27)
Constant	8.551**	-0.063*	0.731***
	(2.12)	(-1.89)	(3.89)
Number of observations	324	1996	1996
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Adjusted/ Pseudo R^2	0.656	0.424	0.526

3.3 Readability of Annual Financial Reports

To provide additional evidence on the effect of CEO altruism on various forms of

corporate malfeasance in financial reporting, I examine whether personal managerial

altruism can also impact on the readability of a firm's annual financial report. While it is

technically not a form of misreporting, reducing the readability of the financial reports

can make it easier to hide undesirable financial information (Bloomfield, 2008; Li, 2008).

I argue that the more readable and understandable financial statements are, the better they

represent corporate financial performance to stakeholders (Lo et al., 2017). This also likely plays an important role in helping stakeholders avoid corporate losses camouflaged in unclear or unreadable financial reports.

I follow Bonsall IV et al. (2017) and borrow data on the *Bog index* to measure financial reporting readability from 1996 to 2016. The *Bog Index* is a comprehensive measure of readability specified in financial applications, where a higher *Bog Index* value equates to a less readable document. I replicate my earlier regressions and turn my attention to the CEO-altruism effect on the *Bog Index*.

Table 3.6 reports estimated coefficients of the effects of CEO stock donations (*#Donate*, *DumDonate* and *DonateRatio*) and higher levels of CEO altruism (*NonBackdate*, *NonTaxplanning*, and *Non-(Backdate & TaxPlanning)*), on the *BogInd*ex. The coefficients of #*Donate* and *DumDonate* are negative and statistically significant (models 1-8), indicating that the number of donations and the likelihood of gifting stocks are both associated with increased financial reporting readability. However, I have no significant evidence on the relationship between the ratio of stock donations and the readability of financial reports.

With respect to CEO backdating and tax planning incentives, my results imply that, on average, financial reports are more comprehendible for firms with CEOs who do not backdate or who both fail to backdate and fail to engage in tax favorable planning when making stock donations (models 2, 6 and 10). In contrast, I find no evidence that the additional effect of *NonTaxplanning* alone (models 3 and 7) can account for further improvement in the readability of firm financial statements.

Table 3.6 Readability of Annual Financial Reports

This table shows regression results on the effects of *#Donate (models 1-4), DumDonate (models 5-8), DonateRatio (models 9-12)* and *NonBackdate, NonTaxplanning,* and *Non-(Backdate & Taxplanning)* on financial report readability (*BogIndex*). See the Appendix for definitions of the variables in this table. I include controls as used in Table 2.3 (Chapter 2), industry and year fixed effects in all regressions. Standard errors are clustered by two-digit SIC industry and year, and t-statistics are reported in parentheses.
*, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable of interest	BogIndex											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
#Donate	-0.038**	-0.030*	-0.032*	-0.033**								
	(-2.39)	(-1.87)	(-1.94)	(-2.06)								
DumDonation					-0.263***	-0.179**	-0.270***	-0.199**				
					(-3.35)	(-2.00)	(-2.65)	(-2.35)				
DonateRatio									0.209	0.366	0.386	0.330
									(0.83)	(1.41)	(1.49)	(1.29)
NonBackdate		-0.470***				-0.363**				-0.570***		
		(-3.39)				(-2.29)				(-3.98)		
NonTaxplanning			-0.167				0.015				-0.293**	
			(-1.54)				(0.11)				(-2.57)	
Non-(Backdate & Taxplanning)				-0.543***				-0.419**				-0.638***
				(-3.36)				(-2.39)				(-3.91)
Constant	73.909***	73.892***	73.917***	73.900***	73.923***	73.905***	73.922***	73.912***	73.786***	73.762***	73.793***	73.771***
	(132.31)	(132.31)	(132.46)	(132.25)	(132.65)	(132.64)	(132.63)	(132.56)	(127.75)	(127.82)	(127.85)	(127.71)
Number of observations	56,290	56,290	56,290	56,290	56,290	56,290	56,290	56,290	55,345	55,345	55,345	55,345
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.335	0.335	0.335	0.335	0.335	0.335	0.335	0.335	0.335	0.335	0.335	0.335

3.4 Conclusion

This chapter addresses a potential measurement error of CEO personal altruism and extends the effect of CEO altruism on the readability of a firm' financial reports. This first extended study extends the measurement of personal managerial altruism into the five alternative measures other than the use of CEO stock donations. These novel alternative proxies of CEO altruism are constructed by observing CEO personal philanthropic activities in community, examining CEO cash donations, and investigating if CEOs have other opportunistic incentives when making stocks donations. The results reveal that all five alternative measures of CEO altruism are negatively associated with the probability of committing fraud, real activities and accruals earnings management. The findings provide a robust evidence that personal altruism of CEOs in diminishing corporate malfeasance in financial report after eliminating the potential measurement error of using CEO stock donations to proxy CEO altruism.

The second extended study provides an additional evidence on how senior management, by their virtue of personal altruism, can influence a variety of corporate financial reporting misconduct, including the extremely least serious form of the readability of financial reports. The results indicate the number of stock donations and the probability of donating stocks are both aggregated with improved financial reporting readability. These effects are more pronounced if firms led by CEOs who donate stocks without personal financial motives, (non-backdating and non-tax planning incentives in gifting stocks). The overall findings enrich the literature by providing the novel empirical evidence on how personal managerial altruism of corporate executives can improve the readability of their firm's financial reports.

CHAPTER 4

DIFFERENCE IN DEGREES: CEO EDUCATIONAL BACKGROUND AND CORPORATE ENVIRONMENT RESPONSIBILITY

4.1. Introduction

Corporate environmental responsibility (CSR) is an issue of increasing importance to investors and managers (Flammer, 2013; Flammer, 2015; Hawn and Ioannou, 2016). Environmental infringements by large companies not only harm eco-systems and pollute natural resources, but also destroy shareholder value (e.g. (Flammer, 2013). For example, following BP's Deepwater Horizon oil spill, the onslaught of litigation resulted in combined settlements of $62 billion (Bomey, 2016). In 2017, The U.S. federal Environmental Protection Agency (EPA) charged environmental offenders $1.6 billion in administrative and civil judicia penalties and $2.98 billion in criminal enforcement cases (EPA, 2017b). These enforcement actions relate to the contamination of 20.5 million cubic yards of soil and 412 million cubic yards of water, which potentially affect the safety of the drinking water of half a million people (EPA, 2017a). Karpoff *et al.* (2005) show that the legal penalty for an average lawsuit alleging an environmental violation amounted to 2.26 percent of the accused firm's market capitalization, which represents a substantial loss of shareholder wealth.

Prior literature finds that corporate governance as firm-level determinants of corporate environmental CSR responsibility (Kassinis and Vafeas, 2002; Walls et al., 2012; Liu, 2018). For example, these studies suggest that larger board size and greater insider ownership are linked to poorer environmental performance (Kassinis and Vafeas, 2002; Walls *et al.*, 2012); whereas board independence (Kassinis and Vafeas, 2002) and gender diversity improve CSR engagement and environmental performance (Walls *et al.*, 2012; Liu, 2018). At the individual level, upper echelons theory postulates that managerial backgrounds and characteristics play an important role in determining strategic decision-making within a corporation (Hambrick and Mason, 1984; Carpenter *et al.*, 2004; Hambrick, 2007). Consistently, prior research finds that CEO hubris is associated with socially irresponsible conduct (Tang *et al.*, 2015). In contrast, firms led by CEOs with liberal political ideology (Chin *et al.*, 2013; Gupta *et al.*, 2017) tend to have better CSR ratings. Further, CEOs' family composition significantly predicts their engagements with CSR. According to Cronqvist and Yu (2017), CEOs who have daughters are more inclined to engage with CSR, as their values are influenced by female socialization through raising daughters.

CEO education is one aspect of executive characteristics that can play a significant role in influencing corporate policies (Lewis *et al.*, 2014; Gounopoulos and Pham, 2018; Henderson *et al.*, 2018). However, only a small number of studies specifically examine the impact of CEO education on a firm's strategy towards corporate environmental CSR responsibility. To address this gap in the literature, I posit that difference in CEOs' educational background in science and MBA education degrees may have significant predictive power over corporate overall environmental CSR ratings and engagement.

In addition, I examine corporate environmental responsibilities by observing firms' overall environmental CSR scores, as well as separately examining firm-level determinants of environmental CSR engagements which are captured by environmental concerns and strengths. The separate investigation of environmental concerns and environmental strengths is crucial to distinguishing a firm's engagement with positive eco-friendly polices from more aggressive approaches aimed at alleviating environmental concerns.

In this study, I develop a new theoretical framework by extending familiarization theory and self-efficacy theory in the psychology literature to a novel corporate setting. Specifically, I investigate whether and how CEO education makes a difference in influencing environmental engagement and overall CSR rating scores. In developing my hypotheses, I draw on familiarization theory, which posits that individuals are more prone to risk-taking when they are more familiar with a subject matter, and are more risk-averse to deal with an unfamiliar one (Flanders and Thistlethwaite, 1967; Millon and Lerner, 2003). Further, self-efficacy theory states that risk-taking increases when an individual perceives him/herself as competent in the subject matter of decision making (Krueger and Dickson, 1994). Meanwhile, prior studies also suggest that manager individuals show more confidence in their areas of expertise (Custódio and Metzger, 2014a; Gounopoulos and Pham, 2018; Henderson et al., 2018).

Based on this theoretical framework, I posit that CEOs with science-related education, by virtue of their technical advanced knowledge, have greater familiarity with the technical aspects of their firms' environmental operations and, at the same time, are more likely to self-perceive as experts in making green-related technology decisions. Specifically, science-educated CEOs with their advanced knowledge and greater capability in dealing with science

and technology-related issues including environmental aspects may have a stronger science content understanding and more proficient technical skills to better deal with increased risks of environmental violations, compared to non-science educated CEOs. Consequently, scientist CEOs are more likely to take risks in increasing environmental concerns that may violate environmental regulations but may potentially reduce firm costs (i.e. lower production costs), rather than investing in developing positive eco-friendly polices. I therefore first hypothesize that science-educated CEOs are more likely to adopt riskier environmental policies that lead to worse environmental CSR ratings.

In contrast, prior studies show that MBA CEOs indeed have greater levels of human capital to outperform in more sophisticated business cases (Grimm and Smith, 1991; Geletkanycz and Black, 2001; Graham and Harvey, 2001; Lewis et al., 2014). Even though MBA CEOs may have a limited knowledge and capacity to deal more-in-depth with the technical aspects in environmental matters, MBA-educated CEOs possess greater familiarity with interpreting and managing corporate environmental responsibility as a strategic opportunity to enhance a firm's value, compared to non-MBA CEOs (Giacalone and Thompson, 2006; Neubaum et al., 2009). CEOs with an MBA education thus show great confidence and can be more aggressive in pursuing firm profitable objectives, but they become more risk-averse when dealing with additional risks arising from what they are not familiar with and self-perceived expertise. Building on the familiarity and self-efficacy theories, my second hypothesis suggests that MBA CEOs outperform non-MBA CEOs in environmental CSR ratings by carefully undertaking more risk-averse environmental policies and practices to avoid potential increased risks of aggressively engaging in environmental concerns.

To test the hypotheses in my study, I examine a sample of Standard and Poor's 1500 (S&P 1500) firms during 2000–2015. I collect information on CEO educational backgrounds from Marquis Who's Who Online Database, which provides biographical information of over one million individuals in the United States (U.S.). Following prior studies (Fernando *et al.*, 2017; Gupta *et al.*, 2017; Flammer, 2018), I employ Kinder Lydenberg Domini (KLD) environmental ratings, which capture the number of environmental strengths and concerns of a firm, in order to measure a firm's policies and engagement with environmental CSR.

The selection of science-trained CEOs and MBA-educated CEOs is potentially an endogenously determined firm decision. For example, firms with more pollution-prone operations (such as mining firms) may be more likely to employ CEOs with education in science due to the nature of their operations. In contrast, firms within more environmentally friendly industries (such as retail trading and financial service firms) may be more likely to hire CEOs with an MBA degree to pursue better overall environmental CSR and avoid increased environmental risks. I employ several different approaches to deal with potential endogeneity. My main identification strategy is utilizing a difference-in-difference methodology, which employs a propensity score matched subsample of firms that have experienced CEO turnovers. This enables us to compare a firm's environmental CSR scores before and after a CEO turnover, ensuring that the observed differences are indeed due to the change in CEO and not other unobservable firm characteristics.

Moreover, I also conduct additional tests to ensure that my results are not driven by alternative explanations. Another concern may arise from scientist CEOs being more skeptical about the "green-washing" nature of environmental CSR or that firms wishing to pursue more aggressive environmental strategies deliberately hire scientist-educated CEOs

to further their agenda. In the same way, firms which pursue more environmentally friendly policies and practices intentionally employ MBA-educated CEOs to well-manage and achieve their objectives. I do this by isolating the CEO's *personal* influence over corporate environmental policies, specifically, I observe whether other CEO personal traits, such as familial structure, moderate the relationship between science education and environmental CSR and strengthen the effect of MBA education on a firm's environmental CSR (Cronqvist and Yu, (2017).

My key findings support my hypotheses that firms with science-educated CEOs have poorer engagement in environmental CSR which is attributable to firms' being less willing to invest more in developing environmental strengths, as well as an increased exposure to a greater number of environmental concerns. In contrast, the results suggest that firms with MBA-educated CEOs improve their environmental CSR ratings due to their risk-averse environmental policies by undertaking ventures with fewer environmental concerns. Moreover, the robust results show that CEO's family composition moderately affects CEOs' risk-taking behaviours in committing environmental concerns, and thus result in reducing the negative effect of science education but strengthen the positive effect of MBA education on a firm's environmental CSR.

This chapter makes several contributions to the existing literature. First, I bridge two important areas of research: the literature examining the impacts of CEO education on firm strategies (Lewis *et al.*, 2014; Miller *et al.*, 2015; Gounopoulos and Pham, 2018; Henderson *et al.*, 2018) and that investigating the determinants of firm CSR performance (Kassinis and Vafeas, 2002; Walls *et al.*, 2012; Liu, 2018). Given the growing importance of corporate environmental responsibility (Flammer, 2013; Martin and Moser, 2016), I provide novel

evidence of the impacts of CEO education on firms' CSR engagements and explain why scientist CEOs (MBA CEOs) underperform non-scientist CEOs (outperform non-MBA CEOs) in a firm's overall environmental CSR ratings and engagement. Second, I develop a new theoretical framework, drawing on the psychology theories of familiarization and self-efficacy, to explain the link between CEO personal characteristics and firm policies. My findings add new depth to the existing evidence in support of upper echelons theory.

The remainder of this chapter is organized as follows. Section 2 outlines the underlying theories and hypotheses. Section 3 describes the data, sample constructions and model modifications. Section 4 presents descriptive statistics, my baseline empirical results, and further reports robustness checks. Section 5 discusses my findings and concludes.

4.2. Theory and Hypotheses

4.2.1. Upper echelons theory and CEO personal traits

According to upper echelons theory, CEO personal backgrounds and idiosyncrasies play a role in determining strategic choices within a corporation (Hambrick and Mason, 1984). Underlying this theory is the view that managerial decision-making is not a mere mechanical process of profit-maximization. Rather, like all human processes, managers are influenced by behavioural factors. Consequently, managers' personal idiosyncrasies, developed through their upbringing and experience, can affect implicit assumptions during the decision-making process, and thus imprint their own values and cognitive styles to shape organizational policies and outcomes (Wally and Baum, 1994; Carpenter et al., 2004; Hambrick, 2007).

Consistent with upper echelons theory, a myriad of executive personal traits are documented to influence corporate decision-making outcomes, including CEO personality (Nadkarni and Herrmann, 2010; Herrmann and Nadkarni, 2014; Malhotra *et al.*, 2018), cultural backgrounds (Pan et al., 2017), political ideology (Chin *et al.*, 2013; Gupta *et al.*, 2017), family structure (Cronqvist and Yu, 2017), education (Lewis *et al.*, 2014; Miller *et al.*, 2015; Henderson *et al.*, 2018), career pathways (Custódio and Metzger, 2014a; Benmelech and Frydman, 2015; Cummings and Knott, 2018), awards and celebrity (Malmendier and Tate, 2009; Shi *et al.*, 2017), and personal risk preference (Sunder et al., 2017). These CEO characteristics have significant implications for firms' policies and risk-taking behaviours. For example, CEOs who are inclined towards personal risk-taking, as evidenced by owning private pilot licenses or having highly leveraged home loans, tend to lead firms that engage in higher corporate risk-taking in financing and investment policies (Sunder et al., 2017).

In the specific context of CSR, recent studies show that CEO personal political and ideological values are important in determining a firm's CSR engagement. Specifically, firms with socially liberal managers and employees are more likely to invest in CSR (Chin *et al.*, 2013; Gupta *et al.*, 2017). In addition, firms led by CEOs who have daughters tend to have higher CSR ratings (Cronqvist and Yu, 2017), which the authors attribute to the CEOs' evolving ethical values through socialization with female children. These studies show that engagement in corporate social responsibility is, at least in part, influenced by the personal views and perspectives of the CEOs.

4.2.2. CEO Educational Background and CSR Engagement

Despite the fact that CEO education is an important personal trait that influences firm policies and outcomes (e.g. (Finkelstein et al., 2009; Custódio and Metzger, 2014a; Gounopoulos and Pham, 2018; Henderson et al., 2018), no prior study has examined how CEO education influences environmental CSR engagement and ratings. The close prior research which complements my study is conducted by Slater and Dixon-Fowler (2010) and Lewis *et al.* (2014). The former study suggests a positive relationship between an MBA education and corporate environmental performance (Slater and Dixon-Fowler, 2010). However, the results in this study are limited by using an aggregated measure of a firm's environmental performance in a small sample size from 2003 to 2004, rather than examining a variety of determinants of environmental CSR performance by separately observing corporate environmental concerns and strengths. The following former research (Lewis et al., 2014) examines the impacts of CEO education on firms' environmental *disclosure*. Although Lewis *et al.* (2014) do not focus on corporate environmental CSR performance, their evidence does show that a CEO's education has an impact on the level of environmental disclosure that a firm provides to the public.

Motivated by prior studies, this study examines the effect of CEO's educational backgrounds on formulating corporate environmental policies and practices. I use the KLD environmental score as a measure of a firm's engagement with corporate environmental responsibility, following prior studies (Servaes and Tamayo, 2013; Chava, 2014; Werner, 2015). Specifically, KLD environmental scores measure the number of a firm's environmental strengths and environmental concerns. Environmental strengths typically

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capture positive environmental initiatives such as clean technology and waste management systems. Environmental concerns capture negative environmental indicators relating to climate change and other eco-harmful practices. One unitary score is calculated by deducting the total number of concerns from the total number of strengths. As KLD scores separately capture environmental strengths and concerns, this provides an additional advantage of allowing me to distinguish between a firm's environmental engagement with positive eco-friendly initiatives versus its weaknesses in the form of environmental concerns.

4.2.3. Familiarization theory and self-efficacy theory

This study also extends upper echelons theory by drawing on familiarization theory and self-efficacy theory from the psychology literature, to develop a theoretical framework on how CEOs' self-perceived expertise, derived from their education, can influence corporate decision-making. Specifically, I postulate that managers engage in greater risk-taking in their areas of specialized training. Research on familiarization theory shows that individuals take greater risks when they are familiar with the subject matter (Flanders and Thistlethwaite, 1967; Millon and Lerner, 2003; Figner and Weber, 2011). Burger (1986) posits that this is because an individual experiences a greater sense of control when performing a familiar task compared with an unfamiliar one. Custódio and Metzger (2014a) offer empirical evidence that CEOs with financial expertise tend to adopt riskier corporate financing policies, including holding less cash, issuing more debt, and engaging in more share repurchases.

Second, perceived self-efficacy is another psychological factor that increases risk-taking tendencies (Krueger and Dickson, 1994). Krueger and Dickson (1994) argue that self-perceived competence affects individuals' risk assessments by increasing the expectation of success and decreasing perceived likelihood of failure. Weber *et al.* (2005) find that investors exhibit a favourable bias towards stocks with familiar names, which they self-perceive to be less risky, because they feel more competent when evaluating stocks with more familiar names than with less familiar names.

Although CEO educational backgrounds involve several different categories, this study focuses on a CEO's science-related and MBA educations, which represent two common educational degrees taken by CEOs in publicly listed firms (Felicelli, 2008). Moreover, these two educational academic fields exhibit apparent differences in CEOs' knowledge, abilities and self-perceived expertise about the technical aspects of environmental matters as well as strategic decision-making and business management skills at a corporate level.

4.2.4. Science degree

Building upon familiarization and self-efficacy theories, I extend the applications of these theories to the corporate boardroom setting. I posit that CEOs with science-related education are more familiar with science and technology-related fields including the green-related technologies used in a firm's environmental operations and have greater self-perceived expertise. Therefore, I hypothesize that scientist CEOs, by virtue of their science advanced knowledge and self-perceived expertise in dealing with environmental science-related matters, tend to be more risk-tolerant in formulating corporate environmental policies

and practices by involving in more environmental violations and reducing investment in developing positive eco-environmental friendly activities. This increase in risk-taking results in greater environmental exposure and lower environmental CSR ratings. Thus, I formulate the following hypothesis:

H1: Scientist CEOs are associated with poorer overall environmental CSR ratings.

And, as KLD scores separately capture environmental concerns and strengths, I hypothesize:

H1a: Scientist CEOs are associated with more environmental CSR concerns.

H1b: Scientist CEOs are associated with fewer environmental CSR strengths.

In addition, the sub-hypotheses separately examining environmental strengths and concerns enable me to provide evidence on an alternative explanation for why scientist CEOs underperform in environmental CSR. Scientist CEOs may be more skeptical about the environmental impacts of CSR initiatives and view them as mere green-washing (Walker and Wan, 2012; Matejek and Gössling, 2014). If this alternative explanation is true then I should expect to observe significantly fewer environmental strengths in scientist-led firms, but no difference in the number of environmental concerns.

4.2.5. MBA degree

Prior research suggests that MBA education creates corporate executives with profit-drive focus and a strategic management view on corporate decision-making rather than social responsibility initiatives (Ghoshal, 2005; Giacalone and Thompson, 2006). However, when

corporate environmental responsibility is taught in MBA programs in business schools, it is considered within an economic context and an organization-centered worldview (Giacalone and Thompson, 2006). Specifically, business senior education teaches corporate environmental CSR as a business case of strategic decision-making to gain organizational profits and to promote firm reputation to organizational stakeholders (Giacalone and Thompson, 2006). MBA-educated CEOs thus possess a greater familiarity and self-perceived expertise in interpreting and dealing with corporate environmental responsibility as a strategic opportunity to enhance a firm's value (Neubaum et al., 2009). Consequently, I argue that firms run by CEOs with an MBA outperform firms with non-MBA CEOs in overall environmental CSR ratings. This leads to my second hypothesis:

H2: MBA CEOs are associated with better overall environmental CSR ratings.

Although MBA-educated CEOs may be more aggressive to achieve a better environmental CSR that is driven from their greater familiarity and competence in utilizing corporate environmental CSR as a strategic investment decision, prior studies suggests that CEOs with an MBA may not have adequate professional knowledge and a limited specialized competence to deal with the technical aspects of environmental matters (Bennis and O'toole, 2005; Benn and Dunphy, 2009). Building on familiarity and self-efficacy theories, I argue that MBA-educated CEOs may be more risk-averse in dealing with more sophisticated environmental matters. Consequently, MBA CEOs are expected to invest in developing more environmental strengths and avoid aggressively engaging in environmental threats. These

risk-averse behaviours of MBA CEOs lead to a reduction of environmental concerns and greater environmental strengths. Thus, my next two sub-hypotheses are:

H2a: *MBA CEOs are associated with fewer environmental CSR concerns.*

H2b: *MBA CEOs are associated with more environmental CSR strengths.*

4.3. Data and Methodology

4.3.1. Sample selection and data collection

I employ a sample of all Standard and Poor's 1500 (S&P 1500) companies with available data from the Execucomp Database during 2000–2015. The sample consists of 2,881 current and former S&P 1500 firms. Information on firm corporate governance, such as board composition and ownership structure, is obtained from ExecuComp and the Institutional Shareholder Services (ISS) Corporate Governance and Directors Databases. Accounting information is collected from Compustat Database. The panel dataset initially comprises of 10,477 firm-year observations. After removing firm-years with missing data from Compustat, Execucomp, KLD, or Marquis Who's Who Databases (as detailed below), the final sample employed in the regression analyses comprises of 6,276 firm-year observations.

4.3.2. Environmental CSR scores

I employ three empirical proxies for corporate environmental responsibility. I first examine overall environmental CSR scores (*Env Ratings*). I then separately observe a firm's

environmental concerns and environmental strengths to distinguish between a firm's environmental engagement with positive eco-friendly initiatives (*Env Strengths*) versus its weaknesses in the form of environmental concerns (*Env Concerns*).

I obtain environmental CSR ratings by Kinder, Lydenberg, and Domini (KLD) from the KLD MSCI Database. The KLD dataset provides environmental CSR ratings for each firm-year, including the number of environmental strengths (*Env Strengths*) and weaknesses (*Env Concerns*), from which I calculate an aggregated rating that equals the number of strengths less the number of weaknesses (*Env Ratings*). A higher number of environmental strengths and overall environmental rating indicates greater engagement with environmental CSR, whereas a higher number of environmental concerns indicates poorer engagement with environmental CSR.

Environmental CSR scores are inherently industry dependent. For example, the firms in the mining and oil industry (SIC 2), on average, have the worst environment CSR scores (-0.776) across all industries, which are attributable to increased environmental concerns (1.346). In contrast, firms in the retail trade (SIC 7) are, on average, 129.1 percent higher in environmental rating scores (0.226) and have 93.1 percent fewer environment concerns (0.093) than those in the mining and oil industry. To account for this substantial variation across industries, I adjust all of my measures of CSR ratings by the industry-mean (calculated within each one-digit SIC code), in order to capture a firm's environmental CSR engagement and overall performance relative to its industry peers.

4.3.3. CEO Science and MBA educations

I obtain CEO biographic information from Marquis Who's Who Online Database to construct my two key independent variables, *Scientist CEO* and *MBA CEO*. *Scientist CEO* captures whether a CEO has received at least one degree in the field of science, technology, engineering, or mathematics (STEM). The binary variable *Scientist CEO* is coded one if the CEO holds a degree in STEM and zero otherwise.[25] Similarly, *MBA CEO* is a binary variable to capture the effect of an MBA education. I coded *MBA CEO* as one if the CEO has received a Master of Business Administration (MBA) degree and zero otherwise.

4.3.4. Control variables

My selection of firm-level accounting variables to serve as controls in my regressions is based on following prior research (Kassinis and Vafeas, 2002; Walls *et al.*, 2012; Liu, 2018). I use a series of control variables, including the natural logarithm of total assets (*Firm Size*), firm age (*Firm Age*), market-to-book ratio (*Market-to-Book*), performance as proxied by return on assets (*ROA*) and a binary variable capturing negative earnings (*Loss*), debt-to-equity ratio (*leverage*), growth potential as proxied by sales growth (*Sales Growth*) and

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[25] As a CEO is a senior managerial position, I expect that all CEOs will have obtained their STEM degree *prior* to becoming a CEO. I confirm this assumption in the data: no CEO in my sample has obtained a STEM-related degree *during* their tenure as CEO.

research and development spending (*R&D*), firm valuation (*Tobin's Q*), and accounts receivable (*Receivables*). All control variables are lagged by one year.

Prior studies also find that corporate governance plays an important role in determining firms' environmental performance. Specifically, firms with larger boards and greater insider ownership have worse environmental performance, whereas more gender-diverse boards are associated with superior environmental performance (Liu, 2018). There is inconsistent evidence over whether board independence is associated with better or worse environmental CSR (Kassinis and Vafeas, 2002; Walls et al., 2012). In light of these prior findings, I also control for corporate governance quality as proxied by board characteristics, including size (*Board Size*), the proportion of independent directors (*Board Indep*), and board gender diversity as proxied by the proportion of female directors (*Female Directors*). In addition, I control for firm ownership structure, which is shown to be an important determinant of firms' engagement with CSR (Walls *et al.*, 2012), including institutional ownership (*Inst Ownership*) and executive shareholdings (*CEO Ownership*). Finally, I control for other CEO-level characteristics, including age and gender, as both are commonly controlled for characteristics when examining corporate decision makers (e.g. (Cumming et al., 2015).

4.3.5. Baseline regression models

I first run panel least squares regressions in my baseline models to test my hypotheses. My baseline regressions are specified as follows in Equation (1):

$$EnvCSR \mid EnvStrengths \mid EnvConcerns_{i,t}$$
$$= \alpha + \beta_1 Scientist \mid MBA\ CEO_{i,t-1} + \beta_2 Firm\ Size_{i,t-1}$$
$$+ \beta_3 Firm\ Age_{i,t-1} + \beta_4 Market\ to\ Book_{i,t-1} + \beta_5 ROA_{i,t-1}$$
$$+ \beta_6 Loss_{i,t-1} + \beta_7 Leverage_{i,t-1} + \beta_8 Sales\ Growth_{i,t-1}$$
$$+ \beta_9 R\&D_{i,t-1} + \beta_{10} Tobin's\ Q_{i,t-1} + \beta_{11} Receivables_{i,t-1}$$
$$+ \beta_{12} Board\ Size_{i,t-1} + \beta_{13} Board\ Indep_{i,t-1}$$
$$+ \beta_{14} Inst\ Ownership_{i,t-1} + \beta_{15} Female\ Directors_{i,t-1}$$
$$+ \beta_{16} CEO\ Ownership_{i,t-1} + \beta_{17} CEO\ Age_{i,t-1} + \beta_{18} CEO\ Gender_{i,t-1}$$
$$+ \sum industry_t^i + \sum year_t^i + \varepsilon_{i,t} \tag{1}$$

My model includes both year and industry fixed effects (based on two-digit SIC code industries) to account for any other unobservable factors that might influence the dependent variable. I also follow prior research and employ lagged independent variables (*Scientist CEO* and *MBA CEO* at year t-1) to alleviate concerns over potential reverse causality (Harford *et al.*, 2008; Joecks *et al.*, 2013). One potential source of reverse causality is that firms with poor (better) past environmental ratings may be more inclined to hire scientist CEOs (MBA-educated CEOs). Using lagged independent variables reduces the possibility that such reverse causality is driving the results.

4.3.6. Difference-in-difference models to deal with endogeneity

While I use lagged independent variables to deal with potential endogeneity, this may not suffice by itself. Endogeneity is a potential concern as appointments of CEOs with science or MBA backgrounds are not randomly determined. To deal with this, I employ a difference-in-difference (DID) model to evaluate the impact of a treatment effect (a scientist

CEO replacement for a non-scientist CEO) on a firm's environmental CSR scores. Specifically, treated firms (those that experience a CEO turnover from a non-scientist CEO to a scientist CEO) are compared to control firms (those that experience CEO turnover from a non-scientist to another non-scientist CEO). I compare changes in a firm's environmental CSR scores from before to after a CEO turnover in treated firms and those in control firms. The advantage of using this DID approach is that I can mitigate potential biases that arise from post-turnover comparisons between the treated and control firms due to unobservable time-invariant differences between firms during the pre-turnover period, as well as biases that arise from the before-and-after comparisons in the treated firms that are a result of omitted time-variant variables. I assign a value of one to the dummy variable *Treated* if the firm belongs to the treated sample, and a value of zero to the control firms. I assign a value of one to the dummy variable *Treated* if the firm belongs to the treated sample, and a value of zero to the control firms. The time period dummy, *Post,* takes a value of one for post-turnover years, and otherwise has the value of zero.

I employ a propensity score matching approach to pair-match each firm from the treatment group with a control firm in the same industry and year, using all control variables as covariates to ensure that there are no other significant differences between the treated and control samples. I use the nearest neighbour matching methodology while allowing a maximum difference in propensity score between the treated and control observation (calliper) to be 0.01.[26] I observe the average CSR ratings of the firms before and after the

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[26] I am able to obtain precise matches because there are relatively few treatment observations compared with the large number of control observations available.

turnover over a three-year period (plus or minus one year depending on the timing of the CEO turnover). Using this propensity score matched sample, I estimate Equation (2) below by replacing the *Scientist CEO* variable in Equation (1) with the difference-in-difference estimators, namely *Treated, Post*, and an interaction term of *Treated* and *Post*, to isolate the predictive power of a treatment effect of a turnover from a non-scientist CEO to a scientist CEO in the treated firms, compared to the control firms. Finally, I repeat these difference-in-difference procedures by reversing the nature of the treatment and control groups. Specifically, in my second set of analyses, I propensity-score-match treated firms, which have CEO turnovers from a scientist CEO to a non-scientist CEO, with control firms that have CEO turnovers from a scientist CEO to a scientist CEO, to re-examine the differences in the changes in firms' environmental CSR scores.

In the same way, I replicate the previous propensity-score matching and difference-in-difference models in Equation (2) for MBA-educated CEO turnovers. Specifically, in my third set of analyses, treated firms experience a switch from a non-MBA educated CEO to an MBA-educated CEO while control firms have CEO turnovers from a non-MBA CEO to a non-MBA CEO. Finally, following the difference-in-difference procedures above, I reverse the nature of the treatment and control groups. Specifically, in my final set of analyses, I propensity-score-match treated firms, which have CEO turnovers from a MBA CEO to a non-MBA CEO, with control firms that have CEO turnovers from a MBA CEO to a MBA CEO, to re-examine a treatment effect (a CEO switch from an MBA CEOs to a non-MBA CEO) on the differences in the changes in environmental CSR ratings and engagement.

$$EnvCSR \mid EnvStrengths \mid EnvConcerns_{i,t}$$
$$= \alpha + \beta_1 Treated + \beta_2 Post + \beta_3 Treated * Post$$
$$+ \beta_4 Firm\ Size_{i,t-1} + \beta_5 Firm\ Age_{i,t-1} + \beta_6 Market\ to\ Book_{i,t-1}$$
$$+ \beta_7 ROA_{i,t-1} + \beta_8 Loss_{i,t-1} + \beta_9 Leverage_{i,t-1}$$
$$+ \beta_{10} Sales\ Growth_{i,t-1} + \beta_{11} R\&D_{i,t-1} + \beta_{12} Tobin's\ Q_{i,t-1}$$
$$+ \beta_{13} Receivables_{i,t-1} + \beta_{14} Board\ Size_{i,t-1} + \beta_{15} Board\ Indep_{i,t-1}$$
$$+ \beta_{16} Inst\ Ownership_{i,t-1} + \beta_{17} Female\ Directors_{i,t-1}$$
$$+ \beta_{18} CEO\ Ownership_{i,t-1} + \beta_{19} CEO\ Age_{i,t-1}$$
$$+ \beta_{20} CEO\ Gender_{i,t-1} + \sum industry_t^i + \sum year_t^i$$
$$+ \varepsilon_{i,t} \tag{2}$$

4.4. Empirical Results

4.4.1. Descriptive statistics and Univariate test

Table 4.1 reports the descriptive statistics and correlation matrix of the variables employed in the baseline regression model. Within the sample, 33.1 percent and 33.5 percent of the firm-year observations have a science-educated CEO and an MBA-educated CEO, respectively. The mean industry-adjusted environmental rating is 0.020, and an average sample firm has 0.051 environmental concerns and 0.071 environmental strengths. As reported in the correlation matrix, the Pearson correlation coefficients are all below 0.69, indicating that multicollinearity is not a serious concern. Additionally, all the regressions performed in my study have VIFs below 5.

Table 4.1 Descriptive Statistics and Correlation Matrix

This table presents descriptive statistics and correlations for dependent variables, main variables of interest, and control variables. The superscripts [a], [b], and [c] denote statistical significance at the 1%, 5% and 10% levels, respectively.

	Mean	Std. Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Dependent variables																					
(1) *Env Ratings*	0.020	0.963																			
(2) *Env Concerns*	0.051	0.727	-0.559[a]	1.000																	
(3) *Env Strengths*	0.071	0.821	0.678[a]	0.230[a]																	
Variables of interest																					
(4) *Scientist*	0.331	0.471	-0.042[a]	0.080[a]	0.022[c]																
(5) *MBA*	0.335	0.472	0.041[a]	0.033[a]	0.077[a]	0.096[a]															
Primary Controls																					
(6) *Firm Size*	8.279	1.531	0.065[a]	0.334[a]	0.373[a]	0.021[c]	0.121[a]														
(7) *Firm Age*	10.380	5.315	0.192[a]	0.060[a]	0.279[a]	0.027[b]	0.033[a]	0.289[a]													
(8) *Market-to-book*	2.842	2.771	0.059[a]	-0.029[b]	0.044[a]	0.037[a]	0.017	-0.061[a]	0.052[a]												
(9) *ROA*	0.049	0.070	0.069[a]	0.002	0.083[a]	0.037[a]	0.021[c]	-0.046[a]	0.071[a]	0.319[a]											
(10) *Loss*	0.109	0.312	-0.064[a]	0.006	-0.069[a]	0.006	-0.043[a]	-0.069[a]	-0.040[a]	-0.096[a]	-0.614[a]										
(11) *Leverage*	-1.854	1.256	-0.013	0.097[a]	0.070[a]	-0.035[a]	0.029[b]	0.225[a]	0.068[a]	-0.001	-0.144[a]	0.048[a]									
(12) *Sales Growth*	0.087	0.196	-0.021[c]	-0.037[a]	-0.058[a]	0.035[a]	0.017	-0.048[a]	-0.096[a]	0.091[a]	0.219[a]	-0.204[a]	-0.010								
(13) *Board Size*	9.764	2.311	0.011	0.226[a]	0.213[a]	-0.032[b]	0.092[a]	0.554[a]	0.174[a]	-0.001	-0.012	-0.062[a]	0.153[a]	-0.074[a]							
(14) *Board Indep.*	0.759	0.132	0.053[a]	0.154[a]	0.199[a]	0.060[a]	0.091[a]	0.173[a]	0.194[a]	-0.000	0.019	-0.023[c]	0.052[a]	-0.095[a]	0.074[a]						
(15) *Inst. Ownership*	0.161	0.196	0.064[a]	0.014	0.087[a]	-0.003	0.008	0.195[a]	0.124[a]	0.047[a]	-0.013	0.055[a]	0.103[a]	-0.034[a]	0.065[a]	0.004					
(16) *Female Directors*	0.121	0.092	0.110[a]	0.083[a]	0.203[a]	-0.050[a]	0.099[a]	0.278[a]	0.171[a]	0.081[a]	0.039[a]	-0.040[a]	0.107[a]	-0.119[a]	0.257[a]	0.236[a]	0.081[a]				
(17) *CEO Ownership*	1.561	4.172	-0.034[a]	-0.063[a]	-0.095[a]	-0.062[a]	-0.083[a]	-0.200[a]	-0.027[b]	0.005	0.038[a]	-0.016	-0.105[a]	0.042[a]	-0.157[a]	-0.230[a]	-0.021[c]	-0.114[a]			
(18) *CEO Age*	56.081	6.711	-0.015	0.059[a]	0.035[a]	0.024[b]	-0.005	0.070[a]	0.186[a]	-0.045[a]	0.030[b]	-0.042[a]	0.052[a]	-0.037[a]	0.070[a]	-0.027[b]	-0.030[b]	-0.039[a]	0.192[a]		
(19) *CEO Gender*	0.014	0.119	0.025[b]	0.002	0.031[b]	-0.034[a]	-0.030[b]	-0.015	-0.052[a]	0.012	0.006	0.014	-0.041[a]	-0.016	-0.021[c]	0.031[b]	-0.025[b]	0.177[a]	-0.032[b]	-0.056[a]	

Table 4.2 presents univariates statistics to examine mean differences in corporate environmental CSR ratings and environmental engagement variables when they are sorted across a range of CEO educational backgrounds (*Scientist CEO* and *MBA CEO*). The initial results reveal that firms with scientist CEOs take greater environmental concerns, and experience poorer overall environmental CSR performance than firms with non-scientist CEOs. However, I find no significant difference in environmental strengths between these firms. Conversely, firms with CEOs holding an MBA degree strategically invest more in environmental strengths and achieve better overall environmental CSR ratings than those in firms with non-MBA educated CEOs.

In summary, the univariate results initially support my main hypotheses that scientist CEOs underperform non-scientist CEO in the firms' overall environmental CSR ratings due to firms' being more willing to take greater environmental risks. Meanwhile, MBA-educated CEOs are more risk-averse by engaging in fewer environmental concerns, and thus leading to better overall environmental CSR ratings.

Table 4.2 Univariate Test

This table presents average values and standard deviation of, and mean differences in *Env Ratings*, *Env Constraints* and *Env Strengths* when sorting them by whether or not a CEO is a *Scientist CEO,* and whether or not a CEO is an *MBA CEO*. T-statistics for differences in mean are shown in parentheses.

*, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Sort by	Scientist CEO (#Obs = 10,477)					MBA CEO (#Obs = 10,477)				
	Yes		No		Difference in mean	Yes		No		Difference in mean
	Mean	SD	Mean	SD		Mean	SD	Mean	SD	
Env Ratings	-0.051	1.016	0.026	0.782	-0.077*** (-4.27)	0.051	0.886	-0.025	0.858	0.076*** (4.25)
Env Concerns	0.055	0.811	-0.027	0.571	0.082*** (5.98)	0.015	0.692	-0.007	0.647	0.022 (1.63)
Env Strengths	0.003	0.791	-0.002	0.713	0.005 (0.34)	0.066	0.824	-0.033	0.693	0.099*** (6.45)

4.4.2. Baseline regression results

Table 4.3 reports the results from the panel regressions estimating the effect of a CEO's science and MBA educations on environmental CSR scores and engagements. The results show that *Scientist CEO* is statistically associated with a decrease in overall environmental ratings (*t-statistic* = -3.09) while *MBA CEO* shows a statistically significant increase in the environmental CSR scores (*t-statistic* = 3.07). To determine how economically meaningful it is, given that I use industry-adjusted CSR measures, I examine the extent to which the coefficient leads to a proportional movement across the dispersion (one standard deviation) of the dependent variable's distribution. The *Scientist CEO* coefficient value of -0.086 (Model 1) implies that when a firm has a science-educated CEO, the environmental CSR rating reduces by 8.9 percent of one standard deviation ($\sigma_{EnvRatings}$ = 0.963) from the average industry-adjusted environmental ratings for firms in my sample. In contrast, as reported in Model (4), the coefficient of *MBA CEO* of 0.073 indicates that firms with CEOs with an MBA degree, experience an increase in environmental CSR rating of 7.6 percent of one standard deviation ($\sigma_{EnvRatings}$ = 0.963) from the average industry-adjusted environmental ratings for firms in my sample. These findings support H1 and H2 by indicating that scientist CEOs are associated with poorer overall environmental ratings than non-scientist CEOs. Conversely, CEOs with an MBA education are associated with superior overall environmental CSR performance than non-MBA-educated CEOs.

In addition, I separately examine environmental strengths and concerns. Consistent with H1a and H1b, the coefficient of *Scientist CEO* is statistically associated with more environmental concerns and fewer environmental strengths in Models (2) (*b* = 0.037, *t-statistic* = 1.99) and (3) (*b* = -0.050, *t-statistic* = -2.13). Specifically, when a firm has a

scientist CEO, there is a 5.1 percent rise in average industry-adjusted environmental concerns ($\sigma_{EnvConcerns} = 0.727$) and a 6.1 percent proportional reduction in environmental strengths relative to its standard deviation ($\sigma_{EnvStrength} = 0.821$). These results show that the overall poorer environmental ratings associated with scientist CEOs are attributable to firms' being less willing to invest in developing environmental strengths, as well as an increased exposure to a greater number of environmental concerns.

I replicate the panel regressions on firms' environmental concerns and strengths but focus on the effect of a CEO's MBA education. My results are consistent with H2a but not significantly consistent with H2b. The coefficient of *MBA CEO* is statistically significant and negative with the firms' environmental concerns in Model (5) ($b = -0.044$, *t-statistic* = -2.52). The results imply that firms which are led by an MBA-educated CEO experience a 6.1 percent proportional reduction in environmental concerns relative to its standard deviation ($\sigma_{EnvConcerns} = 0.727$). However, I find no statistically significant increase in environmental strengths ($b = 0.029$, *t-statistic* = 1.51). My findings suggest that CEOs with an MBA education outperform non-MBA CEOs in firms' overall environmental CSR ratings. This better environmental CSR performance is due to MBA CEOs' risk-averse behaviours in committing fewer environmental concerns, but no significant evidence for firms' being willing to invest more in developing environmental strengths.

My evidence provides empirical support for familiarization and self-efficacy theories in the corporate setting (Burger, 1986; Krueger and Dickson, 1994; Millon and Lerner, 2003; Figner and Weber, 2011). CEOs with science-related education, by virtue of their familiarity with a firm's environmental operations and self-perceived expertise, are less likely to invest in engagement with corporate environmental responsibility, as

evidenced by poorer CSR ratings. In contrast, MBA-educated CEOs are more familiar with treating environmental CSR ratings as a strategic business opportunity, thus appear to be more aggressive in pursuing superior environmental CSR performance, as documented by better environmental CSR ratings. However, MBA CEOs become more risk-averse when dealing with additional risks arising from environmental threats, as evidenced by undertaking less risky environmental policies and having fewer environmental concerns.

Table 4.3 CEO Educational Backgrounds and Environmental Ratings

This table presents the results from the regressions using CEO science education to predict environmental CSR scores, concerns, and strengths. All control variables are lagged by one year. Definitions of all variables are contained in the Appendix. Robust standard errors are used in all regression estimations, and t-statistics are reported in parentheses.
*, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable of interest	Env Ratings	Env Concerns	Env Strengths	Env Ratings	Env Concerns	Env Strengths
	(1)	(2)	(3)	(4)	(5)	(6)
Scientist CEO	-0.086***	0.037**	-0.050**			
	(-3.09)	(1.99)	(-2.13)			
MBA CEO				0.073***	-0.044**	0.029
				(3.07)	(-2.52)	(1.51)
Controls						
Firm Size	0.048**	0.185***	0.233***	0.043**	0.187***	0.231***
	(2.20)	(13.54)	(13.78)	(1.97)	(13.48)	(13.74)
Firm Age	0.017***	-0.008***	0.009***	0.017***	-0.008***	0.009***
	(5.77)	(-4.63)	(3.87)	(5.90)	(-4.73)	(3.94)
Market-to-Book	0.008	-0.001	0.007	0.009	-0.001	0.007
	(1.33)	(-0.39)	(1.34)	(1.35)	(-0.42)	(1.35)
ROA	0.722***	0.295*	1.017***	0.704***	0.302*	1.006***
	(3.19)	(1.88)	(5.31)	(3.11)	(1.93)	(5.25)
Loss	-0.058	0.091**	0.033	-0.055	0.089**	0.034
	(-1.21)	(2.45)	(0.90)	(-1.13)	(2.39)	(0.93)
Leverage	0.028***	-0.023***	0.005	0.028***	-0.023***	0.005
	(3.52)	(-4.03)	(0.72)	(3.50)	(-4.03)	(0.73)
Sales Growth	-0.139**	-0.073	-0.212***	-0.147**	-0.069	-0.216***
	(-2.11)	(-1.34)	(-4.20)	(-2.24)	(-1.27)	(-4.28)
R&D	2.970***	-1.342***	1.627***	2.782***	-1.257***	1.525***
	(7.51)	(-5.20)	(4.42)	(7.14)	(-4.84)	(4.26)
Tobin's Q	0.002	-0.010	-0.008	-0.000	-0.009	-0.009
	(0.10)	(-0.85)	(-0.48)	(-0.00)	(-0.76)	(-0.52)

Receivables	-0.287***	0.183**	-0.104	-0.316***	0.198***	-0.118
	(-2.77)	(2.38)	(-1.18)	(-3.02)	(2.59)	(-1.35)
Board Size	-0.007	0.022***	0.015***	-0.007	0.022***	0.015***
	(-1.11)	(3.90)	(3.45)	(-1.11)	(3.92)	(3.46)
Board Indep	-0.248***	0.388***	0.140**	-0.258***	0.394***	0.136**
	(-2.97)	(6.86)	(2.21)	(-3.11)	(7.00)	(2.15)
Inst.Ownership	0.053	-0.126***	-0.073	0.053	-0.127***	-0.073
	(0.79)	(-2.96)	(-1.45)	(0.80)	(-2.97)	(-1.44)
Female Director	0.561***	-0.165**	0.396***	0.546***	-0.154*	0.393***
	(4.04)	(-2.02)	(3.32)	(3.92)	(-1.89)	(3.26)
CEO Ownership	-0.008***	0.009***	0.000	-0.007***	0.008***	0.001
	(-3.14)	(4.11)	(0.28)	(-2.97)	(4.00)	(0.49)
CEO Age	-0.003**	0.001	-0.002*	-0.004***	0.001	-0.002*
	(-2.43)	(1.20)	(-1.76)	(-2.62)	(1.30)	(-1.86)
CEO Gender	0.045	0.092	0.137	0.064	0.082	0.146
	(0.49)	(1.25)	(1.35)	(0.72)	(1.09)	(1.45)
Constant	-0.423**	-1.864***	-2.286***	-0.344*	-1.903***	-2.247***
	(-2.13)	(-13.00)	(-14.33)	(-1.70)	(-13.04)	(-14.14)
N	6,276	6,276	6,276	6,276	6,276	6,276
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.211	0.329	0.325	0.211	0.330	0.325

4.4.3. Difference-in-difference results

The results from the difference-in-difference regressions are reported in Panel A, Table 4.4. The estimated coefficient of *Post* reveals that for firms in my sample there is a general rise in *Env Ratings* ($b = 0.207$, *t-statistic* $= 3.96$) from pre-turnover to post-turnover periods among the control firms, reflecting that CEO turnover is generally a positive event for a firm's environmental ratings, regardless of whether a replacement is a scientist CEO. Importantly, the estimated difference-in-difference coefficient (*Treated*Post*) is negatively associated with *Env Ratings* ($b = -0.164$, *t-statistic* $= 2.43$) in Model (1), highlighting that the changes in environmental ratings from the pre- to post-turnover period in the treated firms (which switch from a non-scientist to a scientist CEO) is 0.164 lower than those in the control firms. The treatment effect (a replacement of a

scientist CEO for a non-scientist CEO) moves a firm's environmental ratings by 17 percent of one standard deviation ($\sigma_{EnvRatings} = 0.963$) below the mean. Overall, my evidence shows that while the event of a CEO turnover, in general, can improve a firm's environmental ratings, if the replacement is a scientist CEO (from a non-scientist CEO), there is a tangible decline in the firm's environmental ratings.

I next separately examine environmental strengths and concerns in Models (2) – (3) of Panel A, Table 4.4. The coefficient of *Treated*Post* is positively related to *Env Concerns* ($b = 0.133$, *t-statistic* = 1.80), but it does not have a strong association with *Env Strengths* ($b = -0.031$, *t-statistic* = -0.61). These results provide support for H1b but not H1a, by indicating that the deterioration in overall environmental ratings is more attributable to increased exposure to environmental concerns, rather than reduced investment in building environmental strengths. This evidence gives support to the argument that scientist CEOs take more environmental risks by increasing firms' exposure to environmental concerns rather than suggesting scientist CEOs invest in fewer eco-friendly initiatives due to professional skepticism.

Conversely, if scientist CEOs underperform non-scientist CEOs in environmental CSR, after a scientist CEO is replaced by a non-scientist CEO, I should observe improvements in firm environmental ratings. To test this conjecture, I repeat the propensity score matching process by pair-matching firms that have undergone a CEO turnover from a scientist to a non-scientist CEO (treated firms), with those firms that are consistently run by scientist CEOs both before and after a CEO turnover. As the *Treated*Post* interaction term captures the treatment effect of a turnover from a scientist to a non-scientist CEO in the treated firms, I would expect it to be positively related to predicting a firm's environmental CSR scores.

I re-estimate the difference-in-difference models and report the results in Panel B, Table 4.4. In Model (1), the coefficient of *Treated*Post*, representing changes from pre- to post-turnover periods between the treated firms that have switched from a scientist CEO to a non-scientist CEO and the control firms which replace a scientist CEO with another scientist CEO, I find a positive improvement in a change of *Env Ratings* (*b* = 0.406, *t-statistic* = 4.45). Further, the results in Models (2) – (3) show that the positive difference in environmental CSR scores from the turnover is attributable to reducing environmental concerns, rather than increasing environmental strengths. Specifically, *Treated*Post* is negatively associated with both *Env Concerns* (*b* = -0.652, *t-statistic* = -5.69) and *Env Strengths* (*b* = -0.246, *t-statistic* = -2.57) in Models (2) – (3), respectively. The difference-in-difference results indicate that non-scientist CEOs, overall, do not invest in building more environmental strengths than scientist CEOs and improve environmental CSR scores by taking fewer environmental concerns.

These results provide further evidence to eliminate the alternative explanation that scientist CEOs underinvest in environmental CSR due to their professional skepticism about greenwashing. Consistent with familiarization and self-efficacy theories, my evidence suggests that scientist CEOs tend to take greater environmental risks, evidenced by a decrease in the number of environmental concerns after a non-scientist CEO replaces a scientist CEO.

I repeat the difference-in-difference analyses for CEO turnovers from a non-MBA CEO to an MBA CEO and further present the results in Panel C, Table 4.4. In Model (1), the coefficient of *Treated*Post*, represents changes from pre- to post-turnover periods between the treated firms that have switched from a non-MBA-educated CEO to an MBA CEO and the control firms which replace a non-MBA CEO with another non-MBA CEO.

The estimated coefficient of treatment effect (*Treated*Post*) is statistically significant and positively associated with *Env Ratings* (*b* = 0.510, *t-statistic* = 2.16) in Model (1), highlighting that the changes in environmental ratings from the pre- to post-turnover period in the treated firms (which switch from a non-MBA to a MBA CEO) is 0.510 greater than those in the control firms. Further, the results in Models (2) – (3) show that the positive difference in environmental CSR scores from the turnover is attributable to reducing environmental concerns, rather than investing in more environmental strengths. Specifically, *Treated*Post* is statistically significant and negatively associated with *Env Concerns* (*b* = -0.434, *t-statistic* = -2.84) but no significantly positive difference in *Env Strengths* (*b* = 0.077, *t-statistic* = 0.49) in Models (2) – (3), respectively. This evidence supports my baseline line regression results, indicating that MBA-educated CEOs are more risk-averse than non-MBA CEOs by taking fewer environmental concerns instead of building more environmental strengths.

The different-in-difference results in Panel D, Table 4.4 provide additional evidence to support the argument that CEOs with MBA education outperform non-MBA CEOs in environmental CSR performance by undertaking more risk-averse environmental policies. I repeat the propensity score matching process by pair-matching firms that have undergone a CEO turnover from an MBA-educated CEO to a non-MBA CEO (treated firms), with those firms that are consistently led by MBA CEOs both before and after a CEO turnover. The coefficient of *Treated*Post* captures the treatment effect (a CEO turnover from an MBA CEO to a non-MBA CEO in the treated firms). The results in Model (1) present the changes in environmental ratings from the pre- to post-turnover period in the treated firms is significantly 0.599 lower than those in the control firms (*b* = -0.599, *t-statistic* = -2.29). Further, the results in Models (2) – (3) show that after MBA CEOs are replaced by non-MBA CEOs, firms are more likely to commit more

environmental concerns but make no significant difference in environmental strengths. Specifically, the coefficient of *Treated*Post* is statistically significant and positively associated with *Env Concerns* (b = 0.684, *t-statistic* = 3.89), but it is not statistically significant with *Env Strengths* (b = 0.085, *t-statistic* = 0.43) in Models (2) – (3), respectively. Overall, the results indicate that non-MBA CEOs underperform MBA CEOs in environmental CSR ratings since they are more willing to take risks by committing more environmental concerns but showing no significant difference in environmental strengths, when compared to MBA-educated CEOs.

Table 4.4 Difference-in-Difference (DID) Analysis

In this table I present the difference-in-difference regressions predicting environmental ratings, concerns and strengths, using a subsample of treatment and control firms that have experienced CEO turnovers, pair-matched using propensity scores and within the same industry-year. In Panel A, the treated firms are those that have experienced a turnover from a non-scientist CEO to a scientist CEO and the control firms are those that have consistently had a non-scientist CEO in before and after the turnover. In Panel B, the treated firms are those that have experienced a turnover from a scientist CEO to a non-scientist CEO and the control firms are those that have consistently had a scientist CEO in before and after the turnover. In Panel C, the treated firms are those that have experienced a turnover from a non-MBA CEO to An MBA CEO and the control firms are those that have consistently had a non-MBA CEO in before and after the turnover. In Panel D, the treated firms are those that have experienced a turnover from an MBA CEO to a non-MBA CEO and the control firms are those that have consistently had an MBA CEO in before and after the turnover. All control variables are lagged by one year. Definitions of all variables are contained in the Appendix. Robust standard errors are used in all regression estimations and t-statistics are reported in parentheses.

*, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: Non-Scientist CEO to Scientist CEO

Variable of interest	*Env Ratings*	*Env Concerns*	*Env Strengths*
	(1)	**(2)**	**(3)**
Post	0.207***	-0.087**	0.119*
	(3.96)	(-2.27)	(1.92)
Treated	-0.046	0.033	-0.013
	(-0.99)	(0.85)	(-0.32)
Treated * Post	-0.164**	0.133*	-0.031
	(-2.43)	(1.80)	(-0.61)
N	1,669	1,669	1,669
Controls	Yes	Yes	Yes
Constant	Yes	Yes	Yes
Adjusted R^2	0.122	0.120	0.270

Panel B: Scientist CEO to Non-scientist CEO

Variable of interest	Env Ratings	Env Concerns	Env Strengths
	(1)	**(2)**	**(3)**
Post	0.040	0.112	0.152
	(0.76)	(1.25)	(1.77)
Treated	-0.254***	0.381***	0.127*
	(-3.16)	(4.88)	(2.02)
*Treated * Post*	0.406***	-0.652***	-0.246**
	(4.45)	(-5.69)	(-2.57)
N	1,125	1,125	1,125
Controls	Yes	Yes	Yes
Constant	Yes	Yes	Yes
Adjusted R^2	0.146	0.281	0.247

Panel C: Non-MBA CEO to MBA CEO

Variable of interest	Env Ratings	Env Concerns	Env Strengths
	(1)	**(2)**	**(3)**
Post	-0.025	0.112	0.087
	(-0.22)	(1.52)	(0.94)
Treated	0.498***	-0.409***	0.089
	(2.51)	(-3.14)	(0.83)
*Treated * Post*	0.510**	-0.434***	0.077
	(2.16)	(-2.84)	(0.49)
N	752	752	752
Controls	Yes	Yes	Yes
Constant	Yes	Yes	Yes
Adjusted R^2	0.386	0.386	0.393

Panel D: MBA CEO to Non-MBA CEO

Variable of interest	Env Ratings	Env Concerns	Env Strengths
	(1)	**(2)**	**(3)**
Post	0.014	-0.061	-0.047
	(0.05)	(-0.53)	(-0.40)
Treated	-0.119	0.291**	0.173
	(-0.50)	(2.54)	(1.29)
*Treated * Post*	-0.599**	0.684***	0.085
	(-2.29)	(3.89)	(0.43)
N	423	423	423
Controls	Yes	Yes	Yes
Constant	Yes	Yes	Yes
Adjusted R^2	0.159	0.211	0.294

4.4.4. CEO personal volition: moderating effects of familial composition

One alternative explanation for my baseline findings is that firms wishing to adopt more aggressive environmental practices deliberately choose to hire scientist CEOs, who have the technical qualification and expertise to further this agenda. In contrast, firms which purse more environmentally friendly policies to enhance firms' performance and reputation, may intend to employ MBA-educated CEOs, who have greater familiarity and competence to recognize and manage corporate environmental CSR as a strategic business opportunity.

To rule out this alternative explanation, I examine the role of CEO's personal values in mitigating the relationship between science and MBA education and environmental CSR. If a scientist CEO is hired to implement a firm's pre-existing agenda to move towards more environmentally aggressive practices, then the CEO's own volition, driven by personal perspectives and circumstances, should not play a significant role in influencing the way in which the CEO carries out the firm's agenda as intended by their hiring committee. In contrast, if my expectation is true that scientist CEOs are motivated by their own familiarity and self-efficacy to take greater environmental risks, I would expect this risk-taking tendency to be moderated by other individual-level circumstances. Similar arguments for MBA-educated CEOs are employed when examining the effects of other CEO personal traits and circumstances on the relationship between MBA education and environmental CSR.

Specifically, Cronqvist and Yu (2017) find that CEOs who have daughters tend to outperform their peers in CSR efforts. The authors attribute this finding to gender socialization theory, which states that women are raised to be more caring towards others

and exhibit greater universalism and benevolence than men (Carlson, 1972; Gilligan, 1977; Adams and Funk, 2012). Cronqvist and Yu (2017) argue that CEOs tend to internalize the value of caring for others, which is more pronounced in girls than boys, through raising daughters. Such value in turn influences the CEO to have superior CSR engagement and to care for stakeholder groups. In light of this prior evidence, I expect that having daughters would mitigate the relationship between science education and poorer environmental CSR engagements. In contrast, I expect that the effect of MBA education on environmental CSR would be more pronounced when CEOs have daughters.

To test these propositions, I collect information about CEOs' children from the Marquis Who's Who Online Database. I compute a binary variable, *Daughter*, which equals one if the CEO has one or more daughter(s) and zero otherwise. I then divide my observations into two subsamples: firm-years where scientist CEOs have daughters versus those with no daughters. I then re-estimate my baseline regressions in Equation (1) using each subsample. I repeat the empirical procedure for two subsamples of firm-years where MBA-educated CEOs have a daughter against those with no daughter.

In Panel A, Table 4.5, I report the regression results using the subsample where scientist CEOs do *not* have daughters in Models (1) – (3), and the results using the subsample where scientist CEOs have daughters in Models (4) – (6). As reported in the no-daughter subsample, the coefficient of *Scientist CEO* is statistically significant and associated with worse overall environmental ratings (b = -0.669, *t-statistic* = 1.88) and fewer environmental strengths (b = -0.826, *t-statistic* = -3.03). There is no meaningful association with environmental concerns (b = -0.157, *t-statistic* = -1.54). In contrast, when the regressions are re-run using a subsample of firm-years where scientist CEOs

have daughters in Models (4) – (6), the coefficient of *Scientist CEO* is no longer associated in predicting worse *Env Strengths* (*b* = -0.030, *t-statistic* = -0.27) in Models (5). Moreover, the economic magnitude of the coefficient of *Scientist CEO* in predicting *Env Ratings* (*b* = -0.192, *t-statistic* = -1.74) in Model (4) represents a 28.7 percent decline in the economic magnitude relative to the estimated coefficient in Model (1). Taken together, these results show that the negative impacts of having a scientist CEO on firm environmental CSR are reduced when the CEO has a daughter.

In Panel B, Table 4.5, I present the regression results for MBA-educated CEOs in two subsamples including MBA CEOs without daughters (Models 1 – 3) and those with daughters (Models 4 – 5). In the no-daughter sample, I find no statistically significant effect of having an MBA-educated CEO on a firm's overall environmental CSR, environmental concerns and strengths in Models (1) – (3). In contrast, in the having-daughter sample, the coefficient of *MBA CEO* is statistically significant and associated with a reduction in *Env Concerns* (*b* = -0.142, *t-statistic* = -2.47) and an improvement of *Env Strengths* (*b* = 0.131, *t-statistic* = 2.52) in Models (5) – (6), respectively. Moreover, as reported in Model (4), the coefficient of *MBA CEO* is positive and statistically significant with *Env Ratings* (*b* = 0.273, *t-statistic* =3.73), indicating the positive effects of leading by an MBA-educated CEO on environmental CSR are pronounced when the MBA CEO has a daughter.

While I cannot rule out that some scientist CEOs (and MBA CEOs) are deliberately selected to lead firms towards more aggressive (more risk-averse) environmental policies and practices, I find no evidence of this when I analyse my data *en-masse*. In contrast, my results show that a CEO's personal ethics, derived from raising daughters, play a significant role in offsetting (pronouncing) the effect of having a science-related

education, (an MBA education). This indicates that the relationship between scientist CEOs (MBA CEOs) and worse (better) environmental CSR ratings is attributable to the CEOs' own perspectives and assumptions as developed through their educational backgrounds, consistent with upper echelons theory, rather than driven by firms' pre-existing agendas towards environmental CSR as manifested through the selection of scientist CEOs or MBA CEOs.

The above results further shed light on the possible mechanisms that explain why firms led by scientist CEOs receive poorer environmental ratings. If the worse environmental ratings are due to scientist CEOs refraining from investing in environmental strengths because they perceive such initiatives to be mere greenwashing, then having a daughter should not make any difference to a CEO's professional skepticism and hence to their inclination to invest in environmental CSR. In contrast, if scientist CEOs tend to take greater environmental risks due to their own psychological factors including familiarity and self-perceived expertise, then other CEO personal idiosyncrasies (such as their values developed from the socialization process of raising daughters (Cronqvist and Yu, 2017)) are expected to mitigate the effects of their science education. My results are consistent with this second view, by indicating that CEOs' family composition of having daughters indeed mitigates the negative effects of their scientist education on the firms' environmental CSR ratings.

Similarly, my findings provide a potential explanation why firms run by MBA-educated CEOs achieve better environmental CSR. If MBA CEOs improve a firm's overall environmental ratings by investing more in developing environmental strengths such as green-washing strategies, I then expect having a daughter would have a negative impact on a firm's demand for green-washing, and thus would also reduce the number of

environmental strengths and lead to poorer environmental ratings. Conversely, if an MBA education creates personal psychological impacts on an MBA CEO's risk-averse behaviours to take fewer environmental risks, I then expect that other CEO personal perspectives and circumstances (such as their values of female socialization developed from parenting daughters) may have a moderating effect on the level of CEO's risk-taking. Overall, my results support the second argument, by indicating that CEOs' family composition of having a daughter strengthens the positive effects of their MBA education on the firms' environmental CSR.

Table 4.5 Moderating Effects of CEO Familial Composition

This table presents regression results from the subsample analyses that examine the additional effect of CEO having daughters on the existing effect of CEO educational backgrounds on environmental CSR ratings, concerns, and strengths. Panel A presents the role of scientist CEOs having daughters in mitigating the predictive power of CEO scientist education. Panel B presents the role of MBA CEOs having daughters in strengthening the predictive power of CEO MBA education. In each panel, Models (1) – (3) report the results from the regressions estimated using a subsample of firms where scientist CEOs have no daughters. Models (4) – (6) report the results from the regressions estimated using a subsample of firms where the scientist CEOs have daughters. All control variables are lagged by one year. Definitions of all variables are contained in the Appendix. Robust standard errors are used in all regression estimations and t-statistics are reported in parentheses.

*, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: Scientist CEO

Variable of interest	Scientist CEOs having no daughters			Scientist CEOs having daughters		
	Env Ratings	*Env Concerns*	*Env Strengths*	*Env Ratings*	*Env Concerns*	*Env Strengths*
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Scientist CEO	-0.669*	-0.157	-0.826***	-0.192*	0.162	-0.030
	(1.88)	(-1.54)	(-3.03)	(-1.74)	(1.50)	(-0.27)
N	298	298	298	925	925	925
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.397	0.684	0.507	0.283	0.447	0.371

Panel B: MBA CEO

Variable of interest	MBA CEOs having no daughters			MBA CEOs having daughters		
	Env Ratings	*Env Concerns*	*Env Strengths*	*Env Ratings*	*Env Concerns*	*Env Strengths*
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
MBA CEO	-0.023	-0.071	-0.093	0.273***	-0.142**	0.131**
	(-0.10)	(-0.40)	(-0.62)	(3.73)	(-2.47)	(2.52)
N	298	298	298	925	925	925
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.353	0.682	0.407	0.290	0.446	0.375

4.5. Discussion and Conclusion

An extensive literature on upper echelons theory shows that CEO personal background and experiences play an important role in shaping corporate policies and outcomes (Hambrick and Mason, 1984; Barker and Mueller, 2002; Carpenter *et al.*, 2004; Hambrick, 2007). Yet despite the growing importance of corporate environmental responsibility, very little research has examined CEO education on corporate environmental policies and performance. I fill this gap in the literature by producing evidence on the extent to which science-educated CEOs and MBA-educated CEOs engage with environmental CSR and how well they perform in overall environmental CSR ratings. My study extends upper echelons theory by establishing a link between CEO education in science and MBA educations and corporate environmental policies and engagements, which is hitherto uninvestigated. Using a sample of S&P 1500 firms, I examine firms' overall environmental CSR ratings, and separately observe firm-level

environmental engagement, which is captured via both environmental concerns and environmental strengths.

I extend psychological theories of familiarization and self-efficacy (Flanders and Thistlethwaite, 1967; Krueger and Dickson, 1994; Millon and Lerner, 2003) by demonstrating their applications in the corporate upper echelons setting. I build upon familiarization and self-efficacy theories to develop a theoretical framework that extends upper echelons theory by postulating that CEO education constitutes a significant predictor of risk-taking in the CEO's self-perceived area of expertise. Consistent with this framework, my results show that firms led by scientist CEOs take greater environmental risks and have poorer engagements with environmental CSR. In contrast, I find evidence that MBA-educated CEOs outperform non-MBA CEOs in environmental CSR ratings due to their risk-aversion in formulating less risky environmental policies and practices by committing fewer environmental concerns.

My findings offer practical implications for corporate executives and directors in relation to both CEO selection and subsequent executive training. First, my evidence provides important insights into psychological factors that influence CEO decision-making, which can inform the development of executive training programs. Specifically, consistent with familiarization and self-efficacy theories (Flanders and Thistlethwaite, 1967; Krueger and Dickson, 1994; Millon and Lerner, 2003), CEOs are more likely to take greater risks in their areas of expertise. Consequently, my results provide useful insights into designing executive training programs and ongoing support, to increase executives' self-awareness of such tendencies. Such training programs can benefit the firm by ensuring that any increased risk-taking in the CEOs' areas of expertise is chosen consciously and rationally and to avoid subconscious hubris.

Furthermore, CEO selection is one of the most important decisions that a board of directors can make. My findings highlight the significant and multi-faceted impacts of CEO education on corporate policies and performance in the areas of the CEO's expertise. These findings help members of CEO selection committees to match CEOs' educational backgrounds with a firm's desired future strategic direction. For example, if a firm wishes to adopt riskier strategies in a particular area of operation, it can benefit from hiring a CEO with expertise in that area, as such a CEO may be more willing to take risks. Conversely, MBA-educated CEOs are aggressive at pursuing superior environmental CSR performance by formulating more environmentally friendly policies and practices. However, it is important to ensure that any changes in the level of risk-taking result from deliberate strategic choices in alignment with the firm's vision, rather than mere by-products of the CEO's own psychological inclinations arising from familiarity and self-perceived expertise.

While I document CEO science and MBA educations as potent predictors of corporate environmental engagement and performance, my study nonetheless has limitations which offer opportunities for future research. In particular, this study design does not distinguish between firms' environmental CSR engagement ratings and firms' actual environmental outcome and actual corporate environmental performance, such as corporate environmental lawsuits. The usage of commercial CSR ratings (such as KLD scores which are based on binary ratings) might be limited to provide a more-in-depth measure of the nature and extent of environmental violations committed by a firm. Future studies may be interested in expanding my research to examine whether CEO science and MBA educations may affect CEO's capacity to manage the increased level of environmental risks to avoid negative consequences in form of corporate environmental lawsuits.

Moreover, this study design does not investigate the practical avenues through which scientist CEOs and MBA CEOs pursue the desired level of environmental risks. There are two common mechanisms for a CEO to influence corporate conduct, through explicitly changing corporate policies or implicitly influencing firm culture. For example, a scientist CEO may be more likely to foster a culture of thoroughness, exactness, and attention to detail in the technical areas of the firm's operations, which in turn may enhance the firm's ability to navigate the increased level of environmental risks associated with having more CSR concerns (e.g. Davidson et al. (2015); Hutton et al. (2015)).

In addition, the scope of my investigation is limited to CEOs. I do not examine whether managers at other levels of management throughout a firm's hierarchy also exhibit similar increases in risk-taking tendencies and risk-management abilities in their areas of expertise. Such an examination is potentially important, as the findings can assist practitioners with managerial appointment decisions, specifically to ensure cohesion in risk perceptions across managers at different levels, to prevent unnecessary risk-taking due to self-perceived expertise, and to make the best use of managers with specialized training by matching their qualifications with high-risk areas of operations. The novel theoretical framework, which is developed by drawing on familiarization and self-efficacy theories in this study, enables future researchers to conduct these lines of enquiry.

CHAPTER 5

CONCLUSION

This dissertation contributes to the growing body of work with two studies that explore novel aspects of personal managerial traits, and investigate the influence of these CEO personal idiosyncrasies on corporate decision-making in financial reporting and environmental responsibility. From a theoretical perspective, this thesis provides two novel theoretical frameworks. The first framework is constructed from both psychology and economic theories to model a utility-maximizing function of a CEO with different levels of altruism preferences in their decision-making regarding committing corporate misdeeds in financial reporting. The second utilises familiarity and self-efficacy theories to explain the relationship between CEO educational background and their risk-taking behaviours in formulating environmental policies. From an empirical perspective, this thesis provides two novel empirical studies which have not been previously explored. The first study and its extended study provide unique empirical measures of personal managerial altruism by observing CEO stock donations and other CEO psychological idiosyncrasies and opportunistic incentives in making donations. The second study introduces further evidence on how CEO educational background can explain the heterogeneity of corporate environmental engagement. My findings in this thesis also offer practical implications for corporate executives and boards of directors in relation to the benefits of CEO selection and subsequent executive training programs which aim to diminish corporate wrongdoing in financial reporting and to enhance corporate environmental engagement and overall CSR performance. The remainder of this chapter

consists of a summary of findings and contributions from each study, research limitations and directions for future research.

5.1 Summary and Contributions

In Chapter Two, the first study examines whether the personal altruism of CEOs has an impact on diminishing corporate malfeasance in financial reporting. I proxy for the personal managerial altruism of CEOs by observing the number of stocks donated by CEOs to charitable organisations. I examine the effect of CEO altruism on three sorted forms of corporate malfeasance in financial reporting from the most serious (corporate fraud) to intermediate (real activities management), to least serious (accruals earnings management), based on the costs and associated risks of each form of earnings manipulation. Given the heterogeneity in stock donations, I further identify and measure different levels of CEO altruism by examining whether CEOs make stock donations with personal financial motives including backdating and tax-planning incentives around the timing of gifting stocks. I first design a theoretical framework modelling a utility-maxing function of executives with/without altruistic preferences in their decision-making to manipulate earnings, and then conduct panel baseline regressions to empirically examine my hypotheses.

The theoretical framework predicts altruistic CEOs are less likely to manipulate earnings and the probability of committing earnings manipulation is negatively associated with the level of personal managerial altruism of CEOs. Moreover, the empirical regression results also suggest that firms run by CEOs with altruistic preferences, as captured by their stock donations, are less likely to commit financial fraud

and exhibit lower levels of real and accrual-based earnings manipulation. These effects are more pronounced for CEOs who do not backdate when making stock donations and who donate stocks outside of the tax season. To eliminate potential endogenous biases in my estimated results, I conduct several robustness checks, including employing the dummy and ratio of CEO stock donations, examining the effect of CEO turnovers, using difference-in-difference models, applying an instrumental variable approach, and using alternative measures of CEO altruism. Overall, the results suggest that personal altruism of managers has a disciplining effect on corporate malfeasance in financial reporting.

The first study contributes a novel theoretical framework which models CEO altruism as a personal psychological factor which explains corporate wrongdoing in financial reporting. Moreover, this study also provides novel empirical evidence that highlights the "bright-side" effect of hiring altruistic CEOs to diminish corporate financial reporting malfeasance. My findings also offer practical implications for corporate executives and boards in relation to CEO selection, and methods to minimise corporate losses and to protect shareholders' wealth from corporate financial misconduct.

Chapter Three presents a two-way research extension of the first study. The first extension in this chapter addresses potential measurement error of CEO altruism by observing other personal philanthropic activities in society of CEOs and other opportunistic incentives when CEOs make stock donations. I extend the primary explanatory variable of CEO stock donations in the first study into the five new alternative proxies of CEO altruism including (i) CEO receiving humanitarian awards; (ii) charitable recipients of CEO stock donations; (iii) CEO political cash contributions with altruistic preferences; (iv) CEO non-timing stock donations before negative earnings announcements or after positive earnings announcements; and (v) CEO stock donations

non-after a run-up of stock awards. The findings show that firms with CEOs who have received a humanitarian award, are less likely to commit fraud and have lower abnormal real activities management and abnormal accruals. The results remain consistent for real activities and accruals management, but are not significant for corporate fraud when using charitable recipients and CEO political cash donations to proxy for CEO altruism. In addition, the results hold for accruals management and corporate fraud but no evidence is found for real activities manipulation when regressing for the non-timing patterns of CEO stock donations around earnings announcements and non-after a run-up of stock awards. Overall, my findings in this extended study provide a novel empirical methodology to identify and capture various forms of CEO altruism, other than that captured via the use of CEO stock donations as a proxy. The overall results also highlight the positive effect of CEO personal altruism in diminishing various forms of corporate malfeasance in financial reporting, after addressing all potential endogenous measurement error of CEO altruism.

The second part of this chapter extends the research of the CEO-altruism effect on the readability of a firm's annual financial report. I measure financial reporting readability by borrowing data on the Bog Index from Bonsall IV et al. (2017). In the empirical analysis, I replicate all earlier baseline regressions in Chapter Two and turn my attention to the effect of CEO altruism on financial report readability. The results in this extended study reveal that financial reports are more comprehendible for firms with altruistic CEOs. Moreover, firms led by CEOs who make stock donations without personal financial motives (non-backdating and/or non-tax-planning incentives) have a greater improvement in the readability of financial reports, compared to firms run by CEOs who backdate and consider tax-planning incentives when gifting stock. Overall, my findings in this extended study contribute novel empirical evidence that hiring a CEO with

altruistic preferences may be a potent determinant of an improvement in the readability and comprehension of financial statements, a research area which has not been previously investigated.

In Chapter Four, the second study investigates the influence of CEO educational background on corporate environmental CSR performance and engagement. Specifically, building on the familiarity and self-efficacy theories, this study posits that science-educated CEOs possess greater familiarity and self-perceived expertise in dealing with the technological aspects in environmental matters. Scientist CEOs thus are confident to take greater environmental risks which, in turn, lead to a poorer overall environmental CSR performance. Conversely, MBA-educated CEOs are more aggressive in pursuing better environmental CSR performance because MBA CEOs are well-trained to perceive and interpret environmental CSR engagement as a business strategy to enhance a firm's performance and minimize potential shareholder losses from the risks of corporate environmental infringements.

In the empirical analysis, I first run panel least squares regressions of scientist CEO and MBA CEO on overall environmental CSR ratings and engagement in environmental strengths and concerns, respectively. The baseline results show that the overall poorer environmental ratings associated with scientist CEOs are attributable to firms being less willing to invest in developing environmental strengths, as well as an increased exposure to a greater number of environmental concerns. In contrast, firms led by MBA-educated CEOs are associated with better overall environmental CSR performance and commit fewer environmental concerns. To address potential reverse causality bias in the estimated results, I conduct difference-in-difference analyses utilizing CEO turnovers to highlight the impacts of CEOs educational background on corporate environmental

ratings and engagement. The results suggest that firms are associated with poorer overall environmental performance when a non-scientist CEO is replaced by a scientist CEO, and vice versa. In contrast, a treatment effect of replacing a non-MBA CEO by an MBA CEO has a positive effect on overall environmental CSR ratings, and vice versa. Moreover, the robustness results also indicate that a CEO's personal ethics, derived from parenting daughters, play a significant role in offsetting (pronouncing) the effect of having a science-related education (MBA education).

Overall, this study highlights that CEO educational background can be a potent predictor of the heterogeneity in firm environmental CSR performance and engagement. Specifically, my findings not only suggest that scientist CEOs underperform non-scientist CEOs in the firm's overall environmental CSR ratings, but also offer a potential explanation that worse environmental ratings are due to scientist CEOs tending to take greater environmental risks rather than refraining from investing in environmental strengths. In contrast, MBA-educated CEOs outperform non-MBA CEOs because MBA CEOs are more risk-averse in taking additional environmental risks rather than undertaking green-washing strategies by investing more in developing environmental strengths. Moreover, this study also offers practical implications for corporate executives and directors in relation to top management selection and firm executive training programs.

5.2. Limitations and Future Research

I acknowledge a number of limitations in each study and suggest future areas of research. The first limitation revolves around the employment of data on CEO personal

characteristics from the Marquis Who's Who database. Although previous literature presents an increase in the use of the Marquis database to capture data on personal traits of executives (Parrino, 1997; Palia, 2000; Huson et al., 2001; Hwang and Kim, 2009; Cronqvist and Yu, 2017; Lee et al., 2017; Gounopoulos and Pham, 2018), this database may sometimes contain incomplete or self-reported information on executives. To address missing information from the Marquis database, I also access other databases, including Wikipedia, Notable Names Database, the search engines to do across data checks. While I may not eliminate all potential biases from using this database, the Marquis Who's Who is suggested as one of the most comprehensive databases providing personal biographical details on CEOs (Cronqvist and Yu, 2017). Future research may be encouraged to discover additional alternative databases which would contain more-in-depth and objective personal biographical information on corporate executives. Alternatively, future studies may also develop theoretical research on various managerial-specific traits instead of conducting empirical studies to overcome these potential data biases.

In addition, the scope of my investigation is limited to CEOs. I do not examine whether managers at other levels of management throughout a firm's hierarchy also similarly exhibit personal managerial altruism and risk-taking tendencies in their areas of expertise. Some scholars, for example, investigate the impact of CFOs' personal styles on corporate financial and accounting policies (Jiang et al., 2010; Ge et al., 2011). Thus future research could extend my work by examining personal altruisms and differences in educational background across other top corporate executives and directors to further capture the influence of personal altruism and risk perceptions at different corporate levels on corporate culture and decision-making.

Motivated by my study, future research could also investigate how alignment in altruistic behaviour between top management and directors, as reflected by their stock donations, may affect corporate financial policies and governance. Building on my findings, shared altruistic values between CEOs and directors may promote more ethical behaviours between executives and directors, and thus may reduce corporate misconduct because both altruistic CEOs and directors align to maximise firm value and the well-being of stakeholders and shareholders.

Last but not least, the research design in the second study on CEO educational background does not distinguish between corporate environmental CSR performance and corporate actual environmental performance, such as that captured by corporate environmental lawsuits. The use of corporate CSR ratings might be limited to provide a more-in-depth measure of the nature and extent of environmental violations committed by a firm. Further research may be interested in expanding on my results to examine whether scientific and MBA educations of CEOs can affect their capacity to manage environmental risks to avoid some of the negative consequences arising in the form of corporate environmental lawsuits.

Appendix A – Chapter 2

Variable	Definition
A. CEO stock donations	
DumDonate	CEO stock donation dummy equal to one if a firm's CEO has stock donations reported to the SEC in a given fiscal year (zero otherwise)
#Donate	Number of reported CEO stock donations in a given fiscal year
DonateRatio	Ratio of CEO donated shares to CEO total shares in a firm in a given fiscal year
NonBackdate	CEO non-backdating dummy equal to one if a CEO has all of their stock donations non-backdated (zero otherwise)
NonTaxplanning	CEO non-tax planning dummy equal to one if a CEO did not tax plan any of their stock donations (zero otherwise)
Non-(Backdate & Taxplanning)	Interaction of CEO non-backdating and CEO non-tax planning (*NonBackdate* * *NonTaxplanning*)
B. Fraud & earnings management	
Fraud	Dummy of SEC AAER frauds equal to one if a firm is recorded as the subject of a financial fraud in a given fiscal year (zero otherwise)
DisAcc	The absolute value of discretionary accruals, where discretionary accruals are computed using the Jones (1991) model
RealActMan	The absolute value of combined abnormal operating cash flows, production costs, and discretionary expenses (Roychowdhury, 2006)
BogIndex	A measurement of financial reporting readability, sourced from Bonsall IV et al. (2017)

C. Firm characteristics

Size   Natural logarithm of the market value of equity (MVE)

Age   Natural logarithm of one plus the number of years the firm has been in COMPUSTAT

Leverage   Ratio of long-term debt and debt in current liabilities to book value of assets ($DLTT + DLC$)/AT

ROA   Operating income before depreciation divided by total assets *(OIBDP/AT)*

CAPEX   Capital expenditures net of sales of plant, plant, property, and equipment scaled by total assets (*PPENT/AT*)

Intangibles   Ratio of sum of research, development and advertising expenses to total assets *(XRD+XAD)/AT*

Ln (Operating cycle)   Natural logarithm of firm's operating cycle calculated as
$$\ln((360/(SALE_{i,t}/(RECT_{i,t}+RECT_{i,t-1})/2)))+(360/(COGS/((INVT_{i,t} + INVT_{i,t-1})/2))))).$$

Inventory   Ratio of inventory to total assets (*INV/AT*)

Receivables   Ratio of receivables to total assets (*RECT/AT*)

SalesVol   Standard deviation of sales (*SALE*) scaled by total assets (*AT*) over the prior 2 years

CFOVol   Standard deviation of cash flows from operation (*OANCF-XIDOC*) scaled by total assets (*AT*) over the prior 2 years

D. Corporate governance

Inst. Ownership   The fraction of outstanding shares owned by institutional investors

BoardIndep   The fraction of total independent directors to total number of directors

CEO Ownership   The fraction of total shares held by CEOs

E. Donating CEO turnover

DonateCEO   Dummy for donating CEO turnover equal to one if (i) a CEO has donated in at least 50% of the years during their CEO tenure, and (ii) their firm experiences a turnover from a CEO likely to donate to one less likely to donate, or vice versa.

F. CEO personal characteristics

Daughter   Dummy equal to one for firms whose CEO has a female child (including stepchildren) (zero otherwise)

Childcare   Dummy equal to one for firms whose CEO engages in chid-caregiving activities (zero otherwise)

Appendix B – Chapter 3

Variable	Definition
A. CEO stock donations	
DumDonate	CEO stock donation dummy equal to one if a firm's CEO has stock donations reported to the SEC in a given fiscal year (zero otherwise)
#Donate	Number of reported CEO stock donations in a given fiscal year
DonateRatio	Ratio of CEO donated shares to CEO total shares in a firm in a given fiscal year
NonBackdate	CEO non-backdating dummy equal to one if a CEO has all of their stock donations non-backdated (zero otherwise)
NonTaxplanning	CEO non-tax planning dummy equal to one if a CEO did not tax plan any of their stock donations (zero otherwise)
Non-(Backdate & Taxplanning)	Interaction of CEO non-backdating and CEO non-tax planning (*NonBackdate* NonTaxplanning*)
B. Corporate fraud, Earnings management, and readability	
Fraud	Dummy of SEC AAER frauds equal to one if a firm is recorded as the subject of a financial fraud in a given fiscal year (zero otherwise)
DisAcc	The absolute value of discretionary accruals, where discretionary accruals are computed using the Jones (1991) model

RealActMan	The absolute value of combined abnormal operating cash flows, production costs, and discretionary expenses (Roychowdhury, 2006)
BogIndex	A measurement of financial reporting readability, sourced from Bonsall IV et al. (2017)

F. CEO personal characteristics

Humani	Dummy equal to one for firms whose CEO has received a humanitarian award (zero otherwise)

G. Alternatives of CEO altruism

Charitable Recipients	Dummy equal to one if the recipients of CEO stock donations are external charitable organizations (zero otherwise)
BeforePostive&AfterNegative	Dummy equal to one if a CEO donates stock within five trading days preceding a positive earnings announcement, or a stock gift is made on the day or the four days following a negative earnings announcement, and zero if he donates within five days before a negative earnings announcement, or on the earnings date and continuing four days after a positive earnings announcement (zero otherwise)
Non-after run-up	Dummy equal to one for firms whose CEO donates stocks even when receiving no stock awards or a relatively small amount of stock awards (in dollar value) in the same fiscal year, and zero if CEO makes stock donations after receiving a significantly large amount of stock awards (in dollar value) in the same fiscal year.
Altruistic Political Donation	Dummy equal to one if a CEO make individual cash donations of $200 or more to a political

party/committee which primarily supports for family, child, female, elderly, health care, environment, education, or animal welfare issues (zero otherwise)

G. Alternatives of CEO altruism

Charitable Recipients

Dummy equal to one if the recipients of CEO stock donations are external charitable organizations (zero otherwise)

BeforePostive-AfterNegative

Dummy equal to one if a CEO donates stock within five trading days preceding a positive earnings announcement, or a stock gift is made on the day or the four days following a negative earnings announcement, and zero if he donates within five days before a negative earnings announcement, or on the earnings date and continuing four days after a positive earnings announcement (zero otherwise)

Non-after run-up

Dummy equal to one for firms whose CEO donates stocks even when receiving no stock awards or a relatively small amount of stock awards (in dollar value) in the same fiscal year, and zero if CEO makes stock donations after receiving a significantly large amount of stock awards (in dollar value) in the same fiscal year.

Altruistic Political Donation

Dummy equal to one if a CEO make individual cash donations of $200 or more to a political party/committee which primarily supports for family, child, female, elderly, health care, environment, education, or animal welfare issues (zero otherwise)

Appendix C – Chapter 4

Variable	Definition
A. Environmental Performance	
Env Ratings	Industry-adjusted overall corporate social responsibility (CSR) scores on environmental issues in year t.
Env Concerns	Industry-adjusted number of environmental CSR concerns in year t.
Env Strengths	Industry-adjusted number of environmental CSR strengths in year t.
B. CEO educational background	
Scientist CEO	Dummy variable that equals one if the CEO holds a degree in fields related to science, technology, engineering and math (STEM) in year $t–1$ and zero otherwise.
MBA CEO	Dummy variable that equals one if the CEO holds an MBA degree in year $t–1$ and zero otherwise.
C. Firm characteristics	
Firm Size	Natural logarithm of total assets in year $t–1$.
Firm Age	Natural logarithm of one plus the number of years (as at year $t–1$) since the firm's first appearance in the Compustat Database.
Market-to-Book	Market value of equity divided by book value of equity in year $t–1$.
ROA	Net income divided by total assets in year $t–1$.
Loss	Dummy equal to one if return on assets is negative and zero otherwise in year $t–1$.

Leverage	Ratio of long-term debt and debt in current liabilities to book value of assets in year t–1.
Sales Growth	Growth rate of sales from year t–1 to year t.
R&D	Ratio of sum of research and development expenses to total assets in year t–1.
Tobin's Q	Ratio of sum market value of equity and liabilities divided by total assets in year t–1.
Receivables	Ratio of receivables to total assets in year t–1.

D. Corporate governance

Board Size	The total number of board directors in year t–1.
Board Indep	The fraction of total independent directors to total number of directors in year t–1.
Inst. Ownership	The fraction of outstanding shares owned by institutional investors in year t–1.
Female Director	The fraction of total female directors to total number of directors in year t–1.
CEO Ownership	The fraction of total shares held by the CEO in year t–1.

E. CEO personal characteristics

CEO age	Current age of the CEO in year t–1.
CEO gender	Dummy equal to one if a firm's CEO is male in year t–1and zero otherwise.
Daughter	Dummy equal to one for firms whose CEO has a female child (including stepchildren) and zero otherwise.

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