Essays on CSR Contracting

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Submitted in accordance with the requirements for the degree of Doctor of Philosophy in Business and Economic Studies (Accounting and Finance)

The University of Leeds
Leeds University Business School
Centre for Advanced Studies in Finance

October 2023

Intellectual Property and Publication Statements

The candidate confirms that the work submitted is his own and that appropriate credit has been given where reference has been made to the work of others.

Acknowledgement

I am deeply grateful to my supervisory team for their invaluable guidance, knowledge sharing, advice, and diligent monitoring throughout this journey. Professor Kevin Keasey's, Professor Jie Chen's, and Dr Danilo Mascia's unwavering dedication has been instrumental in shaping this thesis. Without their efforts and commitment, completing this thesis would have been an insurmountable challenge. I have gleaned a wealth of knowledge from them, learning not only how to gather research data, write scholarly papers, and navigate the publishing process, but also how to manage stress effectively. Collaborating with them on research projects has been a privilege for me.

I extend special thanks to Mrs Michelle Dickson for her unwavering support throughout my entire PhD process. Her administrative guidance and encouragement, especially during the difficult times of the COVID-19 pandemic, have been indispensable. I wish her a remarkable journey in her new role at the university.

I am indebted to the Business School and the CASIF for their generous funding and excellent facilities. The availability of online data, reading materials, conferences, and research training has been vital to the completion of my PhD research.

My gratitude also extends to the CASIF community, where I found wonderful friends who shared their experiences and insights, helping me enhance my work and view research questions from diverse perspectives.

I extend heartfelt appreciation to other academic members of CASIF, including Professor Bin Xu, for their invaluable suggestions and recommendations that have significantly enriched the quality of this research.

Finally, my deepest gratitude is reserved for my beloved father, Huy, my cherished mother, Ha, my sister, Linh, my love, Van Thanh, and my dearest friend, Duy Kien. They have provided me with unwavering emotional support, love, encouragement, and motivation to continually better myself and strive towards completing this PhD journey. With the completion of this thesis, I hope to have brought pride to my family and loved ones.

Abstract

Incorporating CSR metrics into executive compensation, known as CSR contracting, is an innovative strategy for rewarding CSR performance, with less-explored economic implications despite its growth. This thesis addresses this void by constructing a unique dataset concerning CSR contracting adoption in S&P 500 companies, spanning 2000 to 2018. We analyse three interconnected questions, investigating the influence of CSR contracting on managerial choices and firm outcomes, thereby contributing to discussions on its governance effectiveness.

The thesis initiates with an empirical investigation into the impact of CSR contracting on share repurchase decisions. Results suggest that incentivised CEOs are inclined to curtail and avoid repurchasing shares. The moderating effect of CSR contracting on repurchases is more substantial for firms with more investment opportunities and higher cash flow volatility. Regarding dividend policy, incentivised CEOs neither reduce dividends as with share repurchases nor raise dividend payouts from saved repurchase funds, indicating no direct impact of CSR pay on dividend policy.

The second empirical chapter examines the influence of CSR contracting on managerial risk-taking. We find that CSR contracting adopters exhibit reduced volatility compared to non-adopters, suggesting that incentivised CEOs take a more cautious approach to balance risk preferences between shareholders and stakeholders. CSR pay is more effective when firms are highly financially constrained and reside in areas with higher levels of social capital. Further analyses reveal more conservative financial and investment policies adopted by incentivised CEOs, along with enhanced operational and stock performance for CSR contracting adopters, especially during high market volatility.

The third empirical chapter explores CSR contracting's impact on managerial bad news hoarding, measured by stock price crash risk. Our findings uncover a notable trend: CSR contracting adopters exhibit a decreased level of crash risk. The moderating effect of CSR contracting on crash risk is more pronounced for firms that rely significantly on stakeholder claims, have greater earnings volatility, and reside in US counties with elevated religiosity. Exploring the underlying mechanisms leading to this relationship, we find that incentivised CEOs are inclined to report more conservatively and transparently. This transformation in accounting and reporting practises

facilitates the timely dissemination of precise information, especially bad news, to market participants. Overall, consistent with the optimal contracting perspective, our research demonstrates that CSR contracting can improve the sustainability and stability of the financial market while motivating CEOs to safeguard the interests of the diverse stakeholders of firms.

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2SLS	Two-stage least squares
CAPEX	Capital Expenditure
CEO	Chief Executive Officer
CFO	Chief Financial Officer
COO	Chief Operating Officer
COVID-19	Coronavirus disease
CRSP	Center for Research in Security Prices
CSO	Chief Sustainability Officer
CSR	Corporate Social Responsibility
DEF 14A	Definitive proxy statement
DiD	Difference-in-Differences
EDGAR	Electronic Data Gathering, Analysis, and Retrieval
EPS	Earnings per Share
ESG	Environmental, social, and corporate governance
FE	Fixed effects
ISS	Institutional Shareholder Services
IV	Instrumental variable
NERCRD	Northeast Regional Center for Rural Development
NPV	Net Present Value
OLS	Ordinary Least Squares
PSM	Propensity Score Matching
R&D	Research and Development
SEC	US Securities and Exchange Commission
SIC	Standard Industrial Classification
TA	Total assets
US or USA	United States of America
UK	United Kingdom

Chapter 1. Introduction

1.1. Introduction

Pay for corporate social responsibility (CSR) performance, also known as CSR contracting, is one of the newest developments of executive compensation design as a corporate governance initiative that directs managerial focus on social and environmental issues. In contrast to the traditional remuneration schemes that focus on shareholder interests, this approach involves incorporating CSR performance criteria into executive contracts, such as reducing CO_2 emissions and improving workforce diversity. By doing so, firms aim to address CSR concerns and enhance the value created for various non-shareholding stakeholders.[1] Nevertheless, when the interests of managers are more closely aligned with those of stakeholders, little is known about the subsequent changes in the behaviour of incentivised executives, corporate policies, and firm outcomes. By constructing a novel dataset that delineates different aspects of CSR contracting provisions, this thesis aims to enhance our understanding of the effects of CSR contracting on various dimensions of managerial decision-making and the economic implications of this novel remuneration scheme.

In this chapter, our objectives are to present the motivation behind our research, outline the topics and empirical questions we seek to address, describe the construction of our novel CSR contracting dataset, and summarise our main findings. The introduction chapter is structured as follows. Section 1.2 delves into the ongoing debates surrounding the actual effects of CSR contracting on corporate outcomes, which motivates several research questions. Section 1.3 presents major and sub-research questions related to each empirical chapter. Section 1.4 details the data sources and data collection method applied in the construction of the dataset used throughout the thesis. Section 1.5 discusses the main empirical findings. Section 1.6 presents the structure of the thesis.

[1] We define non-shareholder stakeholders as those who affect and are affected by firms' decisions and outcomes, including creditors, employees, customers, suppliers, communities, the environment, government, and regulatory bodies. From this point to the end of this thesis, we use the term "stakeholders" to refer to all stakeholders listed above.

1.2. Research motivation

The emergence of multiple recent social and environmental challenges, such as the widespread COVID-19 pandemic and severe climate change, has amplified the global call for corporations to focus on sustainability through CSR activities. This development, however, brings forth a long-debated question: does CSR create value for stakeholders while enhancing shareholder value, or does it benefit stakeholders and CEOs at the expense of shareholders? (Borghesi et al., 2014; Kruger, 2015; Masulis and Reza, 2015; Lins et al., 2017). In this context, the integration of CSR performance criteria, which motivate the CSR efforts of CEOs, raises similar doubts regarding the actual effects of CSR contracting on managerial decision-making and firm outcomes.

On the one hand, the optimal contracting view suggests that CSR contracting serves as an efficient design that informs shareholders about the commitments of CEOs toward long-term, strategic sustainability targets. Specifically, some shareholders believe that superior CSR performance would facilitate the accumulation of stakeholder-engagement experience and production process innovations, thus resulting in the increased rent-earning potential of firms' resources and swift corporate responses to environmental and social changes (Bansal, 2005). Consistent with the resource-based explanations of CSR, these economic benefits generate internally inimitable resources that differentiate firms from competitors (Hart, 1995; Frynas and Yamahaki, 2016). Alternatively, socially responsible shareholders may prioritise CSR performance independently of financial performance. These shareholders are willing to forgo financial benefits to pursue sustainability targets (Hart and Zingales, 2022). Whether shareholders view CSR as an economic or moral objective in both cases, relying solely on short-term, retrospective financial metrics may not sufficiently inform shareholders about CEOs' competence in pursuing long-term sustainability targets. Nevertheless, CSR metrics would fulfil this monitoring role, ideally, by providing additional information about CEOs' efforts and long-term orientation toward stakeholders (Ittner et al., 1997; Flammer et al., 2019). In this perspective, consistent with the information hypothesis of Holmstrom (1979), CSR contracting provides valuable signals about CEO performance, thus enhancing the effectiveness of compensation contracts in incentivising CEOs to maximise shareholder value.

On the other hand, critics argue that CSR contracting is nothing more than a flawed compensation design that facilitates managerial rent extraction. In this perspective, corporate outsiders' oversight in CSR contracting settings is crucial to ensure this compensation design's successful implementation (Bebchuk and Fried, 2003). To improve the external scrutiny process, three preliminary conditions are required regarding the implementation of CSR contracting: the specificity of CSR goals, the transparent disclosure of actual performance and rewards, and the disclosure of contextual information. Nevertheless, a recent study by Bebchuk and Tallarita (2022) document that at least one condition is not fulfilled when large corporations link CEO compensation to CSR metrics, rendering external reviewability ineffective. In this vein, CEOs may employ ex-post superior CSR performance as a convenient means to conceal their excessive compensation derived from shareholder wealth.

To shed light on this ongoing debate, some empirical studies have examined whether CSR contracting is a value-creating, or value-destroying, compensation design. Nevertheless, the findings are mixed. A notable study by Flammer et al. (2019) shows that CSR contracting positively affects firms' value, CSR performance, and innovation. Similar to Flammer et al. (2019), Tsang et al. (2021) find that CSR-based compensation fosters innovative activities of firms. Supporting the optimistic view about CSR contracting, Hong et al. (2016) find that firms with stronger governance quality are more likely to become CSR contracting adopters. On the contrary, examining CSR contracting provisions adopted by international firms, Cohen et al. (2023) find that CSR contracting is not associated with improved financial performance. Similarly, Berrone and Gomez-Mejia (2009) posit that CSR-based compensation accounts for an insignificant portion of executive compensation, thereby revealing the symbolic purpose of this approach.

In addition to the mixed empirical findings on the effects of CSR contracting on firm performance, there are some important, yet unanswered, questions that could contribute to a more comprehensive understanding of CSR contracting. First and foremost, the impacts of CSR contracting on CEO decision-making, such as resource allocation, risk-taking, and information disclosure, remain unclear and require thorough investigation. Understanding these impacts is

relevant and intriguing since incentivised CEOs must engage with shareholders and stakeholders to address their interests and navigate potential conflicts between them. Second, there is limited knowledge regarding whether the subsequent stakeholder-oriented behaviour of CEOs, as a mechanism, paves the way for more sustainable market and firm performance while improving firms' relationships with stakeholders. Exploring and linking the variation in firm outcomes with changes in incentivised CEOs' behaviour would contribute to the comprehensive understanding of CSR contracting and address the ongoing debate, especially when this practise becomes increasingly prevalent in the corporate world (Flammer et al., 2019).

Motivated by these research gaps, in the first empirical study in Chapter 3, we examine the impact of CSR contracting provisions on share repurchase decisions. The rationale of this study is that if CEOs are incentivised to focus on stakeholder-oriented investments that enhance stakeholder value, they would preserve sufficient financial resources for these strategic CSR investments. Specifically, while repurchases serve as an efficient means to distribute excess cash to shareholders and signal undervaluation (e.g., Vermaelen, 1981; Jensen, 1986), aggressive repurchase decisions undermine firms' ability to initiate and maintain CSR expenditures, especially when firms experience cash shortfalls (e.g., Daniel et al., 2010; Bliss et al., 2015; Cohn and Wardlaw, 2016; Xu and Kim, 2022). Considering that share repurchases are not ongoing commitments of firms for future payouts and are contingent upon the availability of strategic investment projects (Jagannathan et al., 2000; Brav et al., 2005), incentivised CEOs should buy back shares more conservatively to safeguard stakeholder interests.

Nevertheless, finding empirical evidence supporting this view faces several challenges. First, if CSR contracting reduces repurchases, there would be an alternative explanation consistent with the rent-extraction view. Accordingly, the lack of disclosed context, measurability, and specificity of CSR contracting weakens the outsiders' reviewability (Bebchuk and Tallarita, 2022). In this vein, incentivised CEOs may overinvest in CSR-related projects to buy public support and disguise weak financial performance. This action may be supported by the proceeds from share repurchase reduction, which allow CEOs to engage in value-destroying investments. This view is also consistent with the view of Jensen (1986) and Grullon and Michaely (2004) that an essential

motive of share repurchases is to distribute free cash flow to shareholders to curb overinvestment by management. Second, it is possible that the relationship between CSR contracting and share repurchases is positive. Specifically, CSR investments are long-term in nature, while the corresponding future payoffs are uncertain (Hart, 1995; Berrone and Gomez-Mejia, 2009). As a result, risk-averse CEOs may consider CSR contracting as a risky type of compensation. Subsequently, they may want to compensate for the increased compensation risk by repurchasing shares more aggressively. By doing so, they can temporarily boost short-term stock prices to monetise their illiquid holdings of firm stocks and earn bonuses resulting from increased reported earnings per share (e.g., Kahle, 2002; Cheng et al., 2015; Edmans et al., 2022). Nevertheless, our empirical findings in Chapter 3 demonstrate that incentivised CEOs engage in share repurchases more cautiously, aiming to preserve financial resources for CSR investments. These findings do not support the rent-extraction explanation.

The findings in Chapter 3, however, are not sufficiently strong to reject the possibility that CSR contracting is a flawed compensation design for two reasons. First, we cannot completely rule out the possibility that CEOs may opportunistically reduce repurchases and use the proceeds to overinvest in value-destroying projects. Second, the benefits relating to share repurchase reduction can only be observed for firms that buy back shares regularly in the past, while it remains unclear how CSR contracting adopters without repurchase programs allocate resources to safeguard stakeholder interests.

Despite these concerns, the results of Chapter 3 suggest another direction to examine the effects of CSR contracting more comprehensively, specifically concerning the conservativeness of CEOs' decisions encompassing not only repurchases, but also other corporate policies. Therefore, in Chapter 4 of this thesis, we examine the impact of CSR contracting on managerial risk-taking. We base our analyses on the argument that incentivised CEOs would attempt to achieve a balance between the divergent risk preferences of shareholders and non-shareholder stakeholders (Jensen and Meckling, 1976). Accordingly, as liquid and residual claimants of firms, shareholders tend to take more risk to capture potential gains while accepting limited losses in adverse scenarios (Gao et al., 2021). In contrast, stakeholders have illiquid affiliations with firms and bear much of the

adverse effects of short-term downside risks, especially when firms struggle with financial constraints (e.g., Cohn and Wardlaw, 2016; Xu and Kim, 2022). In this vein, CEOs with CSR contracting should genuinely consider the lower risk preferences of stakeholders, resulting in a more prudent approach to risk-taking. Another hypothesis is that if CEOs reduce corporate risk-taking, they should reflect this behaviour in the adoption of more conservative corporate policies, including financial and investment policies (Coles et al., 2006; Chen et al., 2022). Last, CSR contracting is not a desired compensation design if its risk-reduction effect is sub-optimal and hurts firm performance. However, we hypothesise that CSR contracting would induce more effective risk-taking, allowing firms to address stakeholders' concerns while maintaining strong financial performance, as reported by Flammer et al. (2019).

Similar to Chapter 3, the conclusions drawn in Chapter 4 are susceptible to alternative explanations. First, if firm governance is weak and inadequate to realise the benefits of CSR contracting, CEOs may exploit superior CSR performance as a shelter against internal and external monitoring. For example, CEOs can focus on CSR targets to gain social reputation and protection from stakeholders while enjoying a "quiet life" by forgoing risky, yet profitable, investments (Bertrand and Mullainathan, 2003). Second, the long-term and uncertain nature of CSR-based compensation may aggravate the compensation risk for CEOs, reducing managerial risk-taking (Berrone and Gomez-Mejia, 2009; Derchi et al., 2020; Cai et al., 2020). However, our empirical results partially refute these potential alternative explanations regarding the risk-reduction benefits of CSR contracting. Instead, we provide evidence that incentivised CEOs effectively align firm risk with the risk preferences of stakeholders without causing harm to shareholder returns.

In the third empirical chapter (Chapter 5), we explore another aspect of managerial behaviour that is likely affected by CSR-based compensation: bad news withholding. Specifically, CEOs may be myopic because they have career concerns that vary with short-term performance (Gibbons and Murphy, 1992), compensation plans that are associated with short-term stock prices (Stein, 1989), and market pressure to meet earnings benchmarks (Skinner and Sloan, 2002; Graham et al., 2005). Myopic CEOs, in order to inflate reported earnings, may prioritise short-term profitability over

long-term sustainability by sacrificing stakeholder-oriented expenditures, knowing that the immediate economic benefits of CSR are minimal and uncertain (Hart, 1995; Berrone and Gomez-Mejia, 2009). Considerable discretion that CEOs have on manipulating stakeholder-related spending, such as employee safety training, supports them in managing earnings upward and masking actual (unfavourable) performance, thereby accumulating bad news.

In this context, we hypothesise that incentivised CEOs would have less flexibility in manipulating CSR expenditures to withhold bad news, since they are formally held responsible for CSR outcomes. This effect would potentially lead to the reduced likelihood of a stock price crash, as discussed in Jin and Myers (2006) and Hutton et al. (2009). Furthermore, this conjecture is closely related to the findings in Chapter 4. Accordingly, empirical studies have shown that one important motive for CEOs to manage and smooth income is to reduce reported earnings volatility, thus reducing investors' perception of firm risk and the resultant risk premium charged on firms (Trueman and Titman, 1988; Khurana et al., 2018). Firms with higher ex-ante risk-taking, for example, higher leverage, are also more likely to withhold bad news to improve investors' perception of firms' riskiness and support share prices, resulting in higher stock price crash risk (Kim et al., 2011a). In this vein, the lower corporate risk-taking due to CSR contracting, as explored in Chapter 4, suggests that managerial incentives to accumulate adverse information should decline, thereby reducing stock price crash risk. Consistent with our conjecture, the findings of Chapter 5 suggest that CSR contracting is negatively associated with stock price crash risk.

1.3. Research questions

Motivated by the ongoing debates and the lack of thorough understanding of CSR contracting, we propose important research questions that are addressed in each empirical chapter (Chapters 3 to 5), as follows.

For the first empirical study (Chapter 3):

> *Does CSR contracting motivate CEOs to reduce share repurchases and preserve financial resources for stakeholder-oriented initiatives?*

a. Is the impact of CSR contracting on repurchase decisions equal in all circumstances?

b. Can the rent-extraction perspective on CSR contracting offer an alternative explanation for the influence of CSR contracting on share repurchases?

c. Do incentivised CEOs reduce dividends for the same reason as share repurchases?

d. Do incentivised CEOs decrease share repurchases and subsequently utilise the proceeds to pay higher dividends to shareholders?

For the second empirical study (Chapter 4):

Does CSR contracting motivate CEOs to reduce corporate risk-taking and balance the risk preferences of shareholders and non-shareholding stakeholders?

a. Is the impact of CSR contracting on firm risk equal in all circumstances?

b. Can the rent-extraction perspective on CSR contracting offer an alternative explanation for the moderating effect of CSR contracting on firm risk?

c. Does CEO risk-aversion offer an alternative explanation for the moderating effect of CSR contracting on firm risk?

d. Do incentivised CEOs adopt more conservative corporate policies, such as investment and financial policies, if they tend to behave more prudently?

e. Does CSR contracting lead to sub-optimal risk-taking decisions by CEOs, causing reduced risk but negatively impacting future firm performance?

For the third empirical study (Chapter 5)

Does CSR contracting alleviate managerial bad news hoarding by reducing CEOs' incentives to manipulate stakeholder-related expenditures and boost reported earnings, ultimately resulting in lower stock price crash risk?

a. Is the impact of CSR contracting on crash risk equal in all circumstances?

b. Through which channels do incentivised CEOs reduce bad news accumulation (i.e., accelerate bad news to investors and analysts) and the subsequent likelihood of stock price crashes?

In Section 1.5, we will delve into the empirical results pertaining to the research questions raised above.

1.4. Data sources and data collection methodology

1.4.1. Data sources and data collection methodology

To uncover the facts surrounding CSR contracting and examine its impact on managerial behaviour and firm outcomes, we meticulously hand-collect information and construct a comprehensive dataset encompassing various aspects of CSR contracting in CEO compensation. The primary source of information is derived from proxy statements (Form DEF 14A) that firms file annually with the US Securities and Exchange Commission (SEC). Proxy statements contain key information about corporate governance, shareholder proposals, the composition of the board of directors, new director appointments, and comprehensive information on executive compensation. Although firms usually publish proxy statements on their websites, we centralise our data collection by accessing these statements from SEC's Electronic Data Gathering, Analysis, and Retrieval (EDGAR) to ensure data quality consistency.[2]

However, the manual construction of the CSR contracting dataset from proxy statements faces several challenges. First, although the structures of proxy statements are generally similar between firms to comply with the reporting rules of SEC, firms have a certain degree of flexibility in disclosing CSR-based compensation. For instance, some firms specify the CSR criteria, minimum and maximum thresholds for CSR performance that lead to financial rewards, forms of compensation (such as cash, stocks, or shares), and the weighting of CSR-based compensation relative to total CEO compensation. In contrast, other firms generally discuss these aspects without providing details. This difference causes delays in the data collection process, makes comparing CSR contracting provisions between firms challenging, and causes a certain degree of bias in later statistical analyses. Second, the structure of proxy statements has changed over time following the introduction of the new SEC's reporting requirements. The most notable change is

[2] Proxy statements can be searched and accessed at https://www.sec.gov/edgar/search/

the introduction of the 2006 disclosure rules, which require firms to discuss and analyse the compensation policy, objectives, and actual pay of top executives in a new section called "Compensation Discussion and Analysis". As a result, a certain gap arises between CSR pay information, such as the increased utilisation of weighting schemes and a more explicit categorisation of CSR provisions before and after the fiscal year of 2006. This issue, therefore, somewhat affects the consistency of the collected information. However, we assess that firms generally adopt stable and consistent CSR contracting policies over time, without sudden changes, and the number of firms affected by regulatory amendments is small compared to the whole sample. Overall, our hand-collected dataset provides a reliable source of information to study the economic implications of CSR contracting.

Following prior literature (e.g., Flammer et al., 2019; Qin and Yang, 2022), we focus on CSR contracting practises within companies that comprise the Standard and Poor's 500 (S&P 500) index. Specifically, the firms included in our sample are distinguished by their large size and public visibility, setting them apart from smaller firms that are not covered in our study. It is reasonable to believe that their compensation strategies (including CSR contracting) would have substantial implications for those smaller firms. As a result, the findings derived from our data sample can provide reliable indications about the impact of CSR contracting on managerial behaviour and firm outcomes, which may also be relevant to other smaller firms. In addition, we begin the sample period in 2000 to avoid the impacts of data issues associated with pre-2000 proxy statements in SEC's EDGAR.[3] We end our sample period in 2018 because the occurrence and spread of the COVID-19 pandemic (from 2019 to 2023) may confound the potential effects of CSR contracting on firm outcomes.[4]

In the next step, we compile a list of performance criteria categorized as CSR criteria and specify whether a firm qualifies as a CSR contracting adopter. Following Flammer et al. (2019), we define

[3] We find a large number of missing values (exceeding 10%) for CSR contracting variables before 2000, which is attributed to the challenges of accessing and collecting pre-2000 proxy statement data from SEC's EDGAR platform.

[4] Firms were under pressure to comply with strict health and safety regulations (such as those of OSHA and CDC) in the post-2018 period. Subsequently, some firms temporarily link executive compensation to health and safety criteria just to meet the compliance target and confine the adverse impacts of the pandemic on their business.

a performance criterion as a CSR criterion if it relates to one of the following 18 categories of five groups of stakeholders: (i) Community group that contains the criterion "Community"; (ii) Customer group that contains the criteria "Customer satisfaction", "Health", and "Product safety"; (iii) Employee group that contains the criteria "Employee well-being", "Diversity", "Reduce injury rates", and "Safety"; (iv) Environment group that contains the criteria "Energy efficiency", "Environment performance", "Environmental compliance", "Environmental goals", "Environmental projects", and "Greenhouse gas emissions reductions"; (v) Non-specified stakeholder group that contains the criteria "Compliance with ethical standards", "CSR", "Performance relative to a corporate responsibility index", and "Sustainability" (Flammer et al., 2019, p.1105). Accordingly, a firm is considered a CSR contracting adopter if it integrates at least one of these CSR criteria into CEO compensation in a fiscal year. Overall, we obtain a data sample of 9208 observations, of which 2518 observations (27.35%) are associated with CSR contracting criteria. This data sample, then, is used throughout this thesis for all empirical chapters.[5]

Based on this list of CSR metrics, we construct two main measures of CSR contracting that are utilised in all empirical chapters. First, we determine whether a firm has CSR-based compensation by creating an indicator variable that equals one if the firm links CEO compensation to at least one of the aforementioned CSR metrics, and zero otherwise. Second, we calculate the percentage of actual CSR-based compensation relative to the total CEO compensation (i.e., the substantiveness of CSR contracting). The weight of CSR contracting provisions is zero for firms that do not adopt CSR contracting. We mark corresponding observations as missing for firms that adopt CSR contracting but do not specify the amount of CSR-based compensation.

To develop a comprehensive understanding of CSR contracting, we also collect additional information about this remuneration scheme. However, this information is not utilised in our empirical analyses. First, we record the forms of CSR-based compensation, which may be in the form of cash, stock, or option compensation. Second, we also pay attention to whether CSR-based

[5] The sample sizes utilised in each chapter may vary as we combine the initial CSR contracting dataset with other data sources, such as stock price and financial data of firms, which can lead to missing observations.

compensation is included in short-term incentive plans, long-term incentive plans, or both short-term and long-term incentive plans.

Compared to prior literature, our CSR contracting dataset is novel and more comprehensive in several ways. First, our sample is more extensive and covers a broader period of time, spanning from 2000 to 2018. This extensive coverage distinguishes our study from other prominent research on CSR contracting, as many of these studies focus on much shorter observation periods.[6] The larger sample enables us to derive more accurate results and increases the generalisability of our conclusions. Second, unlike Flammer et al. (2019) and Cohen et al. (2023), this thesis focuses explicitly on CSR-based compensation for CEOs, rather than considering the presence of CSR contracting for any top executives. Indeed, there are cases in which only non-CEO executives (e.g., CFOs, CTOs, and COOs) receive CSR-based compensation, while the same provisions are not applied to CEOs. In these cases, changes in firm outcomes due to CSR contracting provisions may not be apparent since CEOs, rather than other executives, have the most substantial influence on firm policies. Thus, focusing on CEO compensation helps us to directly examine the effects of CSR contracting on managerial decisions and firm outcomes and avoid making biased conclusions.

Third, we construct two CSR contracting measures used throughout this thesis. The first measure is an indicator variable that indicates whether a firm is a CSR contracting adopter. The second measure is the substantiveness of CSR contracting, that measures the share of CSR-based compensation relative to total CEO compensation. The construction of these variables improves our findings in several ways. Specifically, having an additional measure of CSR contracting would improve the robustness of our results, compared to a single-measure research setting. Further, unlike the indicator variable, the substantiveness of CSR contracting provides a better source of variation in the variable itself. One possible bias is that firms may adopt CSR contracting, but the corresponding rewards for CSR performance are only marginal, compared to other compensation components. In this case, CSR contracting may not have real impacts on managerial decisions

[6] For example, Flammer et al. (2019) focused on the period from 2004 to 2013, Cohen et al. (2023) focused on the period from 2011 to 2020, and Qin and Yang (2022) focused on the period from 2004 to 2018.

and firm outcomes, although the true relationships are statistically significant. With two measures of CSR contracting in hands, we can carefully study the economic implications of CSR pay, thus alleviating possible biases in our conclusions.

1.4.2. Exploration of the CSR contracting dataset

To offer an in-depth overview of CSR contracting practises within our sample of S&P 500 firms, Table 1.1 presents summary statistics on the trend of CSR contracting across industries and over time in our sample, which consists of 9,208 firm-year observations. This table reports the number and the percentage of firm-year observations with CSR criteria explicitly specified in CEO contracts. Further, we also present the average percentage of CSR-based compensation to total CEO compensation.

In Panel A of Table 1.1, we report the trend of CSR-based compensation over time. Overall, CSR contracting is becoming more prevalent, since the percentage of S&P 500 companies that adopt this approach significantly increases from 7.4% in 2000 to 40.9% in 2018. We visualise the evolution of CSR contracting and corresponding statistics in Figure 1.1. In addition, we report that the annual average of the percentage of CSR-based compensation to total CEO compensation is 3.2%, which is similar to the statistic of 4.2% reported by Flammer et al. (2019), and the standard deviation is 2.8%.

Panel B of Table 1.1 reports and compares CSR contracting adoption rates among 12 Fama-French industries from 2000 to 2018. On average, 27.35% of firms in our sample incorporate sustainability targets into CEO compensation during the observation window, while the actual adoption rates vary significantly across industries. This statistic aligns with Flammer et al. (2019), who report that 23.8% of S&P 500 firms adopt this provision from 2004 to 2013. Because firms are receiving higher public pressure to behave socially responsibly, more firms have been using CSR contracting recently, explaining why our statistic (27.35%) is slightly higher than the statistic (23.8%) reported by Flammer et al. (2019). Taking a closer look, the adoption rates of CSR contracting are highest among industries that are associated with social, environmental, and safety issues, such as “Utilities” (66.7%) and “Oil, gas, and coal extraction and products” (65.7%). In

contrast, industries such as “Business equipment”, “Finance”, and “Wholesale, retail, and some services” have the lowest percentage of firm-year observations with CSR contracting, since they are not emission-intensive sectors. Furthermore, regarding the substantiveness of CSR contracting across 12 Fama-French industries, “Finance” (4.98%), “Utilities” (3.92%), and “Mines, construction, and transportation” (3.45%) are industries that provide the highest percentage of CSR-based compensation to total CEO compensation.

Figure 1.1. The adoption of CSR contracting over time

This figure illustrates the evolution of CSR contracting between firms over time. The sample comprises firms in the S&P 500 index from 2000 to 2018, for which proxy statements and relevant data are obtained from the SEC's EDGAR database. The left axis represents the number of firms adopting CSR contracting, while the right axis represents the percentage of firms adopting CSR contracting.

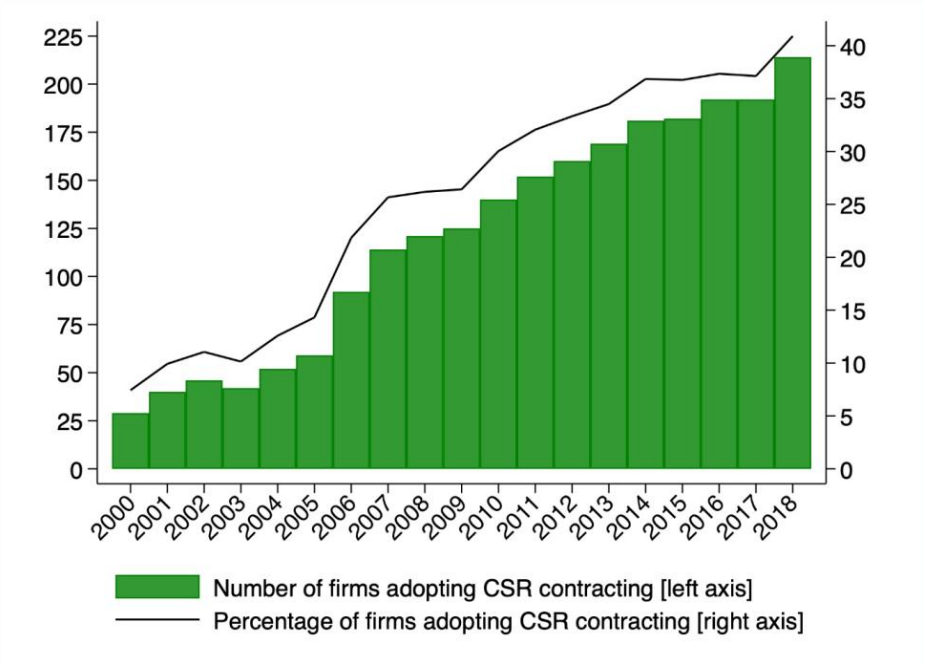

Table 1.1. CSR contracting across industries and over time

This table presents the adoption of CSR contracting provisions in executive compensation packages across industries and over time. Our sample consists of all S&P 500 companies from 2000 to 2018. Panel A reports the number and percentage of firm-year observations with CSR contracting over time (from 2000 to 2018). Panel B reports the number and percentage of firm-year observations with CSR contracting across 12 Fama-French industries.

Panel A. CSR contracting over time

Year	No. of observations	No. firm-years with CSR contracting	%firm-years with CSR contracting
2000	390	29	0.074
2001	403	40	0.099
2002	416	46	0.111
2003	414	42	0.101
2004	413	52	0.126
2005	412	59	0.143
2006	421	92	0.219
2007	444	114	0.257
2008	462	121	0.262
2009	473	125	0.264
2010	466	140	0.3
2011	474	152	0.321
2012	480	160	0.333
2013	490	169	0.345
2014	491	181	0.369
2015	495	182	0.368
2016	514	192	0.374
2017	517	192	0.371
2018	523	214	0.409
2019	510	216	0.424
All	9208	2518	27.35%

Panel B. CSR contracting across industries

Industry	Number of observations	No. firm-year observations with CSR contracting	% firm-year observations with CSR contracting
Utilities	622	415	66.70%
Business equipment	1231	220	17.90%

(continues)

(continued)

Industry	Number of observations	No. firm-year observations with CSR contracting	% firm-year observations with CSR contracting
Chemicals and allied products	299	121	40.50%
Consumer durables	49	6	12.20%
Oil, gas, and coal extraction and products	543	357	65.70%
Healthcare, medical equipment, and drugs	687	149	21.70%
Manufacturing	868	207	23.80%
Finance	1710	307	18.00%
Consumer nondurables	559	160	28.60%
Mines, construction, and transportation	1504	345	22.90%
Wholesale and retail	864	119	13.80%
Telephone and television	272	112	41.20%
All	9208	2518	27.35%

Besides, Panel A of Table 1.2 presents the frequency of CSR criteria that CSR contracting adopters use. These firms place particular emphasis on the benefits of employees, as evidenced by the three most commonly used criteria: "Employee well-being" (46.62% of the total sample), "Safety" (44.12%), and "Diversity" (35.98%). The other most populated criteria, which follow employee-oriented criteria, include "Environmental performance" (16.28%) and "Compliance with ethical standards" (12.51%). Other criteria only appear with a frequency below 10%.

Given that each firm may use multiple CSR criteria in a fiscal year, in Panel B of Table 1.2, we aggregate the data by targeted stakeholder groups and document that out of 2518 firm-year observations with CSR contracting, 2348 (93.25%) of them have criteria that focus on employees. In addition, 596 firm-year observations (23.67%) have environment-oriented criteria, while 474 firm-year observations (18.82%) include criteria that do not target a specific stakeholder. In

contrast, only 246 (9.77%) and 174 (6.91%) firm-year observations have criteria relating to the benefits of customers and community, respectively. Once again, we document a significant bias in selected firms' focus on the interests of employees, compared to other groups of stakeholders.

Table 1.2. CSR criteria and targeted stakeholder groups

This table showcases the relative popularity of CSR criteria alongside their corresponding targeted stakeholder groups. Panel A aggregates and presents the total number of observations for each of the 18 CSR criteria discussed in Section 1.4. These criteria depend on five groups of targeted stakeholders that are specified in Flammer et al. (2019), including "Community", "Customer", "Employee", "Environment", and "Other". Panel B aggregates and reports the total number of observations by these groups of stakeholders.

Panel A. The popularity of CSR criteria used in CSR contracting

CSR criteria	Stakeholder groups of CSR criteria	No. of observations with the criteria	% of observations with the criteria (of 2518 firm-year observations with CSR contracting)
Community	Community	174	6.9%
Customer satisfaction	Customer	7	0.3%
Health	Customer	198	7.86%
Product safety	Customer	43	1.71%
Diversity	Employee	906	35.98%
Employee well-being	Employee	1174	46.62%
Reduce injury rates	Employee	53	2.10%
Safety	Employee	1111	44.12%
Energy efficiency	Environment	37	1.47%
Environmental compliance	Environment	80	3.18%
Environmental goals	Environment	52	2.07%
Environmental performance	Environment	410	16.28%
Environmental projects	Environment	16	0.64%
Greenhouse gas emissions reductions	Environment	63	2.50%
Compliance with ethical standards	Other	315	12.51%
CSR	Other	140	5.56%
Performance relative to a corporate responsibility index	Other	4	0. 16%
Sustainability	Other	32	1.27%

Panel B. The popularity of stakeholder groups targeted by CSR contracting

Stakeholder groups related to CSR metrics	No. of observations with CSR metrics relating to a stakeholder group	% of observations with CSR metrics relating to a stakeholder group (of 2518 firm-year observations with CSR contracting)
Community	174	6.91%
Customer	246	9.77%
Employee	2348	93.25%
Environment	596	23.67%
Other	474	18.82%

In Table 1.3, we provide a detailed summary of other aspects of CSR contracting. Specifically, Panel A of Table 1.3 presents the share of compensation types of CSR contracting. Among adopters of CSR contracting, the majority (86.74%) provide cash compensation for CSR outcomes, followed by a combination of cash and share compensation (11.2%). Firms rarely use the cash-option and cash-share-option combinations, as they are associated with only 0.12% and 0.91% of the total number of observations, respectively. Panel B of Table 1.3 presents whether firms prefer including CSR contracting provisions in short-term or long-term executive incentive plans. It is clear that most firms integrate CSR criteria in short-term incentive plans (89.12%), followed by long-term incentive plans (1.43%) and both plans (9.45%). Panel C of Table 1.3 reports the number of CSR criteria used in annual CEO compensation. We document that most firms adopt one (41.46%) and two (31.81%) CSR criteria in a fiscal year. Only 26.73% of firms utilise three or more criteria each year.

Table 1.3. Other characteristics of CSR contracting

This table presents the relative popularity of the compensation forms, the term structure, and the number of CSR metrics adopted in annual CSR contracting provisions. Accordingly, Panel A aggregates and presents the total number and percentage of observations for each form of compensation, including the following combinations: (i) Cash only, (ii) Shares only, (iii) Cash and options, (iv) Cash and shares; (v) Cash, shares, and options. Panel B aggregates and presents the total number and percentage of observations for different terms of incentive plans, including short-term incentive plans, long-term incentive plans, and both short-term and long-term incentive plans. Panel C presents the number of CSR metrics that CSR contracting adopters integrate into CEO compensation and their popularity.

Panel A. The popularity of the forms of CSR-based compensation

Compensation forms	Number of observations	% of observation
Cash only	2184	86.74%
Cash and options	3	0.12%
Cash and shares	282	11.20%
Cash, shares, and options	23	0.91%
Shares only	26	1.03%
Total	2518	100.00%

Panel B. The popularity of the terms of CSR-based compensation

Term of compensation	Number of observations	% of observation
Short-term incentive plans	2244	89.12%
Long-term incentive plans	36	1.43%
Both short-term and long-term incentive plans	238	9.45%
Total	2518	100.00%

Panel C. The number of CSR metrics in annual CSR contracting provisions

Number of CSR metrics	Number of observations	% of observation
1	1044	41.46%
2	801	31.81%
3	423	16.80%
4	225	8.94%
Greater than 4	25	0.99%
Total	2518	100.00%

1.5. Main findings

This section discusses and summarises the findings of three empirical chapters in this thesis, including Chapters 3 to 5. The main goals of these chapters are threefold. First, we aim to identify

changes in firm outcomes due to CSR contracting provisions in CEO contracts. Second, we examine whether the impacts of CSR contracting on firm outcomes are equal between firms and in all circumstances. Third, we aim to identify the channels through which CSR contracting affects firm outcomes, thus suggesting changes in corporate decisions adopted by incentivised CEOs. The main findings of each empirical chapter are summarised as follows.

In Chapter 3, we hypothesise that CEOs having CSR contracting have stronger incentives to initiate and maintain stakeholder-oriented investments to meet CSR goals. Consequently, this creates a greater demand for preserving financial resources, ultimately leading to more conservative repurchase decisions. In line with this conjecture, we find that CSR contracting adopters are less likely to initiate repurchase programs, and if they do, they tend to repurchase less. These baseline findings are robust to a series of robustness checks as follows. First, we rule out the possibility that the effect of CSR contracting on repurchases is sensitive to the choices of share repurchase measures. Following Stephens and Weisbach (1998) and Jagannathan et al. (2000), we construct different measures of share repurchases utilising different databases (i.e., Compustat, CRSP) and show that the results remain the same. Second, one may argue that the choice of observation window may affect the results because there is evidence that firms reduce repurchasing shares to retain financial resources and deal with financing shocks (Bliss et al., 2015). We exclude observations from 2007 to 2009 related to the 2008 global financial crisis and show that CSR contracting still significantly reduces repurchases. Third, we implement the falsification test by randomly assigning the values of CSR contracting across the sample and constructing pseudo measures of CSR contracting. We provide evidence of an insignificant relationship between pseudo CSR contracting and repurchases, thereby alleviating the concern that our baseline results are influenced by unobserved factors coinciding with the use of CSR contracting.

Next, we explore whether the adverse effect of CSR-based compensation on share repurchases differs in the cross-section. Our analyses reveal that the effect of CSR contracting is more pronounced for firms with more investment opportunities and high cash flow volatility. These findings are consistent with two implications of the view that CEOs with CSR contracting pay

more attention to stakeholders' interests. First, maintaining sufficient funds to safeguard CSR investments becomes more crucial when a firm's cash flow is highly volatile, heightening the risk of financial constraints and inducing CEOs to repurchase more conservatively. Second, when presented with more investment options, incentivised CEOs should be more inclined to preserve funds for these investments before distributing residual cash through repurchase programs.

Nevertheless, the negative relationship between CSR contracting and repurchases may be opened to alternative explanations. Specifically, it is possible that historical repurchase decisions may influence firms' propensity to link CEOs' compensation to CSR criteria (i.e., reverse causality). Besides, CEOs may also utilise weak governance quality, opportunistically reduce repurchases, and overinvest in CSR projects to capture juicy CSR-based rewards at the expense of shareholders. Nevertheless, our empirical analyses do not lend support to these alternative explanations.

Another concern regarding our baseline analysis is the possibility that some omitted firm-specific or industry-specific factors may affect the adoption of CSR contracting and the reduction of share repurchases simultaneously. To address these concerns and establish a reliable causal relationship, we implement the difference-in-differences analysis using the first-time adoption of CSR contracting as a treatment event. We, then, match treated firms (i.e., firms with CSR contracting) with control firms (i.e., firms without CSR contracting) to ensure that matched firms are indistinguishable from each other. Using a sub-sample of matched firms, we estimate the average treatment effect of CSR contracting on repurchases and provide evidence that the first-time adoption of CSR contracting has a negative and considerable impact on repurchases, compared to the pre-treatment period.

In our last analysis, we examine whether incentivised CEOs embrace changes related to an alternative and important payout method, specifically dividends. The impact of CSR contracting on dividends is ambiguous. On the one hand, incentivised CEOs may reduce dividends to preserve financial resources for stakeholder engagement, which is similar to the purpose of repurchase reduction. On the other hand, it is possible that CEOs initially reduce repurchases and distribute the proceeds to shareholders through increased dividends. Nevertheless, we find that CSR

contracting is neither negatively nor positively associated with future dividends. This finding supports the notion that dividend policy is sticky, and CEOs avoid cutting dividends to remain firms attractive to investors, even if they must pass up some profitable investment projects (Brav et al., 2005; Daniel et al., 2010).

Moving on to Chapter 4 of this thesis, we examine the impact of CSR contracting on managerial risk-taking. We find that the presence and the substantiveness of CSR contracting provisions are negatively associated with firm risk (measured by annualised standard deviation of stock returns). The results remain significant when we implement a series of robustness checks, including using alternative measures of firm risk (e.g., implied volatility, ROA volatility), an alternative observation window that excludes the period related to the 2008 global financial crisis, a falsification test, and additional control variables that explain managerial risk-taking (e.g., CEO vega and delta). In further analyses, we explore the cross-sectional heterogeneity in the moderating effect of CSR contracting on firm risk. Our findings suggest that the risk-reduction effect of CSR contracting is more pronounced when the risk to stakeholders' interests is elevated and when CEOs demonstrate a genuine commitment to addressing stakeholder concerns. Specifically, we document that the effect of CSR contracting is more substantial for firms that are highly financially constrained and operate in US counties with higher social capital levels.

Similar to Chapter 3, the risk-reduction effect of CSR contracting in Chapter 4 is subject to several alternative explanations. First, consistent with the rent-extraction view of CSR contracting (Bebchuk and Tallarita, 2022), this compensation design may undermine shareholder oversight by providing CEOs with greater discretion under the guise of safeguarding stakeholder interests. As a result, CEOs may avoid undertaking risky investments to enjoy a "quite life" (Bertrand and Mullainathan, 2003). Alternatively, CEOs may perceive increased compensation risk with the introduction of CSR contracting, as there is limited evidence supporting immediate financial benefits from CSR initiatives for firms (e.g., Hart, 1995; Berrone and Gomez-Mejia, 2009). Therefore, if CEOs are risk-averse, they may deliberately reduce risk-taking to compensate for the increased compensation risk. Last, it is possible that the relationship may reverse, meaning that historical firm risk may explain the adoption of CSR contracting. Nevertheless, we do not

find evidence supporting these alternative explanations, thus lending additional support to the optimal contracting view.

Although we control for different time-varying firm characteristics, firm- and year-fixed effects in the baseline analysis, we cannot completely rule out the possibility that there are unspecified omitted factors that drive our main results, as they could influence both the likelihood of the adoption of CSR contracting and firm risk. To alleviate the endogeneity concerns, we first employ the propensity score matching analysis. This approach allows us to control for the possible effects of firm-level characteristics and pin down the effect of CSR-based compensation on firm risk. We find that treated firms have significantly lower levels of firm risk than control firms, suggesting that this effect is highly likely due to the presence of CSR metrics in CEO contracts. Second, we implement the difference-in-differences approach. We use the first-time adoption of CSR contracting as a treatment event. This analysis aims to observe and compare the variation of firm risk for the periods before and after the treatment event. Accordingly, upon adoption, first-time adopters experience a notable reduction in firm risk, compared to non-adopters. Last, we employ the instrumental variable approach to further address endogeneity concerns. Following Flammer et al. (2019), we use the presence of constituency statutes in US states as an instrument. Constituency statutes are statutes that enable managers and directors to explicitly consider the interests of various stakeholders in making corporate decisions without being considered as breaching their fiduciary duties to shareholders. The presence of constituency statutes in US states where firms are incorporated suggests a positive relationship between this instrument and the likelihood that firms would adopt CSR contracting. Using this instrument, we isolate the exogenous component of CSR contracting and find that this component is negatively associated with firm risk.

In subsequent analyses, we explore the underlying mechanism leading to the risk-reduction effect of CSR contracting and its influence on firm performance. Regarding the mechanisms, we find that CEOs significantly reduce leverage and R&D expenditures after being incentivised by CSR contracting. In further analysis, we address the question of whether CSR contracting induces sub-optimal risk-taking that benefits stakeholders at the expense of shareholders. Our regression

results indicate that CSR contracting significantly improves firms' operating and stock performance, especially when market volatility is high. This evidence supports the notion that CSR contracting is an efficient compensation design that motivates calculated and more effective managerial risk-taking.

In the third empirical chapter (Chapter 5), we explore another aspect of managerial behaviour that is likely affected by CSR-based compensation: bad news withholding. Our main argument is that when CSR initiatives are considered strategic investments, firms adopting CSR contracting can effectively restrict CEOs' ability to manipulate stakeholder-oriented expenditures to boost reported earnings and conceal adverse information. To test this conjecture, we formally examine the relationship between CSR contracting and stock price crash risk, which results from bad news hoarding (Jin and Myers, 2006; Hutton et al., 2009). The empirical results indicate that CSR contracting statistically reduces crash risk. This finding remains unchanged when we employ alternative measures of crash risk, control for CEOs' option and stock incentives that influence managerial bad news hoarding, and conduct a falsification test. In addition, examining cross-sectional heterogeneity in the impact of CSR contracting on crash risk, we show that this effect is stronger for firms that have greater reliance on stakeholder relationships, higher earnings volatility, and operate in areas with higher levels of religiosity. These findings are consistent with the notion that CSR contracting is more valuable when protecting stakeholder claims is imperative and authentic.

Similar to Chapter 4, we employ several approaches to address endogeneity concerns about our baseline findings in Chapter 5. First, we employ the propensity score matching approach in which we match treated firms with control firms that have similar observable characteristics, making them indistinguishable. We find that a group of treated firms have significantly lower crash risk than a group of control firms. Second, we implement the difference-in-differences approach using the first-time adoption of CSR contracting as the treatment event. Our regression results show that the average treatment effect of CSR contracting on crash risk is negative and significant, suggesting that CSR contracting initiation represents a critical event that strongly influences crash risk, compared to other periods. Third, we employ the instrumental variable approach, using the

presence of US states' constituency statutes as the instrument. Consistent with previous analyses, we find that the isolated exogenous component of CSR contracting, due to the instrument, is negatively associated with future crash risk. Last, we address the reverse causality concern by showing that the historical presence and substantiveness of CSR contracting provisions do not affect the future likelihood of stock price crashes.

To complete our narrative on the effects of CSR contracting on managerial bad news hoarding, we investigate the channels through which CEOs communicate adverse information to market participants in a timelier manner. Accordingly, we find that incentivised CEOs are inclined to report more conservatively, in which they tend to accelerate the recognition of bad news as losses and delay the recognition of good news as gains. In addition, we document that incentivised CEOs produce more transparent financial reports, thereby enhancing the accuracy of analysts' earnings forecasts. To this end, our empirical findings reveal significant changes in managerial reporting policy induced by CSR contracting. These changes accelerate the communication of bad news to investors, promoting investor confidence and fostering market stability.

Collectively, in this thesis, we thoroughly examine and identify notable changes in CEO behaviour when incentivised to consider stakeholders' interests in their agenda. These changes include the adoption of more conservative share repurchase decisions, a more prudent approach to risk-taking, and a conservative and transparent reporting policy that alleviates bad news hoarding. However, the stakeholder-oriented behaviour of incentivised CEOs does not harm the interests of shareholders, as they contribute to the sustainable future performance of firms characterised by lower firm risk, lower stock price crash risk, and higher operating and stock performance. Contrary to the rent-extraction view of CSR contracting (Bebchuk and Tallarita, 2022), we offer substantial and reliable evidence supporting the perspective that CSR contracting is an efficient compensation design. It contributes to the sustainability of firms' development and the stability of the market while also generating value for various stakeholders of firms.

1.6. Structure of the thesis

This thesis consists of six chapters, beginning with the introduction chapter, the background chapter that provides the research context and related theoretical background, three empirical chapters that explore the impacts of CSR contracting, and the conclusion chapter. The rest of the thesis is organised as follows. Chapter 2 provides the background of our research and theoretical framework for empirical chapters. Chapter 3, entitled "*The rise of stakeholder-oriented compensation and share repurchases*", studies the influence of CSR contracting provisions on share repurchase decisions. Chapter 4, entitled "*Managerial stakeholder-oriented incentives and corporate risk-taking*", reveals the impacts of CSR contracting on managerial risk-taking, corporate policies, and firm performance. Chapter 5, entitled "*Managerial stakeholder-oriented incentives and stock price crash risk*", examines the relationship between CSR contracting and stock price crash risk and the subsequent changes in corporate reporting policy. Overall, the three empirical chapters follow a similar structure. Each empirical chapter begins with an introduction that delves into current debates, motivations, research questions, a concise summary of key findings, and research contributions. The introduction, then, is followed by several sections, including the literature review and hypothesis development, data sample and methodology, summary statistics, baseline results and robustness checks, analyses to address endogeneity concerns, additional empirical analyses, and the conclusion. Finally, Chapter 6 provides a comprehensive summary of the main findings throughout the thesis while discussing research limitations and providing directions for future research.

Chapter 2. Background and theoretical framework

2.1. Introduction

This chapter presents the background of this thesis and discusses the theoretical framework related to our empirical studies in Chapters 3 to 5. Specifically, Section 2.2 delves into the current social and environmental challenges that motivate demands for sustainable development from various stakeholders. These developments exert substantial pressure on firms to adopt CSR approaches that involve the integration of CSR metrics into executive compensation. Section 2.2 also discusses the perspectives of practitioners and academics regarding the advantages and current challenges associated with CSR-based compensation. Moving on, from a theoretical standpoint, Section 2.3 explains why firms embrace CSR in their business strategies, and why firms adopt CSR-based compensation. This section also discusses the potential impacts of CSR contracting from the perspectives of the optimal contracting hypothesis and the managerial power hypothesis. Last, Section 2.4 concludes the chapter.

2.2. Background

2.2.1. Environmental and social concerns in the 21st century

Climate change and social issues have become some of the most prominent topics of discussion among the public and mass media in the 21st century. The rapid population growth and industrialisation of human society, characterised by irresponsible raw material extraction, production and consumption of fossil energy, and excessive infrastructure development, have put immense pressure on the natural environment and ecosystems. In fact, these prolonged processes have resulted in global warming and severe climate change that entail sea level rise, extreme heat waves, and an increased occurrence of natural disasters. According to the 2023 climate change report of the Intergovernmental Panel on Climate Change (IPPC), the global surface temperature in the first 20 years of the 21st century is 0.99 degrees Celsius higher than the average temperature from 1850 to 1900.[7] IPPC's estimations reveal that if the global temperature increase is not limited

[7] Intergovernmental Panel on Climate Change (IPPC) is an organisation set up by the United Nations in 1988. The main objectives of this organisation are to provide science-based assessments of climate change,

to under 1.5 degrees Celsius, the world may face the risk of losing 14% of rare animal and plant species, a 40% to 50% increase in burnt area across Europe, and a 0.28 to 0.55-metre increase in the sea level. The most alarming prediction is that these changes may profoundly impact individuals and society globally. For example, IPPC estimates that 0.95 billion people living in drylands would experience heat stress and desertification, 24% of the world population would be exposed to flooding, and the world would require 63 billion dollars to ensure food security and restore crops damaged by climate change. More importantly, these problems also interrelate with other social and public health issues, such as poverty and income inequality, unemployment, and human trafficking. Typical examples of these issues include the migrant crisis in Europe in 2015 and the spread of coronavirus disease that has caused almost seven million deaths since 2019.[8]

2.2.2. Sustainable development demands: Insights from investors, regulators, and the general public

In light of this situation, investors, regulators, and the general public are prioritising the construction of a low-carbon economy and increasingly putting pressure on corporations to consider social and environmental issues when making decisions. From the investors' perspective, environmental, social, and governance (ESG) are three pillars of a framework that support investors in assessing corporate commitments towards sustainable development. Besides financial returns, investors are increasingly socially conscious and interested in aligning their investments with environmental, social, and ethical standards. For example, Gillan et al. (2021) report that, in 2019, more than 20 billion dollars have flowed into mutual funds that prioritise ESG-related investments. In line with this report, in 2023, 3826 institutional investors collectively managing 121.3 trillion dollars in assets have embraced the six "Principles for Responsible Investment."[9] These figures are substantially large, compared to 63 signatories who managed just 6.5 trillion

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its impacts, and suggestions for adaptation and mitigation. The 2023 climate change report is available at: https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf

[8] The aggregated statistics of 231 countries and territories are provided by Worldometer. The live data is available at https://www.worldometers.info/coronavirus/

[9] The Principles for Responsible Investment (PRI) is an initiative of the United Nations, launched in 2006. PRI aims to provide frameworks and standards for socially responsible investments globally. The signatories of PRI commit to its six principles, which generally require the consideration of ESG issues and ESG disclosure by the entities in which the signatories have investments. The mission, principles, and a list of PRI signatories are available at https://www.unpri.org/about-us/about-the-pri.

dollars of assets in 2006. While not legally mandated, investors' changing investment preferences incentivise corporations to transition to more responsible business models that align with investors' ESG expectations.

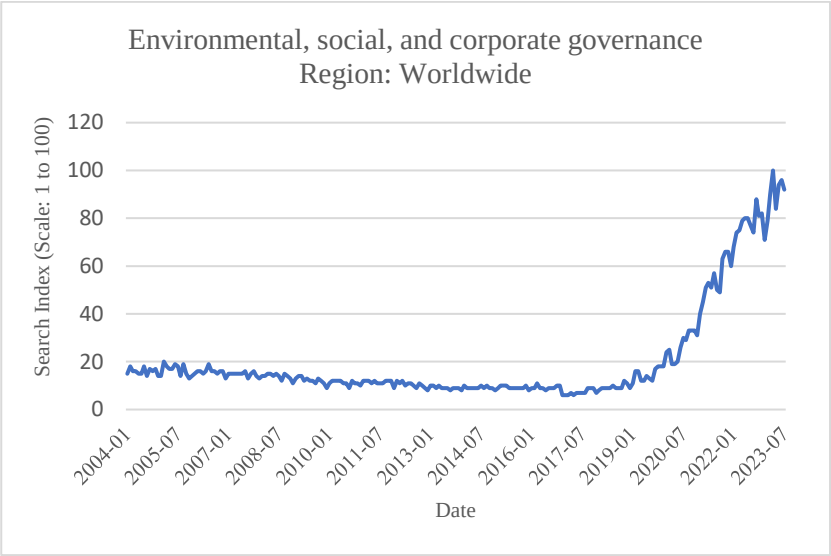
In recent years, the world has also witnessed rapid changes in legal systems and the emergence of multiple regulatory initiatives to promote sustainable development. Accordingly, the joint efforts among countries and territories aim to protect the environment, maintain societal and economic stability, and safeguard the interests of socially responsible investors. In fact, many governments have stated their road maps, approaches, and measures towards the target of net zero by 2050, according to the Paris Agreement in the 2015 United Nations Climate Change Conference (COP 21).[10] Moving toward this target, European Union (EU) member states reached an agreement in 2022 to implement the Carbon Border Adjustment Mechanism (CBAM). CBAM, the world's first carbon border tax, seeks to encourage foreign producers to internalize their emission costs and to compensate for the stricter climate-related regulations imposed on EU producers compared to non-EU producers. In the USA, given investors' increasing interests and reliance on firms' corporate social responsibility, the Securities and Exchange Commission (SEC) announced the formation of an enforcement task force in 2021 to identify gaps and misconduct relating to ESG investments and disclosures.[11] In 2022, SEC continued to propose a rule that requires firms to produce and improve their periodic climate-related reports, which disclose environmental performance and compliance, as a result of corporate operations, and the climate-related risks that may profoundly impact firms' financial performance.[12] The same movement is adopted by the EU to promote the production of more transparent corporate ESG reports, while the UK's Prudential Regulatory Authority (PRA) is urging top executives to consider and integrate social and climate risks in their firms' business and governance models (O'Connor et al., 2021).

[10] Net zero refers to achieving the balance between the amount of greenhouse gas emissions due to human activities and the amount of greenhouse gas removed from the atmosphere. Greenhouse gases can be removed from the atmosphere by adopting cleaner technologies, increasing energy efficiency, and using other measures to trap and store greenhouse gases.
An example of the UK government's proposals and policies towards a net zero target by 2050 can be found here: https://www.gov.uk/government/publications/net-zero-strategy
[11] The SEC's announcement can be found at https://www.sec.gov/news/press-release/2021-42
[12] The SEC's announcement can be found at https://www.sec.gov/news/press-release/2022-46

Overall, these examples showcase governmental efforts to establish ESG-related legal systems and standards that foster social and environmental well-being, while safeguarding investors' pursuit of social and ethical values.

The public and media also exhibit heightened awareness and interest in current social and environmental issues. For example, in June 2023, there was a large parade to celebrate the annual “Pride month” to raise social awareness and advocate for the rights and equality of the LGBTQ+ community. The parade occurred in Washington DC, USA, and approximately 50000 people participated in this event. Another example of the community effort to foster sustainability is the annual “Earth Hour” event that millions of people around the world support. The main objectives of this event are to turn off unnecessary lights and electrical appliances, thereby raising public awareness about climate change and other environmental issues. These examples demonstrate that the general public increasingly embraces the concept of sustainable development, and the norms of acceptable social and environmental actions are gradually shaped. In this process, the media plays an essential role in providing ESG information and facilitating the sharing of relevant opinions and ideas (Simon, 1992). For instance, Figure 2.1 illustrates the increased public interest in social and environmental issues, especially from 2019 to 2023, driving the search trend for the categorical topic "Environmental, social, and corporate governance" on Google platforms. Further, social media can swiftly flag irresponsible actions that are illegal or violate social norms, leading to heightened public scrutiny and increased regulatory interventions (Bansal, 2005). Overall, public interests and social media can play important roles in motivating and monitoring public entities' social and environmental behaviour, including corporations.

Figure 2.1. Search interest in the categorical topic "Environmental, social, and corporate governance" on Google platforms



Sources: Google Trends. The data is from Jan 2004 to July 2023. The data is available at: https://trends.google.com/trends/explore?date=all&q=%2Fm%2F0by114h&hl=en-US

2.2.3. Responding to external pressure: Corporations' motivation for corporate social responsibility

The widely recognised value of sustainable development and international efforts to address climate change have exerted immense pressure on corporations to adhere to social norms and relevant regulations. In this context, firms' failure to consider social and environmental concerns in the decision-making process can lead to detrimental impacts on the environment and the local community. As a result, significant legal liabilities and potential disruptions to corporate businesses are unavoidable. For example, the Mariana dam disaster in 2015 released a massive amount of toxic waste and mud into the surrounding area in Mariana, Brazil. This catastrophe affected the lives of several hundred thousand people and resulted in the deaths of 19 people. The main reasons for the collapse of the dam were inappropriate structure design and maintenance issues, thereby leading to a £36 billion lawsuit against the mining company BHP (Hodgson, 2023). In another example, Shell's 2021 announcement of continuing fossil energy production sparked substantial protests from its investors and climate activists, resulting in disruptions during its annual meeting in 2023. Using a sample of 1544 US public firms from 1990 to 2014, Xu and Kim (2022) summarise and report that the average legal liability relating to environmental

scandals is approximately 24.8 million dollars, which is a staggering number. Ethical and social norm violations also attract heightened scrutiny from members of the public, including customers and activists. For example, in April 2017, United Airlines was embroiled in a customer treatment scandal when its employees and security personnel violently removed a passenger from the aircraft cabin. This incident led to an extreme backlash, negative publicity, customer boycotts, and substantial financial damages for United Airlines, including a sharp decline in stock price, subsequent lawsuits, and expensive individual settlements.

In this context, an increasing number of firms are voluntarily adopting a strategic approach that integrates social and environmental objectives into their business models. This approach, known as Corporate Social Responsibility (CSR), encompasses actions firms take to address concerns and enhance the benefits of their stakeholders, such as customers, employees, and the local community (Gillan et al., 2021). It also aligns firms' business practises with external sustainability standards, thereby gaining stronger public support, building CSR reputation, and avoiding legal liabilities. For example, in August 2019, CEOs of 181 large US public companies signed a consensus on the Business Roundtable's Principles of Corporate Governance, which advocated for new stakeholder-oriented corporate purposes. Accordingly, the signatories outlined their commitments to adopting corporate strategies that prioritise the interests of and generate long-term value for their customers, employees, suppliers, communities, and shareholders.[13] According to the UK government's 2021 report on the environmental dimension of CSR, more than 2000 public companies, one-third of which are British companies in various sectors, have joined the race and disclosed detailed transition plans to achieve net-zero emissions by 2050.[14] In the social dimension of CSR, corporations are pursuing various CSR activities toward fostering employee safety and well-being, customer satisfaction, local employment and economic prosperity of communities. For instance, Masulis and Reza (2015) report that the average annual corporate

[13] "The Statement on the Purpose of a Corporate" of the Business Round Table is available at: https://opportunity.businessroundtable.org/ourcommitment/

[14] The report is available at https://www.gov.uk/government/news/third-of-uks-biggest-companies-commit-to-net-zero#:~:text=Globally%2C%20more%20than%202%2C000%20companies,front%20of%20the%20pack%20internationally.

donation to foundations is 6.5 million dollars, while 2.5 million dollars are donated to charities. In addition, the authors also report that 71% of Fortune 500 CEOs have affiliations with non-profit and charitable organisations.

2.2.4. The emergence of executive compensation tied to CSR performance

Despite these efforts, the "say-do gap" still exists, in which critics of corporate CSR strategies argue that firms have not genuinely dedicated themselves to promoting sustainable development, and there is still room to enhance the effectiveness of CSR activities. One of the most striking issues is that corporate leaders, especially CEOs, do not have sufficient incentives to consider social and environmental objectives in their agenda. Practitioners express concern that while pursuing CSR objectives requires corporate long-termism and continuous efforts, top executives are typically rewarded based on short-term financial performance. This practice is largely inconsistent with corporate statements of pursuing long-term responsible and sustainable development (Cook et al., 2023). To balance the gap between corporate long-termism and managerial short-termism, firms increasingly tie CEO pay to long-term, stakeholder-oriented performance measures, also known as CSR contracting. This practice represents one of the latest steps firms are taking to transition from the shareholder primacy governance model to the stakeholder governance model, known as stakeholderism (Bebchuk and Tallarita, 2022).

The methods by which firms select CSR metrics, set weighting schemes, establish performance targets, and measure actual CSR performance vary between firms and sectors. For example, Air Products & Chemicals, Inc. did not specify the CSR weighting scheme in 2019. However, this firm specified the rights of the compensation committee to adjust the total payout to executives to reflect their performance relating to safety, sustainability, and diversity issues.[15] American Electric Power Company, on the other hand, integrated clear CSR metrics in its scorecard of performance measures in 2022. Accordingly, the company linked the annual incentive compensation of all executives to employee safety (8%), environmental stewardship (2%),

[15] The proxy statement and details of executive compensation are available at https://www.sec.gov/Archives/edgar/data/0000002969/000120677419003839/apd3555111-def14a.htm#EXECUTIVECOMPENSATION19

customer satisfaction (10%), and culture and diversity (6%).[16] Unlike American Electric Power, Adobe, Inc. is a computer software company that does not expose its employees to workplace injuries, while its operations do not directly impact the environment. Consequently, CSR contracting provisions in the CEO contract focus on customer satisfaction and employee engagement, accounting for 8.24% of the total CEO compensation in 2012.[17]

Over the last two decades, CSR contracting has become more prevalent between firms (Flammer et al., 2019). In the US, we observe a rapid growth in CSR contracting among S&P 500 companies, rising from 7.4% in 2000 to 42.4% in 2019. This finding aligns with a survey study conducted by the Conference Board, which reported a continuous growth of CSR contracting among S&P 500 companies, from 66% in 2020 to 73% in 2021.[18] In the United Kingdom, 78% of board directors and senior executives advocate the use of CSR incentives, while 45% of FTSE 100 companies have already tied executive compensation to CSR metrics (O'Connor et al., 2021). Among these CSR pay adopters, 55% provide cash bonuses for superior CSR performance, and 50% integrate CSR contracting provisions into long-term incentive plans. Looking into the future, practitioners expect a more substantial development of CSR contracting. A recent Deloitte poll in 2021 reveals that 24% of companies expect to link long-term executive compensation to net-zero metrics in the next two years, while 20% expect to link short-term executive compensation to climate-related metrics (Deloitte, 2021).[19]

2.2.5. Navigating CSR contracting: Advantages and current challenges

Supporters of CSR contracting argue that this remuneration scheme is necessary to lengthen the horizon of CEOs and align this with corporate commitments to sustainable development (Cook

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[16] The proxy statement and details of executive compensation are available at https://www.aep.com/assets/docs/investors/AnnualReportsProxies/docs/22annrep/2023ProxyStatement.pdf

[17] The proxy statement and details of executive compensation are available at https://www.sec.gov/Archives/edgar/data/796343/000079634313000024/adbedef14a2013.htm#s52FE044D25301CD8CB66334FCDAF3DE0

[18] The Conference Board is an independent business membership and research association. It was founded in 1916 and headquartered in New York City, USA. The association collaborates with prominent corporations, organisations, and research institutes to provide research and practical solutions covering different business topics. The report on CSR contracting is available at: https://www.conference-board.org/pdfdownload.cfm?masterProductID=41301

[19] The report is accessible at: https://ukpages.deloitte.com/rs/676-RGI-700/images/Road-to-net-zero-incentivising-leadership-2021.pdf

et al., 2023). When the value of firms is partially derived from the payoffs of CSR activities, short-term financial metrics alone are insufficient to accurately assess CEOs' sustainability efforts and management capabilities. Additionally, in the absence of non-financial (CSR) metrics, CEOs may excessively focus on achieving short-term financial targets at all costs, even at the expense of sacrificing non-shareholding stakeholder value, which may aggravate future legal liabilities and deteriorate firms' reputations (Hong, 2017). Therefore, using CSR contracting is essential to accurately evaluate CEOs' contributions and promote managerial efforts toward sustainability.

Nevertheless, in practice, designing and implementing CSR contracting encounter various challenges and scepticism from practitioners and academics. First, concerning external challenges, ESG regulations are still evolving and not yet standardised globally, leading to significant gaps in ESG regulations between nations (Cook et al., 2023). This issue presents difficulties in applying consistent CSR metrics across years to conform to legal requirements, especially for multinational corporations. Additionally, this issue poses challenges in historical and inter-firm CSR performance comparison. Besides, collecting and constructing social and environment-related databases are particularly difficult, making it challenging to develop quantifiable CSR metrics and assess CSR performance objectively (Cook et al., 2023). Last, best practices in designing, setting, monitoring, and measuring CSR performance are still non-existent. The lack of best practices limits the immediate effective use of CSR contracting and requires firms to accumulate experience to use CSR metrics harmoniously with financial metrics (Derchi et al., 2020).

Concerning internal challenges, a recent analysis by PwC experts identifies three limitations in implementing CSR contracting (O'Connor et al., 2021). The first limitation relates to the scope of CSR metrics. If CSR contracting provisions consider numerous CSR dimensions in a performance scorecard, executive compensation may become unmanageable, and conflicts of interest between stakeholders may render CEOs' decisions ineffective. In contrast, if the scope of CSR contracting is too narrow, the interests of some important stakeholders might be overlooked. The second limitation relates to setting the weighting scheme of CSR contracting. O'Connor et al. (2021) argue that many CSR contracting provisions are set inappropriately, sometimes

significantly higher (10% to 15% higher) than the weight of financial performance. The third limitation involves setting CSR targets that are too low and not meaningful, resulting in CSR pay being relatively easy to achieve, compared to the pay for financial performance. As a result, CSR contracting may be viewed as a corporate attempt for "window dressing" and "greenwashing" purposes, providing limited actual value to the environment and society (Grewal and Serafeim, 2020). In line with this notion, Ho (2023) document that many firms are inclined to adopt CSR contracting as a trend following their peers, and they tend to focus more on the "S" (Social) dimension rather than the "E" (Environment) dimension.

Collectively, considering the stylised facts and insights into current challenges in implementing CSR contracting, the effects of this remuneration scheme remain attractive, yet doubtful. Indeed, there is still much ambiguity surrounding the impacts of CSR pay on top executives, especially CEOs, and whether this compensation design would simultaneously create value for shareholders and stakeholders. To adopt CSR-based compensation successfully, it is obvious that shareholders and the boards would require more time to learn from experience. Nevertheless, it is imperative to examine thoroughly the upside and downside of current CSR contracting practises and to reflect this on changes in corporate policies and outcomes. This examination becomes particularly necessary as CSR contracting is becoming an indispensable component of executive compensation globally. More importantly, given the rise of socially responsible investments, investigating CSR contracting and subsequent firm outcomes would provide recommendations to help regulators and the boards standardise this compensation practice, thereby safeguarding investors' interests, fostering market stability, and promoting a sustainable economy.

2.3. Theoretical framework

2.3.1. External drivers of CSR: The perspective of institutional theory

The concept of corporate social responsibility is closely linked to corporate missions aiming at initiating, promoting, and maintaining sustainable development. The World Commission on Environment and Development (WCED), which was created in 1983 to address environmental and developmental challenges globally, has defined sustainable development as a mode of development that addresses current needs without sacrificing the ability of future generations to

meet their own needs (WCED, 1987).[20] As discussed in Bansal (2005), any country's development is considered sustainable only when all three of the following principles are supported. First, the environmental integrity principle refers to ensuring the protection of the well-being and stability of the natural environment and preserving the functions and capabilities of ecosystems. This principle requires the implementation of various measures, such as pollution prevention, biodiversity preservation, and responsible use of natural resources, to mitigate the impacts of human activities on ecosystems and the natural environment. Second, the social equity principle requires that all members of society must have equal access to basic needs (e.g., food, clothing, accommodation) and higher-order needs (e.g., education, work opportunities, healthcare). Third, the economic prosperity principle suggests that economic activities generate value that can be distributed among members of society to enhance living standards and foster global prosperity.

Given the important roles companies play in the modern economy, it is crucial that companies embrace the three fundamental principles above and integrate them into corporate strategies and production. CSR, in fact, is a corporate management approach toward sustainable development. CSR may include firms' initiatives and investments to adopt pollution control and prevention to dispose waste from their production more responsibly ("Environmental integrity" principle), attend to the needs and concerns of internal and external stakeholders that may affect or be affected by firms ("Social equity" principle), and distribute earnings and value to stakeholders (e.g., shareholders, employees, customers) in a fair manner ("Economic prosperity" principle) (Freeman, 1984; Hart, 1995; Bansal, 2005).

Nevertheless, the intensity of firms' CSR programs strongly depends on several internal and external factors. First, from the institutional theory perspective, firms consider the social context in which they operate and attend to external demands for superior corporate social performance. By conforming to a set of beliefs and institutional norms that refer to social and environmental well-being, firms can protect and foster their legitimacy, which affects licences to operate in different societies and subsequent survivability (Meyer and Rowan, 1977). The expectations of

[20] The full report "Our common future" of WCED is available at https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf

social and environmental values in each society are shaped by its institutions, including government, legal systems, and social media. As suggested in DiMaggio and Powell (1983) and Bansal (2005), firms receive pressures exerted by external institutions through the three following channels and become more similar to each other when they strategically exhibit social and environmental responsibility.

First, the coercive channel, characterized by legal requirements, fines, and penalties, can harm firms' earnings and reputation if they fail to adhere to ESG regulations and meet the expectations of influential stakeholders. Firms that have previously violated the regulations may lose their legitimacy, resulting in increased scrutiny by governments and the public in the future. The increased scrutiny may threaten firms' businesses' ongoing access to resources and result in heightened legal liabilities in future violations. To protect their reputation and minimise legal liabilities, firms adhere to legal standards and strategically improve their CSR performance.

Second, the mimetic isomorphism channel refers to the phenomenon where firms, under pressure, tend to imitate the successful operating models and practices of their peers that the institutions generally accept. Accordingly, firms generally aim to meet social performance standards, rather than attempting to exceed these standards or outperform their peers (Bansal and Roth, 2000). Indeed, CSR initiatives often require much of firms' resources, while the outcomes are long-term in nature (Hart, 1995; Berrone and Gomez-Mejia, 2009). In this vein, because there is the risk that firms' distinctive efforts may fail to meet social and environmental standards and lead to unexpected sanctions, firms can safely follow certified and widely accepted management models of their peers to enhance their legitimacy quickly.

The third source of pressure arises from media attention. Accordingly, the media is considered the primary source of social and environmental information, reflecting editorial beliefs about social standards(Simon, 1992). By praising positive actions and reporting on events with negative social and environmental impacts, the news reaches a broad audience and gradually influences public opinion, thereby contributing to the establishment of legitimate corporate practices. In this context, if firms engage in irresponsible actions, it may lead to increased negative media coverage, thereby triggering subsequent adverse reactions from important stakeholders and leading to

tighter regulatory scrutiny (Bansal, 2005). Consequently, when faced with the threat of negative media coverage, firms are compelled to adopt CSR activities more genuinely (Bansal and Roth, 2000).

2.3.2. Internal drivers of CSR: The resource-based view

Firms not only promote CSR to conform to institutional norms and meet the demands of various stakeholders, but also have internal incentives to behave responsibly. Specifically, under the resource-based perspective, addressing social and environmental issues may create firms' competitive advantages that are rare, unique, difficult, and costly for competitors to imitate (Frynas and Yamahaki, 2016). These advantages are attributed to the increased rent-earning potential of corporate resources, including tangible and intangible assets, and corporate capabilities in managing and utilising these resources. Firms would quickly grab the opportunities to gain economic benefits from CSR because of the following factors.

First, CSR may enhance firms' capital management capabilities, reduce operating costs and pre-empt competitors. For firms that release gas emissions and effluent into the environment, pollution abatement may take the form of pollution control and pollution prevention (Hart, 1995). Pollution control is the end-of-the-pipe strategy in which firms use special equipment and technologies to trap, store, and process the production waste before its release into the environment. This approach involves integrating an additional production phase that does not alter firms' current production and operating processes. During this phase, harmful chemical substances are kept and treated separately, effectively reducing negative impacts on the environment and the local community. Nevertheless, pollution control requires the purchase of specialised equipment that is non-productive, expensive, and susceptible to legal and social changes while not allowing firms' production to be much cleaner than the minimum standards (Hart, 1995).

Pollution prevention, on the other hand, requires more extensive employee involvement and continuous improvements of the operating processes that result in less wasted production inputs and the removal of unnecessary processes. Firms following this strategy to build up capital

management capabilities often adopt the best practices and newest technologies that enable them to deal flexibly with unexpected social and legal changes and avoid frequent, expensive renovations of their capital assets (Bansal, 2005). In addition, the collaborative efforts between firms and stakeholders to optimise firms' operating models may contribute to the accumulation of knowledge and experience that foster stakeholder-oriented innovations (Bansal, 2005; Fu et al., 2020). In this vein, higher capital management capabilities translate into higher productivity and operating efficiency, resulting in significant cost-cutting.

Second, multinational firms that adapt and conform to the norms and regulations in different countries may accumulate experience and develop a set of best practices that leverage their competitiveness globally. These advantages facilitate business penetration into new markets, enable firms to acquire operating licences, and foster more efficient collaboration between regional offices (Bansal, 2005). Third, firms may benefit from CSR initiatives and investments if there are scale and scope economies (McWilliams and Siegel, 2001). Accordingly, firms rely on organisational slack, which refers to surplus resources retained beyond those required for current operations and obligations, to effectively engage with various stakeholders (Waddock and Graves, 1997). The organisational slack may include excess financial resources, human resources, physical resources, management time, and technologies. Larger organisational slack allows firms to maintain their social and environmental practices while having more discretion to develop effective CSR strategies. In this context, if scale economies and scope economies exist, firms can effectively reduce the average costs of CSR by spreading these costs over increased production sizes and the joint production of different but related products. As a result, firms can engage in social and environmental programmes more intensively and effectively while incurring lower costs (McWilliams and Siegel, 2000).

2.3.3. The optimal contracting view of CSR contracting

In the previous section, we have discussed the incentives that motivate firms' engagement with various stakeholders through CSR. Nevertheless, from the managers' perspective, the benefits of CSR are ambiguous and not immediate, thus discouraging effective managerial involvement in CSR. Specifically, CSR investments are expensive and require much of corporate resources that

would have been spent on other profitable investment opportunities. For example, adopting the pollution control strategy entails the purchase of expensive, non-productive technologies for production waste treatment, while implementing the pollution prevention strategy requires intensive involvement of employees, redesigning production processes, and additional managerial effort. However, unlike immediate financial gains, good social and environmental performance takes time to materialise. This uncertainty raises questions about whether firms will reap acceptable benefits from their continuous CSR investments (Hart, 1995; Berrone and Gomez-Mejia, 2009). More importantly, if CEOs divert firm resources to addressing stakeholders' concerns that subsequently weaken shareholder returns, CEOs are likely to be held responsible, and the market may perceive this failure is due to CEOs' shortcomings (Russo and Fouts, 1997). Consequently, CEOs tend to prioritise short-term and well-defined performance objectives over ambiguous CSR goals.

In this context, firms need to design an incentive that motivates CEOs to consider the interests and concerns of various stakeholders in their agenda. Accordingly, classic agency problems, such as moral hazard and adverse selection, arise due to information asymmetry between CEOs and shareholders. Because CEOs often possess more private information about firms and more expertise than shareholders, they may end up having considerable discretion in making corporate decisions and utilising shareholders' funds for their benefits without prioritising the interests of shareholders (Jensen and Meckling, 1976; Shleifer and Vishny, 1997). As a result, shareholders actively acquire additional information about the efforts of CEOs toward enhancing shareholder value. One approach is to make executive compensation contingent on specified performance targets in CEO contracts. In this context, the informativeness of performance measures plays a vital role in signalling CEO competence and their contributions to shareholder value (Holmstrom, 1979). Given that pursuing CSR activities can generate strategic advantages and enhance corporate legitimacy, linking CEO compensation to CSR performance goals, such as improving workforce diversity and environmental compliance, provides shareholders with valuable information to assess the contributions of CEOs. Indeed, to the extent that non-financial (CSR) performance requires long-term, continuous managerial efforts and does not provide immediate

financial impacts, the utilisation of short-term and retrospective financial metrics is not suitable to reflect such efforts (Ittner et al., 1997; Flammer et al., 2019). In contrast, linking CEO compensation to pre-specified CSR objectives allows shareholders to actively monitor CEO performance in relation to CSR performance thresholds. This approach enables shareholders to assess firms' progress toward meeting institutional norms (external incentives of CSR) and strategic CSR levels that can create distinct competitive advantages (internal incentives of CSR). Collectively, by serving as an indicator of the alignment between CEOs' actions and shareholders' long-term interests, CSR pay enhances the effectiveness of executive compensation contracts and promotes sustainable development.

Berrone and Gomez-Mejia (2009) discuss another important aspect, namely "risk-bearing", that identifies CSR contracting as a necessary provision for authentic stake engagement. Specifically, CEOs are characterised as strongly preferring short-term results over long-term sustainability. This preference is attributed to short-term career concerns (Gibbons and Murphy, 1992), the provision of short-term compensation that is a function of stock returns (Stein, 1989), and excessive pressure of the financial market on CEOs to report superior earnings (Skinner and Sloan, 2002). In contrast, CSR investments are long-term investments with uncertain results, which may put pressure on firms' short-term performance and increase the risk of losses for CEOs (Hart, 1995). If short-term financial performance disappoints or future social and environmental performance falls short of expectations, CEOs face compensation and career risks (Kothari et al., 2009; Cai et al., 2020). Without adequate compensation to offset these risks, CEOs may opt for symbolic CSR initiatives. In this context, the provision of CSR contracting is essential in compensating for the increased risk-bearing of CEOs and motivating stronger sustainability efforts.

2.3.4. The managerial power view of CSR contracting

Making CEO compensation contingent on CSR metrics, however, faces criticism for potentially supporting managerial rent extraction. A sufficient condition to make CSR contracting effective is that this compensation design should be a result of arm's length negotiation between the board of directors and CEOs (Bebchuk and Fried, 2006). In this process, the board should determine the

structure of CSR pay, including selecting appropriate CSR metrics, setting corresponding performance targets, and choosing an appropriate CSR weight to total CEO compensation. This process should consider shareholders' interests to ensure that the CSR incentive is adequate to motivate efficient managerial actions while remaining cost-effective (Bebchuk and Fried, 2003). Nevertheless, to the extent that CEOs may influence the selection of outside directors by recommending potential candidates, the ability of directors to remain independent in this arrangement is questionable (Pfeffer, 1992; Ittner et al., 1997). In addition, the monitoring role of directors may be compromised when there are strong social connections between directors and CEOs, resulting in compensation decisions that favour CEOs (Hwang and Kim, 2009). The biases in directors' compensation decisions may be exacerbated if directors have individual interests in social and environmental issues. For example, Masulis and Reza (2015) find evidence that CEOs strategically increase corporate donations to charities to build social connections with independent directors having charitable interests. This behaviour results in excessive executive compensation.[21]

Furthermore, CSR-based compensation may be prone to managerial manipulation because setting and monitoring CSR performance are complex tasks that require sufficient knowledge and relevant expertise, which directors often lack access to (Berrone and Gomez-Mejia, 2009). Indeed, setting and monitoring non-financial (CSR) objectives is more challenging than financial objectives due to their long-term nature with delayed financial impacts, reliance on science-based target-setting methods, the lack of historical data for past performance, and the absence of standardised performance measures and reporting methods (Ioannou et al., 2016). Given these challenges, CEOs may opportunistically influence directors' decisions to adopt CSR-based compensation that is excessively larger than the amounts estimated by economic determinants of their contributions.

[21] Masulis and Reza (2015) find that a 10% increase in corporate charity donations increases CEO compensation by 6.5 million dollars. The author reports that approximately 68.8% of firms in the sample have an overlap between charities having affiliations with independent directors and charities supported by firms.

Supporting this managerial power hypothesis, a recent study by Bebchuk and Tallarita (2022) summarises key facts regarding the implementation of CSR contracting among big corporations and expresses concerns about the actual effectiveness of this design. Accordingly, the authors document that the scope of CSR metrics adopted by S&P100 firms is narrow and mainly focuses on the most salient stakeholders of firms, including employees and the environment. Very few firms in their sample choose to direct CEOs' attention toward less salient stakeholders, such as the local community, customers, and suppliers. The limited range of CSR metrics raises concerns about the efficacy of this compensation approach in fostering firms' legitimacy, particularly when the interests of important stakeholders are overlooked.

Further, Bebchuk and Tallarita (2022) identify critical issues relating to transparency in reporting CSR performance and rewards. Accordingly, they posit that, to assure effective shareholder oversight, firms must disclose CSR contracting provisions transparently that meet the following requisites. First, proxy statements must contain clear definitions and interpretations of CSR metrics. All CSR goals should also be quantified to measure the actual performance objectively. Second, the social and environmental outcomes must be disclosed and reflected on the pre-specified targets to assess the competence of managers. Third, firms must disclose the contextual information of the adoption of each CSR metric to prove that the use of this metric is necessary to enhance the current CSR weaknesses. Nevertheless, most firms examined in Bebchuk and Tallarita (2022) do not consider these requisites, rendering external reviewability and monitoring unattainable. This view is in line with the findings in Eccles and Mavrinac (1995) that investors and analysts disregard non-financial performance measures because the disclosed information is susceptible to manipulation without sanction by external auditors. In addition, the lack of standardised reporting methods makes it challenging to calculate this measure consistently over time, rendering backward performance comparison difficult. Collectively, the managerial power hypothesis views CSR contracting as a puzzling compensation feature that potentially masks managerial rent extraction through stakeholder-oriented initiatives (Bebchuk and Fried, 2003). In this context, incentivised CEOs can capture generous compensation from shareholders in exchange for meaningless CSR performance.

2.4. Conclusion

This chapter has presented the background of this thesis and outlined the importance of thoroughly examining CSR contracting and its economic implications. In the face of climate change and emerging social concerns, society is increasingly embracing the concept of sustainable development, thereby exerting substantial pressure on firms to adopt CSR-related business models. Linking executive pay to CSR performance metrics is one of the recent initiatives to bridge the corporate "say-do" gap in pursuing sustainability. Nevertheless, the practical implementation of CSR-based compensation encounters several challenges, leading to scepticism among practitioners and academics.

From a theoretical viewpoint, this chapter explains why firms are incentivised to integrate social and environmental issues into their strategies and why adopting CSR contracting is necessary. According to the institutional theory, firms pursue CSR to conform to institutional norms that influence their legitimacy and access to important resources. Besides, the resource-based view suggests that firms have internal incentives to pursue CSR, as this approach can lead to rare and unique competitive advantages. Collectively, these internal and external drivers create strong demands for corporate CSR activities and, subsequently, the adoption of CSR contracting. Nevertheless, there are opposing views regarding the true effectiveness of CSR contracting. On the one hand, CSR contracting may be an efficient design that provides additional information about CEOs' commitments toward long-term value creation, thereby supporting shareholders in assessing managerial performance. On the other hand, CSR contracting may exacerbate managerial rent extraction, as its lack of transparency might render shareholder oversight on CEOs' performance ineffective.

To address this ongoing debate and provide a comprehensive understanding of the pros and cons of CSR contracting, we thoroughly examine its impacts in the empirical Chapters 3 to 5. These chapters aim to investigate the effects of CSR contracting on firm outcomes and the underlying mechanisms driving these relationships. Based on the corresponding empirical evidence, we conclude whether CSR contracting is an efficient or flawed remuneration scheme.

Chapter 3. The rise of stakeholder-oriented compensation and share repurchases

Abstract

This research examines the effect of corporate social responsibility (CSR)-based compensation, which rewards CEOs based on predetermined CSR performance targets, on repurchase decisions. By constructing a sample of S&P 500 firms that describes the use and the substantiveness of CSR contracting between 2000 and 2018, we find that CEOs incentivised by CSR contracting adopt more cautious repurchase decisions, reflected in the lower levels of share repurchases and the reduced probability of initiating new repurchase programs. This effect is stronger for firms with more investment opportunities and high cash flow volatility. Exploring the impact of CSR contracting on alternative payout policies, we did not find evidence suggesting that dividends are reduced for similar reasons as share repurchases or that dividends serve as a substitute for repurchases in distributing excess cash to shareholders. This result is consistent with the view about the financial flexibility advantage of share repurchases, compared to dividends. Collectively, our findings suggest that CSR contracting provisions incentivise a more conservative payout policy to preserve financial resources for effective stakeholder engagement.

3.1. Introduction

In recent years, share repurchases have become a dominant form of earnings distribution to shareholders. Indeed, the global value of share buybacks reached a record level of 1.31 trillion dollars in 2022, almost equalling the dividends that firms distributed to shareholders.[22] The motives behind the rapid development of share repurchases have been studied thoroughly by researchers and practitioners (Dittmar, 2000).[23] One commonly cited motive is associated with the design of executive compensation aiming at incentivising managers to maximise shareholder value, such as the use of option compensation (Kahle, 2002), earnings-contingent bonus (Cheng

[22] The data is provided in a press release of Janus Henderson. The value of share repurchases is approximately 94% of the value of dividends paid to shareholders in 2022. The detailed press release is available at https://www.janushenderson.com/en-gb/media/press-releases/global-share-buybacks-surge-to-a-record-1-31-trillion-almost-equalling-dividends/

[23] Grullon and Michaely (2004) document that expenditures for share repurchases grew at an average annual rate of 26.1% between 1980 and 2000, while dividends only grew 6.8% annually. The rapid growth of share repurchases continues to remain high and reached 22% in 2022, as reported by Janus Henderson.

et al., 2015), and the presence of vesting equity (Edmans et al., 2022). Nevertheless, an evolving trend in corporate governance emphasises the importance of having a balanced managerial focus on the interests of shareholders and stakeholders (Bebchuk and Tallarita, 2022). When top executives are increasingly motivated to protect stakeholders' interests by the presence of CSR criteria in their contracts, known as CSR contracting, a valid empirical question arises: Does this compensation design affect share buybacks and other corporate policies? This study aims to shed light on this issue by empirically investigating the relationship between CSR contracting in CEO compensation and share repurchases.

From one perspective, CSR contracting may reduce the number of shares repurchased by firms. While repurchases serve as an efficient means to distribute excess cash to shareholders and signal undervaluation (e.g., Vermaelen, 1981; Jensen, 1986), this activity can be myopic if it is financed by sacrificing valuable investments. Accordingly, CEOs are commonly characterised as having a strong preference for achieving short-term economic objectives. This preference, which aligns with that of shareholders having liquid portfolios, stems from CEOs' career concerns (Gibbons and Murphy, 1992), the provision of short-term compensation (Stein, 1989), and the excessive capital market pressure on CEOs to achieve short-term earnings targets (Skinner and Sloan, 2002). As a result, CEOs may prioritise short-term performance over long-term performance by, for example, manipulating investments in research and development (R&D) and innovation (Bushee, 1998; Cheng et al., 2015; Guo et al., 2019), compromising spending for employee well-being and environmental compliance (Caskey and Ozel, 2017; Z. Liu et al., 2021). At the same time, CEOs may distribute capital intended for long-term sustainable growth to shareholders through repurchases, which allows them to meet or beat earnings expectations, boost short-term stock prices, and ultimately increase managerial gains from equity-based compensation and earnings-contingent bonuses (Kahle, 2002; Hribar et al., 2006; Cheng et al., 2015; Edmans et al., 2022).

This myopic repurchase decision, however, has detrimental effects on stakeholder value. Specifically, unlike shareholders, stakeholders cannot unwind their affiliations with firms quickly and cost-effectively because their claims cannot be traded independently on the market (Cornell and Shapiro, 1987). As a result, stakeholder claims are illiquid and largely depend on firms' future

commitments. Given that repurchasing firms use up internal cash and increase borrowing to repurchase shares (Jensen, 1986; Stephens and Weisbach, 1998; Hovakimian, 2004; Wang et al., 2021), aggressive repurchase decisions may undermine firms' ability to initiate and maintain stakeholder-oriented investments, especially in the face of financial constraints when firms experience cash shortfalls (e.g., Daniel et al., 2010; Bliss et al., 2015; Cohn and Wardlaw, 2016; Xu and Kim, 2022). In this context, when CEOs are explicitly motivated by CSR contracting provisions, they should prioritise preserving financial resources to finance future stakeholder-oriented investments, rather than aggressively distributing excess capital through share repurchases. More importantly, unlike dividends, share repurchases do not represent an ongoing, implicit commitment to distribute cash flows to shareholders. Thus, CEOs can safely avoid share repurchases without triggering adverse market reactions (Jagannathan et al., 2000). We refer to this argument as the stakeholder-based explanation of the effect of CSR contracting on repurchases.

It is also essential to consider an alternative viewpoint of the agency critique of CSR contracting. Accordingly, CSR contracting may be firms' strategy to publicly show that they are acting socially responsibly for the benefit of various stakeholders. Nevertheless, the inclusion of CSR criteria in executive compensation cannot cover the interests of all salient stakeholders since these interests potentially conflict with each other.[24] Simultaneously, the complexity and multidimensionality of this incentive structure, which includes multiple CSR and financial criteria, could undermine the effectiveness of CSR efforts (Flammer et al., 2019; Bebchuk and Tallarita, 2022). Moreover, the lack of disclosed context, measurability, and specificity of CSR goals and actual performance deteriorates the outsiders' reviewability and oversight (Bebchuk and Tallarita, 2022). In this vein, CSR contracting may exacerbate agency problems by increasing CEOs' personal wealth in exchange for limited firm value created. Incentivised CEOs may spend little effort to achieve unchecked and worthless CSR performance. They may even overinvest in CSR-related projects

[24] For example, local communities are interested in how a firm's operations affect local employment and environmental issues, while customers have short-term claims about pricing and after-sales customer services. If the firm engages with customers and keeps product prices low by outsourcing manufacturing with an international partner, this activity may conflict with the target of contributing to long-term job creation in the local area where the firm operates.

to buy public support and disguise weak financial performance. Under this agency-based view of CSR contracting, incentivised CEOs may also reduce share repurchases and use the proceeds to engage in value-destroying investments.[25] This view is consistent with the view of Jensen (1986) and Grullon and Michaely (2004) that an important motive of share repurchases is distributing free cash flow to shareholders to curb overinvestment by management. We refer to this argument as the agency-based explanation of the effect of CSR contracting on repurchases.

On the contrary, it is possible that CSR contracting may positively affect share repurchases. CSR contracting-induced investments and initiatives can only pay-off in the long run, and it takes time for firms to learn how to use CSR contracting effectively. These factors contribute to the increased uncertainty associated with CSR-based compensation (Berrone and Gomez-Mejia, 2009; Derchi et al., 2020). In the event of a disappointed CSR performance that undermines firms' reputation, the labour market may perceive this failure as managerial shortcomings, thus amplifying CEOs' career concerns (Cai et al., 2020). In response to higher compensation and career uncertainty, CEOs are inclined to increase repurchasing shares for several reasons. First, share repurchases may signal undervalued stock, which usually boosts short-term stock prices (Vermaelen, 1981; Ikenberry et al., 1995). As a result, CEOs with large exercisable options and vested equity are likely to repurchase more frequently and more significantly to monetise their illiquid holdings (Kahle, 2002; Edmans et al., 2022). Second, CEOs may behave myopically to increase the chance of meeting non-CSR performance criteria to compensate for the compensation risk arising from CSR contracting. It follows that CEOs may increase repurchases to temporarily boost reported earnings per share (EPS) and earn EPS-contingent bonuses (Hribar et al., 2006; Cheng et al., 2015).

Diverse viewpoints on the impact of CSR contracting on share repurchases and subsequent outcomes motivate our study. To shed light on the above question, following Stephens and Weisbach (1998), Jagannathan et al. (2000), and Skinner (2008), we first construct measures of the value of shares that firms repurchase during a fiscal year. The primary measure is the purchase

[25] CSR-related spending may also be value-destroying. For example, Masulis and Reza (2015) provide evidence that corporate giving to charities is exploited by CEOs to maximise their compensation and reduce managerial turnover. This opportunistic action adversely impacts firm performance.

of shares recorded in the Compustat database, scaled by the total value of book assets. Other measures, such as the changes in common treasury stock and the changes in the number of shares outstanding in the CRSP database, are also used to verify the robustness of our baseline results. To measure CSR contracting, we hand-collect data from annual proxy statements (form DEF 14A) of Standard & Poor's 500 (S&P 500) companies from 2000 to 2018. We focus on two aspects of CSR contracting: the presence of CSR criteria in CEO compensation (i.e., *CSR contracting*) and the substantiveness of these provisions (i.e., *% CSR contracting*). *CSR contracting* is an indicator for firms that link CEO compensation to CSR criteria. *% CSR contracting* is the ratio of CSR-based compensation to total compensation. Using these measures, we find evidence that the value of share repurchases reduces when firms adopt CSR contracting and when the substantiveness of this compensation design increases. The adverse impact of CSR contracting on share repurchases is economically significant. For firms linking CEO compensation to CSR criteria, they reduce repurchases by approximately 247.76 million dollars. For one percentage increase in CSR-based compensation, firms reduce repurchases by approximately 70.61 million dollars. After implementing several robustness checks, our findings continue to hold, cementing the notion that CSR pay induces CEOs to reduce share repurchases.

To further examine whether the repurchase-reduction effect of CSR contracting is due to the stakeholder-based explanation or the agency-based explanation, we implement cross-sectional heterogeneity analysis by conditioning the impact of CSR contracting on firms' cash flow volatility and investment opportunities. Consistent with our predictions, the effect of CSR contracting on repurchases is not equal across all circumstances. Specifically, firms with higher earnings volatility tend to reduce share repurchases more significantly. In addition, firms with CSR contracting tend to decrease share repurchases further if they have more investment opportunities. These findings lend support to the notion that CEOs with CSR contracting provisions in their contracts avoid aggressive repurchases to save financial resources for strategic investments that benefit stakeholders and shareholders.

We further find evidence supporting the stakeholder-based explanation by directly examining the agency-based hypothesis. Under the agency-based explanation, CSR-contingent compensation

aggravates the agency problems, and incentivised CEOs exploit CSR contracting to reduce repurchases and overinvest. This hypothesis has an important implication that the negative impact of CSR contracting on repurchases should be more significant for firms with lower corporate governance quality. We test and find no evidence supporting this implication, thus partially ruling out the agency-based explanation.

Given the concerns of omitted variable bias and reverse causality, our baseline findings may not be conclusive about the causal link between CSR contracting and share repurchases. First, some important firm-specific and industry-specific factors that simultaneously influence CSR contracting and share repurchase decisions may be omitted. Indeed, if the corporate decision to adopt CSR contracting is endogenous, the conclusion about the causal relationship would be spurious. Furthermore, the reverse causality may exist, meaning that firms reducing share repurchases ex-ante may adopt CSR contracting ex-post. This is feasible as they retain more financial resources for subsequent CSR investments. We implement a series of rigorous robustness checks to address these concerns and establish a reliable causal relationship.

First, we implement the difference-in-differences analysis using the first year of CSR contracting adoption as a treatment event. Specifically, firms in the treatment group (i.e., firms with CSR contracting) are one-on-one matched with firms in the control group (i.e., firms without CSR contracting), ensuring that all observable firm-specific characteristics are statistically indifferent. We limit our analysis to five years before and five years after the treatment to ensure that the effect of this event is strong and relevant. This procedure removes possible impacts of observable confounders on share repurchases and enables us to isolate the variation of repurchases after the treatment. We also provide evidence justifying the parallel trend assumption that, after controlling for all observable factors, share repurchases of treated and control firms exhibit the same trends leading up to the treatment and diverge after that. Overall, the results suggest that first-time CSR contracting adopters significantly reduce share repurchases, compared to their matched non-adopters.

Second, we implement a test to alleviate reverse causality concerns. Specifically, instead of regressing share repurchases on past CSR contracting, we reverse the specification and regress

CSR contracting on past share repurchases. The rationale behind this analysis is that if reverse causality exists, the coefficient of share repurchases should be statistically significant. We do not find evidence supporting this possibility, thus alleviating the reverse causality concern. Overall, the above evidence cements our argument that CSR contracting induces CEOs to reduce share repurchases, and this conclusion is unlikely to be affected by omitted factors or reverse causality. Nevertheless, we should be cautious when interpreting the results due to the possible non-random assignment of CSR contracting between firms and the limitation of our sample size to the top 500 US companies by market capitalisation. Thus, a definitive causal relationship should not be drawn from the above tests.

In the last analysis, we explore whether firms adjust other payout policies when reducing share repurchases. If CSR contracting adopters reduce share repurchases to prioritise CSR investments, firms may also reduce dividends for the same reason. Contrary to this view, firms may also increase dividends to substitute for share repurchases in initiating a cash payout instead of using the proceeds to fund strategic investments. We do not find evidence supporting these possibilities using the baseline specification and difference-in-differences analysis. This finding supports the notion that dividends are sticky, and CEOs avoid cutting dividends to keep firms attractive to investors, even if they must pass up other profitable projects (Brav et al., 2005; Daniel et al., 2010). Simultaneously, our results support the view of Jagannathan et al. (2000) that firms are not likely to substitute share repurchases for dividends if they prefer financial flexibility. This is because dividends are considered an ongoing commitment to distribute permanent cash flows, and cutting dividends may trigger adverse market reactions.

Overall, this study contributes to the literature in several ways. First, we add to the literature that links executive compensation to share repurchases. Dittmar (2000) and Fenn and Liang (2001) document that executives with substantial stock option holdings often opt for share repurchases over dividends. This preference stems from the fact that repurchases do not dilute the per-share value when executives choose to exercise these options. Consistent with this view, Kahle (2002) show that firms repurchase more frequently and more significantly if the number of executives' exercisable options is more substantial. Focusing on another aspect of executive compensation,

Edmans et al. (2022) find that vesting equity is positively associated with the frequency and intensity of repurchase programs. They show that CEOs opportunistically monetise their vested equity after repurchase announcements to capture the market's favourable reactions. In addition, the presence of financial metrics in CEO compensation may also affect share repurchases. For example, EPS-contingent bonuses motivate CEOs to repurchase shares to boost reported EPS, meet the performance target, and beat the earnings benchmarks (Hribar et al., 2006; Cheng et al., 2015). The common view of the above studies is that the provision of short-term incentives may motivate myopic behaviour of executives (via share repurchases) that may destroy firms' long-term value.

Deviating from this perspective, this study shows that integrating CSR metrics in executive compensation can offset the consequences of share repurchases induced by myopic CEOs. We interpret our results that CSR contracting motivates CEOs to act prudently by preserving financial resources for long-term strategic investments that create value for various stakeholders. To achieve this objective, incentivised CEOs may reduce share repurchases, thereby preserving internal cash and debt capacity. This strategy minimises the adverse impact of the downside risks, such as financial constraints, on the illiquid claims held by stakeholders. Consequently, firms can consistently fulfil their long-term commitments and safeguard stakeholders' interests.

Second, our study relates to the literature that considers a firm's ability to finance investment opportunities as a determining factor in repurchase decisions. Chen and Wang (2012) find that financially constrained repurchasers exhibit a significant investment reduction, poorer operating performance, and higher financial distress risk. Their findings imply that constrained firms may adopt a more conservative repurchase policy to retain cash and reduce costly borrowing to maintain profitable investments. Exploring the role of payout reduction directly, Bliss et al. (2015) use the 2008-2009 financial crisis to examine how firms alter payout policies to response to financing shocks. The authors document that firms reduce repurchases to build strong cash reserves and fund strategic investments. They argue that executives consider repurchase reduction as an alternative form of financing in hard times, since financing shocks make external capital excessively expensive. Similar to this view, our findings support the notion that CEOs with CSR

contracting strategically reduce share repurchases to preserve financial resources for stakeholder engagements. Nevertheless, in relation to Bliss et al. (2015), a notable distinction arises as the real effects of conservative repurchase decisions may not be observable in our study. Specifically, unlike dividends, share repurchasing is not a firm's ongoing and implicit commitment to future regular repurchases. Therefore, the impacts of cash savings from repurchase reduction on firm operations, as reported by Bliss et al. (2015), can only be observed among regular share repurchasers. In contrast, similar impacts cannot be observed among firms that have not initiated repurchase programs. In this context, reducing repurchases should not be considered an alternative form of financing. Because we focus on the presence of CSR pay as a general practise, rather than focusing on a small group of firms having regular repurchase policies, we do not delve into investigating the impact of cash savings from repurchase reduction on firm policies and outcomes as implemented in Bliss et al. (2015).

Third, our study contributes to a strand of a study about firms' choice of payout method between share repurchases and dividends. Specifically, Jagannathan et al. (2000) show that firms choose to distribute earnings to shareholders through share repurchases, rather than dividends, when the benefit of financial flexibility is highest. Indeed, unlike dividends, repurchases do not present an implicit commitment to future payout. Consistently, in a study by Brav et al. (2005), managers express that they would consider repurchases after making profitable investments, while the level of dividends is sticky, "untouchable and is on par with initiating new investment".[26] In addition, Daniel et al. (2010) find that when firms face cash shortages, the majority choose to reduce investments and borrow more, whereas only 6% of firms decrease dividends. Our findings complement this view by showing that CEOs with CSR contracting only refer to repurchase reduction as a strategy to preserve financial resources, but not dividend reduction. Moreover, the repurchase reduction proceeds are directed towards funding new investments, rather than being allocated for increased dividends to shareholders. Collectively, our results emphasise the

[26] Brav et al. (2005) report that 80% of interviewed CFOs view the availability of profitable investments as an important determinant of repurchase decisions.

stickiness of dividend policy and managerial preferences for using repurchases over dividends when the benefit of financial flexibility is essential.

Fourth, we contribute to a burgeoning literature on the economic implications of CSR contracting. Although the adoption of CSR contracting has been growing quickly over the last decade, little is known about the economic implications of this novel compensation design. A notable study by Flammer et al. (2019) shows that CSR contracting motivates executives to adopt a longer-term horizon and dedicate themselves to improving CSR performance and green innovation. This novel compensation design also attracts socially responsible investors, highlights long-term innovation-focused strategies, and lessens turnover-performance sensitivity (Tsang et al., 2021; Qin and Yang, 2022). In contrast to the optimistic view about executive pay for CSR performance, Bebchuk and Tallarita (2022) maintain a sceptical view of its effectiveness. They argue that CSR contracting provisions primarily target a limited stakeholder group and lack the measurability and reviewability for external CEO performance assessment. Nevertheless, our findings are consistent with the view of Flammer et al. (2019) that CSR contracting generates value for various stakeholders. Our findings suggest that incentivised CEOs prioritise stakeholder interests by maintaining financial resources, at least partly through reduced share repurchases.

This study is organised as follows. Section 3.2 provides background and develops hypotheses. Section 3.3 describes the data sample, variable construction, and research settings. Section 3.4 discusses the baseline results, robustness checks, and cross-sectional heterogeneity analyses and examines alternative explanations of the relationship. Section 3.5 addresses endogeneity concerns. Section 3.6 examines the impact of CSR contracting on dividend policy. Section 3.7 summarises the empirical findings and concludes.

3.2. Literature review and hypothesis development

3.2.1. Motives of share repurchases and the related costs

Why do firms repurchase shares? Extant literature shows that a firm may repurchase shares for several reasons. First, executives may repurchase to signal market participants that a firm's stock is undervalued. According to Miller and Modigliani (1961), the firm may use a payout policy

(e.g., dividends and repurchases) to reveal positive information about its prospects and future positive earnings. Due to the inherent information asymmetry between insiders and outsiders, investors may not fully recognise the firm's prospects, leading to the undervaluation of the firm. To correct this misbelief, managers utilise share repurchases to convey information to the public. Typically, the stock price tends to increase after repurchase announcements, although the market reaction may not be sufficient to correct the previous mispricing (Vermaelen, 1981; Ikenberry et al., 1995). Second, managers may repurchase shares to disrupt takeovers or deter the risk of being taken over by other firms (Billet and Xue, 2007). Specifically, share repurchases may remove investors with a low valuation of the firms while leaving investors with a relatively higher valuation. Through this strategy, managers increase the cost of purchasing shares for potential acquirers and reduce the supply of shares needed for potential takeovers (Bagwell, 1991). Third, the firm may repurchase to adjust its capital structure by reducing its equity and increasing the leverage ratio (Dittmar, 2000). Fourth, the firm may use repurchases to fund executive compensation programmes, such as exercisable options and vested equity, since the market tends to react positively toward repurchase announcements. By doing so, the firm also avoids the dilution effect of the per-share value if executive options are exercised (e.g., Dittmar, 2000; Fenn and Liang, 2001; Edmans et al., 2022). Inflating earnings per share to meet earnings benchmarks is another important motive for share repurchases, although the firm acknowledges that investors significantly discount the repurchase-induced component of earnings surprises (e.g., Brav et al., 2005; Hribar et al., 2006; Cheng et al., 2015).

Besides these reasons, an important motive for share repurchases is to reduce agency costs of free cash flow. When the firm has excess cash that is more than enough to fund all available investment projects, managers tend to use the capital inefficiently (e.g., investing in negative net present value (NPV) projects) (Easterbrook, 1984; Jensen, 1986). One solution to mitigate this issue is distributing the excess cash to shareholders. While share repurchases can be funded by internal excess cash, repurchasers can subsequently increase borrowing to fund investments and operational activities without retaining the proceeds. The added debt reduces managerial

discretion in spending excess cash on value-destroying projects and encourages more effective organisational management to meet debt payments.

However, this strategy also comes with costs. Following share repurchases, firms run the risk of depleting their cash reserves and increasing leverage ratios, which may result in decreased financial flexibility. From this perspective, repurchasers may not have a strong cash balance and sufficient debt capacity to capture newly emerged investment opportunities. Firms may also lack sufficient liquid resources to swiftly respond to unexpected market changes, such as financial crises, that make external financing costly. In this scenario, increasing borrowing or cutting back on expected investments, even when these investments are profitable, becomes inevitable (Daniel et al., 2010). Supporting this perspective, Chen and Wang (2012) provide evidence that constrained repurchasers experience a significant reduction in the level of investments and poorer abnormal operating performance, compared to unconstrained firms. Consistently, using international data on share repurchase legalisation from 1985 to 2010, Wang et al. (2021) find that repurchasers are more likely to use internal cash, rather than issuing more debt, to buy back shares. These firms exhibit reduced investments (e.g., capital expenditures, research and development), lower profitability, and lower growth.

3.2.2. CSR-based compensation and share repurchases

According to the stakeholder theory, the firm's claimants go beyond shareholders to include other constituencies, such as employees, customers, suppliers, and the local community. It is also the firm's responsibility to create value and address conflicts of interests between shareholders and stakeholders, and between stakeholders themselves (Cornell and Shapiro, 1987). On the one hand, as discussed by Gao et al. (2021), shareholders are residual and liquid claimants of firms because they have the ability to unwind their affiliations (e.g., shareholdings) with firms quickly. In addition, the payoffs from shareholders' investments in firms are asymmetric (i.e., investment profits may substantially exceed the potential losses). These characteristics motivate shareholders to focus on short-term profits, potentially leading executives to sacrifice long-term sustainability for immediate performance. Indeed, the market overreactions to negative earnings surprises (Skinner and Sloan, 2002), the provision of short-term compensation linked to stock prices (Stein,

1989) and career concerns (Gibbons and Murphy, 1992; Kothari et al., 2009) contribute to the occurrence of managerial short-termism. For instance, myopic CEOs may repurchase shares aggressively to inflate EPS and earn EPS-contingent bonuses (Hribar et al., 2006; Cheng et al., 2015). Consequently, this approach depletes valuable capital that could have been allocated to strategic investments that are essential for long-term sustainability, such as investments in R&D, employee safety, and environmental compliance (Bushee, 1998; Roychowdhury, 2006; Caskey and Ozel, 2017; Z. Liu et al., 2021).

On the other hand, stakeholders are characterised as having illiquid claims against firms. Accordingly, stakeholders encounter challenges in promptly and inexpensively severing their affiliations with firms, as their claims lack independent tradability (Cornell and Shapiro, 1987). As a result, stakeholder interests largely depend on firms' ability to honour future commitments. In this context, managerial short-termism is particularly harmful to stakeholders' interests because managers are willing to forgo long-term CSR investments to pursue short-term profits. The impact worsens if firms experience financial constraints that leave them with insufficient financial resources to safeguard stakeholders' interests (Cohn and Wardlaw, 2016; Xu and Kim, 2022).

Recently, firms increasingly integrate CSR metrics in CEO compensation, aiming at aligning managerial interests with those of stakeholders. In this vein, incentivised CEOs should focus more on the concerns of illiquid stakeholders and avoid behaving myopically. It turns out that incentivised CEOs would preserve more financial resources toward strategic investments, including CSR-oriented projects, thereby fostering stakeholder-oriented long-term growth. Given that share repurchases consume internal cash and deplete firms' debt capacity to react quickly to unexpected changes and new investment opportunities, we expect that incentivised CEOs would adopt more conservative repurchase decisions when initiating CSR projects. This perspective is consistent with a survey study by Brav et al. (2005), indicating investment opportunities as a crucial factor influencing share repurchases. For firms that repurchase regularly, Bliss et al. (2015) provide evidence that managers may consider reducing repurchases as an alternative means of financing investments during market downturns. Based on these arguments, we formulate the following hypothesis.

Hypothesis 1. CSR contracting reduces share repurchases.

If incentivised CEOs reduce share repurchases to maintain CSR investments, we should expect this effect to be most substantial when the value of repurchase reduction is highest. Accordingly, increased earnings volatility raises concerns that firms may lack sufficient cash to safeguard stakeholders' interests, thereby elevating the importance of minimising share buybacks. In line with this view, Skinner (2008) document a strong relation between share repurchases and earnings, in which repurchases quickly adjust after earnings changes. As a result, we conjecture that the effect of CSR contracting on share repurchases is stronger if a firm's earnings are more volatile.

Hypothesis 2. The effect of CSR contracting on share repurchases is higher if earnings are more volatile.

Similarly, if more available investment opportunities exist, firms would have a higher demand for capital. As reported by Brav et al. (2005), 80% of interviewed CFOs responded that the availability of profitable investment significantly affects their repurchase decisions. In this vein, we predict that incentivised CEOs would further reduce repurchases to preserve resources if the availability of investment projects is higher.

Hypothesis 3: The effect of CSR contracting on share repurchases is higher if a firm has more investment opportunities.

Although the predicted advantage of reducing repurchases is attractive, two important questions arise: First, why do incentivised CEOs choose to reduce repurchases instead of dividends? Second, do CEOs reduce repurchases and subsequently increase dividends as an alternative way to distribute earnings to shareholders? The answer perhaps lies in the financial flexibility advantage that share repurchases hold over dividends. Dividends represent an implicit ongoing commitment to future payouts by firms (Jagannathan et al., 2000). Cutting dividends is often followed by a negative overreaction of the market, as this action signals poor financial health and the potential overinvestment by management (Denis et al., 1994). Conversely, increasing dividends is costly as it implies firms' implicit commitments to maintain future payouts at the

increased level. Hence, managers tend to maintain dividend payments very conservatively, even if they must sacrifice profitable investments in the event of cash shortfalls, to attract investors and maintain access to the capital market (Daniel et al., 2010). Meanwhile, managers have the full flexibility to adjust repurchases without triggering an adverse market reaction (Skinner, 2008). Consequently, we hypothesise that CEOs with CSR contracting will only modify their repurchase decisions while maintaining the dividend policy intact.

Hypothesis 4: CSR contracting has no impact on dividend policy.

3.3. Data sample and methodology

In this section, we describe the construction of the main variables used in this study, including measures of CSR contracting and repurchases. We also discuss control variables included in the baseline analysis and alternative measures of repurchases included in the robustness checks. Then, we discuss our baseline specification and provide summary statistics and a correlation matrix between variables.

3.3.1. Sample selection

As discussed in Section 1.4 of Chapter 1, we construct our CSR contracting dataset by hand-collected data from the "Compensation Discussion and Analysis" section in proxy statements (Form DEF14A) that firms file with the US Securities and Exchange Commission (SEC). Specifically, we focus on the top 500 US firms constituting the S&P 500 index from 2000 to 2018. We access and collect the data from SEC's EDGAR database.[27] This data strategy is consistent with Flammer et al. (2019) and Qin and Yang (2022), which allow us to keep the data collection process manageable. Moreover, US firms in our sample are significantly larger and more visible to the public than other firms. Thus, their compensation strategies would probably have considerable impacts on smaller firms that are not included in the sample. Collectively, findings associated with this data sample can provide reliable indications about the effects and economic implications of CSR contracting.

[27] The proxy statements can be accessed at https://www.sec.gov/edgar/search/

Next, we supplement this hand-collected data with additional variables from other databases. In particular, the accounting data comes from the Compustat database. The stock data (e.g., stock prices, the number of shares outstanding, and CRSP market index returns) comes from the CRSP database. CEOs' stock and option ownership data comes from the ExecuComp database. All control variables are winsorized at the 1st and 99th percentiles to reduce the potential impact of outliers. We also drop firm-year observations with negative sales and total assets and those containing missing values of variables included in the baseline specification. Collectively, this procedure leaves us with a dataset of 7901 firm-year observations, with 2149 firm-year observations containing information about the presence and the substantiveness of CSR contracting.

3.3.2. Variable construction

3.3.2.1. CSR contracting

As discussed in Section 1.4 of Chapter 1, because the disclosed details and components of CSR contracting vary between firms, we focus on the two common factors that are mostly delineated in all proxy statements: the presence and the substantiveness of CSR-based compensation.

Following the data collection strategy specified in Flammer et al. (2019), we consider a firm to have CSR contracting provisions if this firm links CEO compensation to performance criteria relating to one or more of the following categories: "Community, Compliance with ethical standards, CSR, Diversity, Employee well-being, Energy efficiency, Environmental compliance, Environmental goals, Environmental performance, Environmental projects, Greenhouse gas emissions reductions, Health, Performance relative to a corporate responsibility index, Product safety, Reduce injury rates, Safety, and sustainability" (Flammer et al., 2019, p.1105). Then, we construct the variable CSR contracting. Accordingly, *CSR contracting* is an indicator variable that equals one if a firm integrates at least one of the listed CSR criteria above, and zero otherwise.

Although the binary *CSR contracting* variable provides a straightforward description of the presence of CSR-based compensation, it does not capture the substantiveness of CSR contracting. It is possible that some firms adopt CSR contracting merely for a symbolic reason, while other

firms provide a large package of CSR-based compensation that emphasises the need for CSR performance improvement. Besides, having additional measures of CSR contracting improves the reliability of our results, compared to a single-measure research setting. Thus, to examine the substantiveness of CSR contracting and its variation, we construct a second variable, *% CSR contracting*. *% CSR contracting* is a continuous variable that is the ratio of CSR-based compensation to the total CEO compensation. For firms that adopt CSR contracting but do not specify the percentage of CSR contracting, we note the corresponding *% CSR contracting* values as null. For firms that do not adopt CSR contracting, the corresponding *% CSR contracting* values are zero. This procedure reduces the number of observations in our baseline specifications to 6417 firm-year observations when using *% CSR contracting* as the main regressor.

3.3.2.2. Measures of share repurchases

Measuring share repurchases is challenging since most available methods tend to overestimate or underestimate the actual value of repurchases (Stephens and Weisbach, 1998; Jagannathan et al., 2000). Therefore, it is important to use multiple repurchase proxies to ensure the robustness of the results. First, following Jagannathan et al. (2000), we use the "Purchases of Common and Preferred Stock" (Compustat item #115), scaled by total book assets of firms as the baseline measure of repurchases. We refer to this measure as *Repurchases*. This measure captures the sum of dollars spent on repurchases of common and preferred stocks in a fiscal year. Another measure constructed from the Compustat database is the change in treasury stock. We use this measure for the robustness checks. Following Skinner (2008), we measure *Treasury Repurchases* as the increase in the common treasury stock (Compustat item #226) scaled by total book assets. If, in any year, *Treasury Repurchases* equals zero or is missing, the corresponding value is calculated as the difference between stock purchases and stock issuances (Compustat item #115 – Compustat item #108) scaled by total book assets. If both the increase in the common treasury stock and the difference between stock purchases and stock issuances are negative, the corresponding value of *Treasury Repurchases* equals zero.

While the calculation of Compustat repurchase measures is straightforward, these measures are likely to overestimate the actual share repurchases of firms.[28] In the robustness check section, we test another measure of repurchases constructed from the CRSP database. Following Stephens and Weisbach (1998), we first calculate the aggregated monthly decreases of the number of shares outstanding reported in the CRSP database, adjusted for stock splits. If there are months where the number of outstanding shares increases, we do not offset these increases with decreases from other months. This is because even when firms repurchase shares, other events like distributing shares to benefit plans and exercising executive options may still occur. Then, we assume that firms can repurchase shares at the average monthly closing prices.[29] Then, we calculate *CRSP Repurchases* by multiplying the aggregated number of CRSP share decreases with the average monthly closing price, scaled by total book assets. Stephens and Weisbach (1998) posit that because firms may repurchase and distribute shares in the same month, the monthly changes in repurchases reflect the aggregation of these activities. Thus, *CRSP repurchases* potentially understate the true value of repurchases. Nevertheless, the deviation between CRSP and Compustat repurchase measures is reported to be non-significant (Jagannathan et al., 2000).

Last, as a part of the baseline analysis, we construct a variable identifying whether a firm initiates a repurchase programme. Skinner (2008) find that firms regularly repurchase shares every two years. This finding is consistent with Stephens and Weisbach (1998), who find that more than half of repurchasers buy back the targeted number of shares (as specified in the repurchase announcements) within three years. Relying on this evidence, if a firm does not have share repurchases in the last two years, this firm likely does not have any repurchase programs in this period. In addition, if the firm has shares repurchased in the following year, we can consider that this firm initiates a new repurchase programme. We construct a variable *Repurchase initiation* that is an indicator that equals one if a firm does not repurchase in the last two years and then initiates a repurchase programme, and zero otherwise. Following Bliss et al. (2015), we consider

[28] Jagannathan et al. (2000) and Stephens and Weisbach (1998) argue that Compustat repurchases overstate the actual repurchases because this variable includes all securities repurchases and retirements in a given period and sometimes double counts repurchases.
[29] Our result remains the same if we alternatively assume that firms can repurchase shares at the minimum monthly closing prices in a fiscal year.

that a firm does not repurchase shares if the value of repurchases is less than one percent of the previous year's market capitalisation of the firm.

3.3.2.3. Empirical specification

To establish the relationship between the adoption of CSR contracting and share repurchases, we regress *Repurchases* and *Repurchase initiation* on measures of CSR contracting and other control variables in the baseline analyses. As described above, we examine the impact of CSR contracting on the value of repurchases and the likelihood of repurchase initiation. Thus, we use the fixed effects regression model (1) for *Repurchases* and the logistic regression model (2) for *Repurchase initiation*. The selection of logistic regression for our analyses is predicated upon the nature of the dependent variable, *Repurchase initiation*, which serves as an indicator capturing a firm's repurchase policy choice. Logistic regression facilitates the direct estimation of the probability of repurchase events, conditioned on firm-level attributes. When the estimated probability of share repurchases approaches one (zero), it signifies a higher (lower) likelihood of the firm distributing surplus cash to shareholders through share repurchases. Consequently, logistic regression is considered more appropriate than fixed effects regression for modeling binary data, affording greater suitability and interpretability for this analytical context. The empirical specifications (1) and (2) are as follows.

$$Repurchases_{i,t} = \beta \times CSR\ contracting_{i,t-1} + \gamma X_{i,t-1} + Firm_i + Year_t + \epsilon_{i,t} \quad (1)$$

$$\log \frac{\pi_{i,t}}{1-\pi_{i,t}} = \beta \times CSR\ contracting_{i,t-1} + \gamma X_{i,t-1} + Industry_i + Year_t + \epsilon_{i,t} \quad (2)$$

Where *Repurchases* is the value of repurchases scaled by total book assets. π is the probability that a firm would initiate a share repurchase programme. *CSR contracting* includes *CSR contracting* variable and *% CSR contracting* variable. X is a vector of control variables in the previous year. $Firm_i$, $Industry_i$, and $Year_t$ are firm, Fama-French 12-industry, and year fixed effects, respectively. The inclusion of control variables and fixed effects in the baseline model is to reduce the possible estimation bias caused by omitted factors (including time-variant and time-invariant factors) that correlate with measures of repurchases and CSR contracting. In addition,

because firm-year observations of a specific firm may correlate with each other, we cluster all standard errors at the firm level.

We control for various firm-specific characteristics that may influence the firm's repurchase decisions. Specifically, *Size* is the natural logarithm of total book assets. *Ln(Firm age)* is the natural logarithm of firm age, where firm age is the number of data years a firm has in the Compustat database. *ROA* is net come scaled by total book assets. *Cash/TA* is the cash holdings scaled by total book assets. *Market leverage* is the sum of debts in current liabilities and long-term debts, scaled by the market value of assets. *(R&D + CAPEX)* is the sum of R&D expenses and capital expenditures, scaled by total book assets. *Earnings volatility* is the 5-year standard deviation of income before extraordinary items scaled by total book assets. *Market-to-book* is the market value of equity divided by the book value of equity. By controlling for these factors, we reduce the possibility that omitted factors drive our empirical findings. Definitions of all dependent and independent variables are provided in the Appendix.

3.3.3. Descriptive statistics

Panel A of Table 3.1 provides summary statistics for variables in our baseline analysis. Overall, on average, firms in our sample spend 858.7 million dollars for repurchases each year, measured by the Compustat database. This amount is equivalent to 4% of total book assets, which is significant. If we estimate the repurchase value using CRSP data, the average share repurchase value is 754.7 million dollars. The dollar value of *CRSP repurchases* is close yet smaller than that of *Repurchases*. This result is consistent with Stephens and Weisbach (1998) and Jagannathan et al. (2000), that *Compustat repurchases* overstates and *CRSP repurchases* understates the actual value of repurchases. Meanwhile, the average *Treasury repurchases* value is 658.6 million dollars, which is significantly smaller than other measures. In addition, the average rate of *Repurchase initiations* is 8.7%, meaning there are 8.7 repurchase initiations per 100 firm-year observations.

To better understand the difference between two groups of firms with and without CSR contracting, we provide the statistics, including means and standard deviations, of two

corresponding subsets of data. In 27.2% (i.e., 2149 observations) of our sample data, firms link CEO compensation to CSR performance criteria. The average *% CSR contracting* is 3.2%, which is comparable to those reported in Flammer et al. (2019) and Qin and Yang (2022).

It is notable from Panel A that firms with CSR contracting repurchase more than firms without CSR contracting when we consider all three measures of repurchases. For example, the dollar value of *Compustat repurchases* of firms with CSR contracting is 1.076 billion dollars, on average, and significantly larger than the figure of 777.36 million dollars of firms without CSR contracting. Interestingly, when repurchases are scaled by total book assets (i.e., *Repurchases*), it turns out that firms with CSR contracting only spend 3.1% of the total assets for repurchases, while firms without CSR contracting spend significantly more at 4.4%. Similarly, firms with CSR contracting are statistically less likely to initiate repurchases, since the rate of repurchase initiation is 6.7%, which is significantly lower than the full-sample average and much lower than the figure (9.5%) of the group of firms without CSR contracting. These statistics lend some initial support to our hypothesis that repurchasers having CSR contracting tend to repurchase less.

As for other firm characteristics, firms adopting CSR contracting have larger total assets (61.94 billion dollars versus 50 billion dollars), are older (43.76 years versus 34.35 years), are less profitable (*ROA* of 0.051 versus 0.062), hold less cash (*Cash/TA* of 0.093 versus 0.139), have a higher leverage ratio (0.194 versus 0.148), exhibit similar investment levels (0.064 versus 0.063), higher earnings volatility (0.021 versus 0.017), and fewer investment opportunities (market-to-book ratio of 3.423 versus 3.844).

Additionally, Panel B of Table 3.1 reports the pairwise correlation coefficients between the variables used in our baseline analysis. The reported correlation coefficients are relatively small, all below 0.5, indicating no significant concern for multicollinearity.

Figure 3.1 provides insights into the changes in firms' repurchases before and after the first-time adoption of CSR contracting. Specifically, the analysis covers three years before and after the first year of CSR contracting adoption (i.e., Year *t*). The y-axis of the graph represents the value of repurchase reduction, which is calculated as the difference between repurchases in the previous

year and repurchases in the current year, scaled by total assets. If repurchase reduction is negative, firms are increasing repurchases. Conversely, if repurchase reduction is positive, firms are decreasing repurchases. Notably, Figure 3.1 shows that firms with and without CSR contracting experience similar trends in repurchase reduction from year *t-3* to year *t*. The negative value of repurchase reduction indicates that both groups of firms increase share repurchases annually before year *t*. Nevertheless, these trends diverge significantly after year *t*, when one group of firms begins linking CEO compensation to CSR criteria. Specifically, from year *t+1* to year *t+2*, firms adopting CSR contracting continue observing an upward trend (approaching zero) in repurchases, suggesting a deceleration in share repurchases. In contrast, firms not adopting CSR contracting

Table 3.1. Summary statistics

This table provides summary statistics for variables included in the baseline regression. The data sample consists of S&P 500 firms from 2000 to 2018. Panel A provides basic statistics, including means and standard deviations, of measures of share repurchases, CSR contracting, and control variables for the entire sample and two sub-samples of firms without and with CSR contracting (i.e., *CSR contracting* = 0 and *CSR contracting* = 1). Except for *Repurchases ($)*, *CRSP Repurchases*, *Treasury Repurchases*, *Repurchases/TA*, and *Repurchase initiation*, all other variables' one-year lagged statistics are reported to be consistent with the baseline specification in Section 3.3.2.3. We compare summary statistics between two sub-samples by taking the difference between values and providing corresponding t-statistics. Panel B reports Pearson correlation coefficients between variables. All variables are defined in the "Definitions of Variables" section.

Panel A. Summary statistics

	Full Sample (1)		**CSR contracting = 1 (2)**		**CSR contracting = 0 (3)**		**Difference**	**t value**
	N = 7901		**N = 2149**		**N = 5752**		**(3) – (2)**	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.		
Repurchases ($)	858.728	1654.387	1076.503	1955.764	777.365	1518.8	-299.137	-7.15***
CRSP Repurchases ($)	754.765	1707.098	933.011	1885.861	689.338	1631.89	-243.673	-5.6***
Treasury Repurchases ($)	658.63	1394.099	856.382	1667.571	584.624	1269.05	-271.757	-7.75***
Repurchases/AT	0.04	0.059	0.031	0.047	0.044	0.062	0.013	8.45***
Repurchase initiation	0.087	0.282	0.067	0.25	0.095	0.293	0.028	3.9***
% CSR contracting $_{t-1}$	0.003	0.013	0.032	0.028	0	0	-0.032	-86.1***
Total assets$_{t-1}$	53282.42	180177.86	61939.419	187655.72	50048.085	177211.42	-11891.333	-2.6***
Size $_{t-1}$	9.63	1.356	10.045	1.187	9.474	1.382	-0.571	-16.95***
Firm age $_{t-1}$	36.912	18.846	43.766	18.596	34.352	18.292	-9.415	-20.25***
Ln(Firm age $_{t-1}$)	3.429	0.665	3.64	0.604	3.35	0.67	-0.29	-17.6***
ROA $_{t-1}$	0.059	0.068	0.051	0.065	0.062	0.068	0.011	6.5***
Cash/AT $_{t-1}$	0.126	0.136	0.093	0.108	0.139	0.144	0.046	13.5***
Mkt. Leverage $_{t-1}$	0.161	0.127	0.194	0.121	0.148	0.127	-0.045	-14.35***
(R&D + CAPEX) $_{t-1}$	0.063	0.056	0.064	0.051	0.063	0.058	-0.002	-1

(continues)

(continued)

Variable	Full Sample (1) N = 7901		CSR contracting = 1 (2) N = 2149		CSR contracting = 0 (3) N = 5752		Difference (3) – (2)	t value
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.		
Cash flow volatility $_{t-1}$	0.018	0.028	0.021	0.031	0.017	0.027	-0.004	-4.75***
Market-to-book $_{t-1}$	3.729	5.346	3.423	5.321	3.844	5.352	0.42	3.1***

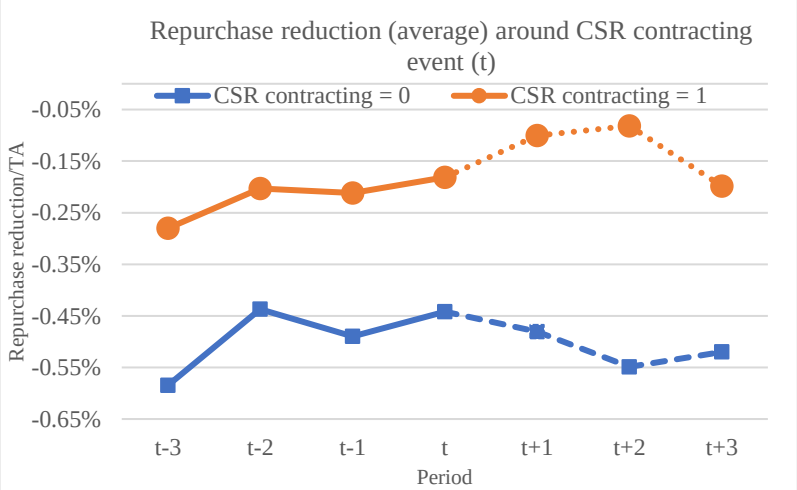
Panel B. Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Repurchases$_{t-1}$	1										
(2) CSR contracting $_{t-1}$	-0.079	1									
(3) % CSR contracting $_{t-1}$	-0.058	0.706	1								
(4) Size $_{t-1}$	-0.213	0.204	0.131	1							
(5) Ln(Firm age $_{t-1}$)	-0.098	0.182	0.071	0.187	1						
(6) ROA $_{t-1}$	0.453	-0.064	-0.049	-0.235	-0.012	1					
(7) Cash/TA $_{t-1}$	0.334	-0.109	-0.054	-0.171	-0.243	0.232	1				
(8) Mkt. Leverage $_{t-1}$	-0.341	0.151	0.149	0.245	0.129	-0.398	-0.372	1			
(9) (R&D + CAPEX) $_{t-1}$	0.131	-0.03	-0.024	-0.322	-0.066	0.138	0.233	-0.212	1		
(10) Cash flow volatility $_{t-1}$	0.04	0.044	0.012	-0.132	0.282	-0.069	0.119	-0.02	0.216	1	
(11) Market-to-book $_{t-1}$	0.222	-0.037	-0.037	-0.135	-0.038	0.264	0.135	-0.191	0.134	0.027	1

appear to increase share repurchases, as depicted by the downward movement of the blue line. In year *t+3*, the trends start to converge, possibly because the impact of CSR contracting weakens. Consistent with the statistics presented in Panel A of Table 3.1, Figure 3.1 exhibits a potential moderating impact of CSR contracting on repurchase decisions.

Figure 3.1. CSR contracting event and repurchase changes

This figure displays the fluctuation of repurchase changes for a 7-year period surrounding the first-time adoption of CSR contracting. The sample consists of firm-year observations three years before and three years after the introduction of CSR contracting in year *t*. The y-axis represents the difference between repurchases in the previous year and repurchases in the subsequent year, scaled by total book assets. We denote this variable as *Repurchase reduction/TA*. A negative value of *Repurchase reduction/TA* indicates an increase in repurchases, while a positive value suggests a decrease in repurchases by the firm.



3.4. CSR contracting and share repurchases

3.4.1. Baseline results

In this section, we formally test the relationship between CSR contracting and share repurchases. Accordingly, we focus on the ex-post repurchases and the probability of repurchase initiation when firms adopt CSR contracting ex-ante. Table 3.2 reports our baseline results. In Panel A of Table 3.2, we regress *Repurchases* on measures of CSR contracting, controlling for various firm characteristics and fixed effects. Column 1 reports the regression results of equation (1) using *CSR contracting* as the main regressor. Column 2 reports the regression results of equation (1) using *% CSR contracting* as the main regressor. We consistently find that the coefficients of CSR contracting measures are negative and significant at the 5% level. In addition, the results show

that the impact of CSR contracting on repurchases is economically significant. In particular, the coefficient of *CSR contracting* is -0.004, meaning that the presence of CSR contracting provisions reduces *Repurchases* by 0.004. Given that the mean of total book assets of firms with CSR contracting is 61.94 billion dollars, the impact is equivalent to a decrease of 247.76 million dollars. In addition, the coefficient of *% CSR contracting* is -0.114, meaning that a one percent increase in CSR-based compensation over total CEO compensation would reduce repurchases by 70.61 million dollars.

Panel B of Table 3.2 presents the logistic regression results of *Repurchase initiation* on CSR contracting measures. Column 1 reports the regression results of equation (2) using *CSR contracting* as the main regressor. Column 2 reports the regression results of equation (2) using *% CSR contracting* as the main regressor. We find that the coefficient of *CSR contracting* is negatively significant at the 1% level. The coefficient of *% CSR contracting* is also negative but not significant. The results suggest that the presence of CSR contracting statistically reduces firms' likelihood of repurchase initiation. The economic significance of the impact cannot be overlooked. Ceteris paribus, the introduction of CSR contracting reduces the probability of repurchase initiation by 1.57%.

The signs of other firm characteristics are generally consistent with the literature. For example, larger and older firms tend to repurchase more, since matured firms tend to have smaller sets of investment opportunities (Grullon and Michaely, 2004). Firms with higher earnings and large cash reserves are more likely to repurchase shares, consistent with the free cash flow motive of repurchases (Jensen, 1986; Skinner, 2008). In addition, firms with high financing costs (high market leverage) and high investments (high R&D and capital expenditures) tend to repurchase less and are less likely to initiate repurchase programs. Collectively, the baseline results support our main hypothesis that CEOs with CSR-based compensation tend to reduce share repurchases and are less likely to initiate repurchase programs.

Table 3.2. Baseline regression results

This table examines whether CSR contracting affects the level of share repurchases and the likelihood of repurchase initiation. Panel A presents the results of fixed effects regressions using *Repurchases* as the dependent variable. *Repurchases* is the value of Compustat repurchases scaled by total book assets. Panel B presents the result of logistic

regressions where *Repurchase initiation* is the main dependent variable. *Repurchase initiation* is an indicator that equals one if a firm does not repurchase in the last two years and then initiates a repurchase programme. In both panels, the main explanatory variables are *CSR contracting* (Column 1) and *% CSR contracting* (Column 2). *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. The regressions include firm, industry, and year-fixed effects. Industry fixed effects follow the Fama-French 12 industry classification. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of Variables" section.

Panel A. CSR contracting and share repurchases

	Dependent: *Repurchases*	
Variables	(1)	(2)
CSR contracting$_{t-1}$	-0.004**	
	(-2.466)	
% CSR contracting $_{t-1}$		-0.114**
		(-2.000)
Size $_{t-1}$	0.003	0.006
	(0.956)	(1.552)
Ln(Firm age) $_{t-1}$	0.001	-0.004
	(0.092)	(-0.474)
ROA $_{t-1}$	0.125***	0.132***
	(7.418)	(6.777)
Cash/TA $_{t-1}$	0.053***	0.054***
	(3.107)	(2.823)
Mkt. Leverage $_{t-1}$	-0.102***	-0.106***
	(-7.661)	(-6.784)
(R&D + CAPEX) $_{t-1}$	-0.066*	-0.053
	(-1.774)	(-1.223)
Earnings volatility $_{t-1}$	0.077*	0.080
	(1.849)	(1.532)
Market-to-book $_{t-1}$	0.001***	0.001***
	(4.062)	(3.224)
N	7,901	6,417
Adj. R-squared	0.138	0.142
Firm FE	Yes	Yes
Year FE	Yes	Yes

Panel B. CSR contracting and repurchase initiation

	Dependent: Repurchase initiation	
Variables	(1)	(2)
CSR contracting$_{t-1}$	-0.292***	
	(-2.775)	
% CSR contracting $_{t-1}$		-3.896
		(-1.077)
Size $_{t-1}$	-0.052	-0.022
	(-1.588)	(-0.614)
Ln(Firm age) $_{t-1}$	-0.605***	-0.609***
	(-11.578)	(-10.253)
ROA $_{t-1}$	1.069	1.315*
	(1.597)	(1.825)
Cash/TA $_{t-1}$	-0.094	-0.071
	(-0.288)	(-0.210)
Mkt. Leverage $_{t-1}$	-0.061	-0.064
	(-0.199)	(-0.190)
(R&D + CAPEX) $_{t-1}$	-3.097***	-2.760***
	(-3.456)	(-2.825)
Earnings volatility $_{t-1}$	6.192***	6.886***
	(5.277)	(5.301)
Market-to-book $_{t-1}$	-0.012*	-0.012*
	(-1.852)	(-1.739)
N	7,901	6,417
Pseudo R-squared	0.0455	0.0393
Industry FE	Yes	Yes
Year FE	Yes	Yes

3.4.2. Robustness checks

In this section, we implement a series of robustness checks to enhance the reliability of our baseline findings. In the first robustness test, we re-examine the relationship between CSR contracting and repurchases, using alternative measures constructed differently from other databases. We present the results in Panel A of Table 3.3. As discussed in Section 3.2.2, we include several alternative measures of repurchases. First, we scale Compustat repurchases using firm sales, instead of total book assets (Columns 1 and 2). The substitution of total assets with firm sales serves a dual purpose. First, while *Repurchases/Total assets* quantifies the proportion of a firm's total assets allocated to share repurchases, *Repurchases/Sales* signifies the fraction of firm

sales directed towards shareholders via repurchases. Consequently, this metric allows for the assessment of the firm's share repurchase aggressiveness from an income statement perspective, thereby facilitating a more comprehensive understanding of the impact of CSR contracting on the firm's payout policy. Second, the adoption of *Repurchases/Sales* addresses concerns related to data availability and quality. Total assets data may be subject to recording inaccuracies and may contain missing values, potentially compromising result accuracy. Therefore, the adoption of two alternative measures of share repurchases derived from the Compustat database mitigates the risk of measurement errors and enhances the robustness of our findings.

Next, we use *CRSP Repurchases,* which measure the aggregated monthly decrease in the number of shares outstanding reported in the CRSP database, scaled by total book assets (Stephens and Weisbach, 1998) (Columns 3 and 4). Lastly, we use *Treasury Repurchases*, which measures the common treasury stock increase, scaled by total book assets (Skinner, 2008) (Columns 5 and 6). For each alternative measure of repurchases, we regress repurchases on two measures of CSR contracting, which are *CSR contracting* and *% CSR contracting*. Panel A of Table 3.3 demonstrates that the effect of CSR contracting on repurchases remains negative and significant, thus alleviating the concern that our baseline results are sensitive to the choice of share repurchase measures.

Existing literature has also highlighted the importance of executives' stock and option compensation in explaining repurchase decisions (Fenn and Liang, 2001; Kahle, 2002). To ensure that our findings are not biased by omitting these factors, following Kahle (2002) and Fenn and Liang (2001), we regress *Repurchases* on measures of CSR contracting following the baseline specification. We additionally control for CEOs' option compensation scaled by total shares outstanding (i.e., *Option ownership*) and stock compensation scaled by total shares outstanding (i.e., *Stock ownership*). Panel B of Table 3.3 reports the results, showing that our baseline results remain significant after accounting for these additional variables. In an additional analysis reported in Columns 3 and 4 of Panel B, we find that the adverse effect of *CSR contracting* on the probability of *Repurchase initiation* remains statistically significant when we account for CEOs' stock and option incentives.

Besides, it is important to examine the potential influence of the observation window on our findings. There is empirical evidence that firms reduce repurchases during periods of financing shocks, such as the shock due to the global financial crisis from 2007 to 2009. This financial crisis also induced a reform of the executive compensation structure that may further confound the true impact of CSR contracting. It is possible that the adverse impact of CSR contracting on repurchases is purely due to the crisis event, and there might be no significant relationship, or even a reversed relationship, during other periods. To test this possibility, we remove firm-year observations from 2007 to 2009 and re-estimate equation (1). Panel C of Table 3.3 shows that the coefficients of *CSR contracting* (Column 1) and *% CSR contracting* (Column 2) are negative and significant at the 5% level if we use *Repurchases* as the dependent variable.[30] In an additional analysis reported in Columns 3 and 4 of Panel C, we find that the adverse effect of *CSR contracting* on the probability of *Repurchase initiation* remains statistically significant when we remove firm-year observations from 2007 to 2009.

In the last robustness check, to address the concern that our results may be influenced by unobserved factors coinciding with the use of CSR contracting, we implement a falsification test. The rationale behind this test is as follows: If we randomly assign CSR contracting values to observations that originally adopt CSR contracting differently, and the coefficients of CSR contracting remain negatively significant, it indicates the influence of unobserved factors on our baseline results. To implement the falsification test, we construct two pseudo variables. The first variable, *Pseudo CSR contracting*, is constructed by randomly assigning 2149 observations with CSR contracting values equal to 1, while the remaining observations are assigned CSR contracting values of 0. The second variable, *Pseudo % CSR contracting*, is constructed by reallocating the initial *% CSR contracting* values between observations of a group of firms having CSR contracting. Let us consider a simple example. Both firm A and firm B adopt CSR contracting. Initially, Firm A has a *% CSR contracting* value of 10%, and Firm B has a *% CSR contracting* value of 1%. After the reallocation, Firm A would have a *Pseudo % CSR contracting*

[30] The results remain negatively significant if we use *CRSP Repurchases* and *Treasury Repurchases* as dependent variables.

value of 1%, while Firm B would have a *Pseudo % CSR contracting* value of 10%. Observations belonging to a group of firms without CSR contracting are assigned a *Pseudo % CSR contracting* value of 0. All missing values are excluded from this analysis.

Panel D of Table 3.3 reports the results of the falsification test. Accordingly, the coefficients of *Pseudo CSR contracting* and *Pseudo % CSR contracting* are insignificant, lending support to the notion that our baseline results are not driven by unobserved factors that coincide with the adoption of CSR contracting. Consistently, in an additional analysis reported in Columns 3 and 4 of Panel D, we find that the adverse effect of *Pseudo CSR contracting* on the probability of *Repurchase initiation* is insignificant. Collectively, the results of different robustness checks solidify our conclusion about the moderating effect of both the presence and the substantiveness of CSR contracting on repurchase decisions.

Table 3.3. Robustness checks

This table reports the results of robustness checks of the relationship between CSR contracting and repurchases. Panel A presents the fixed effects regression results using alternative measures of repurchases. Panel B presents the regressions controlling for CEOs' stock and option ownership. Panel C presents the regression results when removing observations relating to the 2007-2009 financial crisis. Panel D presents the regression results of the falsification test. We use fixed effects regressions for measures of repurchases, as discussed in Section 3.2.2. We use logistic regressions for *Repurchase initiation*, which is an indicator that equals one if a firm has not repurchased in the last two years and then initiates a repurchase programme. The main explanatory variables are *CSR contracting* and *% CSR contracting. CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. The same control variables and fixed effects as in the baseline regression (Table 3.2) are included. Industry fixed effects follow the Fama-French 12 industry classification. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of Variables" section.

Panel A. Alternative measures of share repurchases

	Repurchases/Sales		CRSP Repurchases		Treasury Repurchases	
Variables	(1)	(2)	(3)	(4)	(5)	(6)
CSR contracting$_{t-1}$	-0.006**		-0.006**		-0.003*	
	(-2.103)		(-2.367)		(-1.785)	
% CSR contracting $_{t-1}$		-0.192*		-0.178***		-0.096
		(-1.752)		(-2.619)		(-1.647)
Size $_{t-1}$	0.007	0.011*	-0.001	0.000	0.005	0.008**

(continues)

(continued)

	Repurchases/Sales		CRSP Repurchases		Treasury Repurchases	
Variables	(1)	(2)	(3)	(4)	(5)	(6)
	(1.494)	(1.820)	(-0.419)	(0.112)	(1.647)	(2.240)
Ln(Firm age) $_{t-1}$	0.004	0.000	0.005	0.002	-0.001	-0.007
	(0.402)	(0.026)	(0.481)	(0.201)	(-0.216)	(-1.000)
ROA $_{t-1}$	0.124***	0.132***	0.113***	0.121***	0.107***	0.105***
	(4.912)	(4.642)	(5.019)	(5.139)	(6.467)	(5.559)
Cash/TA $_{t-1}$	0.080***	0.078***	0.051***	0.053**	0.044***	0.043**
	(3.331)	(2.867)	(2.595)	(2.422)	(2.682)	(2.401)
Mkt. Leverage $_{t-1}$	-0.155***	-0.158***	-0.069***	-0.075***	-0.080***	-0.085***
	(-6.383)	(-5.513)	(-4.446)	(-4.452)	(-6.647)	(-6.081)
(R&D + CAPEX) $_{t-1}$	-0.166***	-0.156**	-0.103**	-0.106**	-0.039	-0.033
	(-3.093)	(-2.453)	(-2.266)	(-1.981)	(-1.164)	(-0.837)
Earnings volatility $_{t-1}$	0.042	0.005	0.015	-0.036	0.039	0.036
	(0.620)	(0.066)	(0.333)	(-0.623)	(0.998)	(0.758)
Market-to-book $_{t-1}$	0.001***	0.001**	0.001**	0.001**	0.001**	0.001***
	(2.910)	(2.251)	(2.561)	(2.524)	(3.717)	(2.961)
N	7,899	6,415	8,044	6,559	8,031	6,533
Adj. R-squared	0.100	0.101	0.063	0.069	0.110	0.113
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. Controlling for CEO's option and stock ownership

	Dependent: *Repurchases*		*Dependent*: *Repurchase initiation*	
Variables	(1)	(2)	(3)	(4)
CSR contracting$_{t-1}$	-0.005**		-0.278***	
	(-2.480)		(-2.603)	
% CSR contracting $_{t-1}$		-0.107*		-3.963
		(-1.859)		(-1.104)
Size $_{t-1}$	0.003	0.006	-0.068**	-0.041
	(0.829)	(1.493)	(-2.017)	(-1.117)
Ln(Firm age) $_{t-1}$	-0.002	-0.006	-0.595***	-0.600***
	(-0.236)	(-0.824)	(-11.183)	(-9.862)
ROA $_{t-1}$	0.134***	0.142***	1.010	1.216*
	(7.857)	(7.243)	(1.496)	(1.675)
Cash/TA $_{t-1}$	0.050***	0.049**	-0.123	-0.087
	(2.761)	(2.469)	(-0.377)	(-0.255)
Mkt. Leverage $_{t-1}$	-0.099***	-0.104***	-0.023	-0.016

(continues)

(continued)

Variables	*Dependent*: *Repurchases*		*Dependent*: *Repurchase initiation*	
	(1)	(2)	(3)	(4)
	(-7.442)	(-6.645)	(-0.072)	(-0.046)
(R&D + CAPEX) $_{t-1}$	-0.061	-0.050	-3.153***	-2.809***
	(-1.589)	(-1.121)	(-3.483)	(-2.824)
Earnings volatility $_{t-1}$	0.075*	0.079	6.251***	6.871***
	(1.796)	(1.517)	(5.285)	(5.224)
Market-to-book $_{t-1}$	0.001***	0.001***	-0.012*	-0.012*
	(3.701)	(3.052)	(-1.862)	(-1.738)
Stock ownership $_{t-1}$	-0.048	-0.057	0.711	-0.173
	(-1.048)	(-1.397)	(0.486)	(-0.111)
Option ownership $_{t-1}$	-0.190	-0.019	-26.811	-36.665**
	(-0.590)	(-0.051)	(-1.640)	(-2.031)
N	7,770	6,309	7,770	6,309
Adj. R-squared	0.139	0.143		
Pseudo R-squared			0.0456	0.0397
Firm FE	Yes	Yes	No	No
Industry FE	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Panel C. Removing observations associated with the 2007-2009 global financial crisis

Variables	*Dependent*: *Repurchases*		*Dependent*: *Repurchase initiation*	
	(1)	(2)	(3)	(4)
CSR contracting$_{t-1}$	-0.004**		-0.333***	
	(-2.25)		(-3.009)	
% CSR contracting $_{t-1}$		-0.113*		-6.220
		(-1.92)		(-1.389)
Size $_{t-1}$	0.003	0.006	-0.028	0.006
	(0.84)	(1.43)	(-0.796)	(0.154)
Ln(Firm age) $_{t-1}$	0.000	-0.005	-0.530***	-0.546***
	(0.00)	(-0.53)	(-8.700)	(-8.216)
ROA $_{t-1}$	0.133***	0.144***	1.098	1.324*
	(6.80)	(6.21)	(1.484)	(1.678)
Cash/TA $_{t-1}$	0.054***	0.049**	-0.144	-0.139
	(2.91)	(2.34)	(-0.419)	(-0.390)
Mkt. Leverage $_{t-1}$	-0.102***	-0.104***	0.001	-0.032
	(-7.18)	(-6.18)	(0.002)	(-0.090)
(R&D + CAPEX) $_{t-1}$	-0.070*	-0.059	-2.568***	-2.152**

(continues)

(continued)

	Dependent: *Repurchases*		*Dependent*: *Repurchase initiation*	
Variables	(1)	(2)	(3)	(4)
	(-1.70)	(-1.20)	(-2.676)	(-2.050)
Earnings volatility $_{t-1}$	0.067	0.075	6.601***	7.187***
	(1.49)	(1.34)	(5.311)	(5.172)
Market-to-book $_{t-1}$	0.001***	0.001***	-0.011*	-0.011
	(3.51)	(3.34)	(-1.649)	(-1.562)
N	6,664	5,415	6,664	5,415
Adj. R-squared	0.11	0.11		
Pseudo R-squared			0.0371	0.0316
Firm FE	Yes	Yes	No	No
Industry FE	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Panel D. Falsification test

	Dependent: *Repurchases*		*Dependent*: *Repurchase initiation*	
Variables	(1)	(2)	(3)	(4)
Pseudo CSR contracting $_{t-1}$	-0.001		0.034	
	(-0.50)		(0.38)	
Pseudo % CSR contracting $_{t-1}$		-0.010		-5.071
		(-0.23)		(-1.40)
Size $_{t-1}$	0.003	0.006	-0.069**	-0.022
	(0.97)	(1.55)	(-2.02)	(-0.58)
Ln(Firm age) $_{t-1}$	0.001	-0.003	-0.661***	-0.684***
	(0.13)	(-0.46)	(-12.42)	(-10.74)
ROA $_{t-1}$	0.125***	0.132***	0.940	1.092
	(7.41)	(6.77)	(1.38)	(1.44)
Cash/TA $_{t-1}$	0.054***	0.054***	0.114	0.179
	(3.13)	(2.83)	(0.33)	(0.49)
Mkt. Leverage $_{t-1}$	-0.102***	-0.106***	-0.564	-0.696*
	(-7.65)	(-6.76)	(-1.62)	(-1.80)
(R&D + CAPEX) $_{t-1}$	-0.067*	-0.054	-3.450***	-3.007***
	(-1.79)	(-1.23)	(-3.54)	(-2.81)
Earnings volatility $_{t-1}$	0.073*	0.079	6.155***	7.531***
	(1.72)	(1.49)	(5.09)	(5.65)
Market-to-book $_{t-1}$	0.001***	0.001***	-0.010	-0.010
	(4.05)	(3.23)	(-1.55)	(-1.39)

(continues)

(continued)

	Dependent: *Repurchases*		*Dependent*: *Repurchase initiation*	
Variables	(1)	(2)	(3)	(4)
N	7,901	6,417	7,901	6,417
Adj. R-squared	0.14	0.14		
Pseudo R2			0.0519	0.0493
Firm FE	Yes	Yes	No	No
Industry FE	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

3.4.3. Cross-sectional heterogeneity tests

Our main interpretation of the impact of CSR contracting on repurchases is that incentivised CEOs would pay more attention to stakeholders' interests. As stakeholders benefit from firms' stable performance, incentivised CEOs should prioritise funding and maintaining long-term projects, including CSR investments. As a result, retaining internal capital and debt capacity becomes a preferred strategy over distributing excess cash to shareholders through share repurchases. If this argument is valid, it leads to two related predictions that have yet to be tested. Accordingly, preserving financial resources to secure stakeholder-oriented investments would be more critical if firms have more volatile cash flow and high investment opportunities. By examining these potential sources of cross-sectional heterogeneity in the effect of CSR contracting, we enhance the credibility of our stakeholder-based interpretation and strengthen our baseline findings.

The first source of cross-sectional heterogeneity may arise due to firms' earnings volatility. Stakeholders are highly susceptible to financial constraints, which deteriorate firms' abilities to protect stakeholders' interests (e.g., Cohn and Wardlaw, 2016; Xu and Kim, 2022). In this context, high cash flow uncertainty is harmful to stakeholders, since it heightens the risk of financial constraints and may contribute to funding shortfalls that induce firms to renege on stakeholders' claims. Moreover, external financing is more expensive than internal financing for firms with high cash flow volatility. Thus, these firms would rely more on internal cash than on debts and equity

issuance, leading to the adoption of a more prudent payout policy. (Brav et al., 2005; Chay and Suh, 2009). For CEOs with CSR contracting, maintaining sufficient funds to protect CSR investments becomes more crucial. Therefore, we predict that the impact of CSR contracting on repurchase reduction would be stronger for firms having volatile cash flow.

Following Chay and Suh (2009) and John et al. (2011), we define *Cash flow volatility* as the 5-year standard deviation of operating income before depreciation minus total interest and related expenses minus total income taxes, scaled by total book assets. Then, we construct *High cash flow volatility* as an indicator variable that equals one if a firm has *Cash flow volatility* that is larger than the sample median, and zero otherwise. Panel A of Table 3.4 reports the regression results using *High cash flow volatility* and other control variables as in the baseline specification. The dependent variable is *Repurchases.* We use *CSR contracting* (Column 1) and *% CSR contracting* (Column 2) as the main regressors. In this analysis, we focus on the interaction terms between measures of CSR contracting and *High cash flow volatility*. Consistent with our prediction, the coefficients of the interaction terms are negative and significant across all regressions. This result lends support to the notion that incentivised CEOs are more responsive in reducing repurchases when faced with significant threats imposed on stakeholders' claims.

Second, the moderating impact of CSR contracting on repurchase decisions may vary in the cross-section due to the availability of investment opportunities. Modigliani and Miller (1958) posit that firms will always prioritise investment decisions and will payout any residual cash flows. This argument implies that repurchases should be treated as a way to distribute residual cash flows to shareholders after investment decisions are made. This view is consistent with most managers' responses in a survey study by Brav et al. (2005) that the availability of investment opportunities is one important determinant of repurchase decisions. In line with this perspective, when presented with more profitable investment options, incentivised CEOs should be more inclined to preserve funds for these investments before considering the distribution of residual cash through repurchase programs.

Following previous studies, we measure investment opportunities by Tobin's Q, which is calculated as the sum of market equity and total liabilities, divided by total book assets. Then, we

construct an indicator variable *High Tobin's Q*, which equals one if a firm's Tobin's Q is higher than the median value of the sample's Tobin's Q. Panel B of Table 3.4 shows the regression results of *Repurchases* on CSR contracting measures, controlling for *High Tobin's Q* and other control variables as in the baseline specification. We use *CSR contracting* (Column 1) and *% CSR contracting* (Column 2) as the main regressors. Our main interests are the coefficients of the interaction terms between CSR contracting measures and *High Tobin's Q*. Consistent with our prediction, the coefficients of the interaction terms are negative and significant across all regressions. This finding supports our interpretation that if there are numerous investment opportunities that have the potential to enhance stakeholder value and sustainable growth of firms, incentivised CEOs are more inclined to prioritise allocating funds towards these opportunities rather than distributing valuable capital through repurchases.

Table 3.4. Cross-sectional heterogeneity analysis

This table presents the relationship between CSR contracting and repurchases, conditional on cash flow volatility and investment opportunities. Panel A presents the fixed effects regressions of *Repurchases* on CSR contracting measures, conditional on cash flow volatility. *High cash flow volatility* is an indicator variable that equals one if a firm has the 5-year standard deviation of operating income scaled by total book assets that is larger than the sample median, and zero otherwise. Panel B presents the fixed effects regressions of *Repurchases* on CSR contracting measures, conditional on *High Tobin's Q. High Tobin's Q* is an indicator variable that equals one if a firm has Tobin's Q that is larger than the sample median, and zero otherwise. In both panels, we use *Repurchases* as the dependent variable. *Repurchases* is the value of Compustat repurchases scaled by total book assets. The main explanatory variables are *CSR contracting* (Column 1) and *% CSR contracting* (Column 2). *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. The same control variables and fixed effects as in the baseline regression (Table 3.2) are included. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of Variables" section.

Panel A. Impact of CSR contracting on repurchases, conditional on 5-year cash flow volatility

	Dependent: Repurchases	
Variables	(1)	(2)
CSR contracting$_{t-1}$	-0.001	
	(-0.694)	
% CSR contracting $_{t-1}$		-0.045
		(-0.882)
Cash flow volatility $_{t-1}$	0.005**	0.003
	(2.456)	(1.613)

(continues)

	Dependent: Repurchases	
Variables	(1)	(2)
CSR contracting$_{t-1}$ x High cash flow volatility $_{t-1}$	-0.005**	
	(-2.017)	
% CSR contracting$_{t-1}$ x High cash flow volatility $_{t-1}$		-0.197**
		(-2.006)
Size $_{t-1}$	0.003	0.006
	(0.606)	(0.993)
Ln(Firm age) $_{t-1}$	-0.018	-0.026*
	(-1.416)	(-1.900)
ROA $_{t-1}$	0.133***	0.146***
	(6.205)	(5.632)
Cash/TA $_{t-1}$	0.075***	0.071***
	(3.251)	(2.811)
Mkt. Leverage $_{t-1}$	-0.131***	-0.139***
	(-7.451)	(-6.297)
(R&D + CAPEX) $_{t-1}$	-0.122***	-0.093*
	(-2.906)	(-1.904)
Earnings volatility $_{t-1}$	0.077	0.102
	(1.517)	(1.574)
Market-to-book $_{t-1}$	0.001***	0.001***
	(3.267)	(2.640)
N	5,678	4,474
Adj. R-squared	0.163	0.168
Firm FE	Yes	Yes
Year FE	Yes	Yes

Panel B. Impact of CSR contracting on repurchases, conditional on investment opportunities

	Dependent: Repurchases	
Variables	(1)	(2)
CSR contracting$_{t-1}$	-0.001	
	(-0.625)	
% CSR contracting $_{t-1}$		-0.019
		(-0.506)
Cash flow volatility $_{t-1}$	0.008***	0.004
	(3.691)	(1.534)
CSR contracting$_{t-1}$ x High Tobin's Q $_{t-1}$	-0.006**	
	(-2.109)	
CSR contracting$_{t-1}$ x High Tobin's Q $_{t-1}$		-0.207*
		(-1.881)
Size $_{t-1}$	0.008**	0.008*
	(2.392)	(1.737)

(continues)

(continued)

	Dependent: Repurchases	
Variables	(1)	(2)
Ln(Firm age) $_{t-1}$	-0.003	-0. 015*
	(-0.432)	(-1.667)
ROA $_{t-1}$	0.137***	0.138***
	(7.500)	(6.435)
Cash/TA $_{t-1}$	0.065***	0.060***
	(3.512)	(2.837)
Mkt. Leverage $_{t-1}$	-0.145***	-0.118***
	(-8.833)	(-6.179)
(R&D + CAPEX) $_{t-1}$	-0.076*	-0.032
	(-1.960)	(-0.713)
Earnings volatility $_{t-1}$	0.088**	0.104*
	(2.050)	(1.936)
Market-to-book $_{t-1}$	0.001***	0.001***
	(3.690)	(2.659)
N	7,038	5,644
Adj. R-squared	0.099	0.149
Firm FE	Yes	Yes
Year FE	Yes	Yes

3.4.4. Alternative explanation

To this point, we have presented substantial evidence indicating that CSR contracting dampens the increase of share repurchases. Specifically, we rely on the stakeholder-based hypothesis that CEOs with CSR-based compensation retain financial resources, by reducing or avoiding repurchases, to reduce the risk of financial constraints and protect stakeholders' interests. Nevertheless, there is an alternative agency-based view that may explain the negative relationship between CSR contracting and share repurchases. In this section, we examine the baseline relationship under this angle. By doing so, we can extend our understanding of CSR contracting and its potential multidirectional impacts on firm policies and outcomes. Moreover, we can strengthen our stakeholder-based interpretation if the alternative explanations are ruled out.

Under the agency-based view, two major issues potentially undermine the expected effects of CSR contracting. First, numerous stakeholders have affiliations with firms and may significantly affect firm outcomes, such as employers, customers, and suppliers. Nevertheless, these

stakeholders may have conflicting interests with each other (Flammer et al., 2019). For example, local communities are interested in how a firm's operations affect local employment and environmental issues, while customers have short-term claims about pricing and after-sales customer services. CSR contracting provisions cannot cover all of these conflicting interests. If firms include as many CSR criteria as possible to satisfy all stakeholders, the problems of the multiplication of tasks arise. Bebchuk and Tallarita (2022) posit that the inclusion of vague, narrow, and multidimensional CSR tasks may render CEOs' efforts ineffective because CEOs may prioritise other performance criteria that are clearly specified and contribute to the common targets. Thus, the commitments of incentivised CEOs to enhance stakeholders' interests are questionable. Second, the lack of disclosed context, measurability and specificity of CSR goals deteriorates the outsiders' reviewability and monitoring (Bebchuk and Tallarita, 2022). In this vein, CSR contracting may exacerbate agency problems by increasing CEOs' personal wealth in exchange for limited firm value created. Incentivised CEOs may spend little effort to achieve unchecked and worthless CSR performance. They may even overinvest in CSR-related projects to buy public support and disguise weak financial performance. Under this agency-based view of CSR contracting, incentivised CEOs may reduce share repurchases and use the proceeds to engage in value-destroying investments.

One implication of the agency-based perspective is that the negative relationship between CSR contracting and share repurchases should be stronger (weaker) if firms have weaker (stronger) governance quality. To test this conjecture, we construct several measures of firms' corporate governance quality. First, following Bebchuk et al. (2009), we construct *E index* that is the sum of six indicators, in which each indicator equals one if a firm has one of the following antitakeover provisions: staggered boards, limits to amend bylaws, supermajority, golden parachutes, and poison pill. The maximum value of *E index* is six, and the minimum value is zero. The higher value of *E index* indicates weaker governance quality and higher managerial entrenchment. Second, we construct *Board independence,* which is the ratio of the number of independent directors to board size. Third, we use the *Takeover index* constructed by Cain et al. (2017), which

measures the takeover susceptibility of firms.[31] A higher value of *Takeover index* indicates that firms have higher legal protection against takeovers, which implies higher levels of managerial entrenchment.

Then, we implement baseline regressions, including measures of governance quality and their interaction terms with measures of CSR contracting. If the agency-based view is valid, the effect of CSR contracting should be sensitive to corporate governance quality, and the coefficients of all interaction terms should be significant. Table 3.5 reports the regression results of this analysis. Accordingly, none of the coefficients of the interaction terms are significant. This finding suggests that the impact of CSR contracting on repurchases does not vary with firms' governance quality, contradicting the agency-based perspective's implications. Consequently, we partially rule out the possibility that CEOs exploit CSR contracting to reduce share repurchases and serve their interests.

3.4.5. Reverse causality explanation

Although we have provided evidence supporting the first hypothesis, it is possible that repurchase decisions may influence firms' propensity to link CEOs' compensation to CSR criteria. For example, firms that reduce repurchases or do not initiate repurchases recently may retain excess cash for profitable investments. As a result, these firms have stronger incentives to adopt CSR contracting, knowing the incentivised CEOs may use the preserved financial resources for stakeholder-oriented spending.

Table 3.5. Examining the agency-based view about the impact of CSR contracting on repurchases

This table reports the results of robustness checks of the relationship between CSR contracting and repurchases, conditional on measures of corporate governance quality. We use *Repurchases* as the dependent variable. *Repurchases* is the value of Compustat repurchases scaled by total book assets. The main explanatory variables are *CSR contracting* and *% CSR contracting*. *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. *E index* is a measure of managerial entrenchment following Bebchuk et al. (2009). *Board independence* is the ratio of the number of independent directors to board size. *Takeover index* is constructed by Cain et al. (2017). The same set of control variables and fixed effects, as in the baseline regression (Table 3.2), are included. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in

[31] The takeover index data is provided by Stephen McKeon and available at https://pages.uoregon.edu/smckeon/

parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of Variables" section.

	Dependent: Repurchases					
Variables	(1)	(2)	(3)	(4)	(5)	(6)
CSR contracting$_{t-1}$	-0.005		0.015		-0.003	
	(-1.005)		(1.222)		(-0.481)	
% CSR contracting $_{t-1}$		-0.108		0.089		-0.016
		(-0.838)		(0.126)		(-0.062)
E index$_{t-1}$	0.001	0.001				
	(0.605)	(0.992)				
CSR contracting$_{t-1}$ x E index $_{t-1}$	-0.000					
	(-0.157)					
%CSR contracting$_{t-1}$ x E index $_{t-1}$		0.006				
		(0.115)				
Board independence$_{t-1}$			0.008	0.010		
			(0.864)	(0.985)		
CSR contracting$_{t-1}$ x Board independence $_{t-1}$			-0.024			
			(-1.636)			
%CSR contracting$_{t-1}$ x Board independence $_{t-1}$				-0.242		
				(-0.300)		
Takeover index$_{t-1}$					-0.015	-0.019
					(-0.585)	(-0.481)
CSR contracting$_{t-1}$ x Takeover index $_{t-1}$					-0.011	
					(-0.461)	
%CSR contracting$_{t-1}$ x Takeover index $_{t-1}$						-1.382
						(-1.293)
Size $_{t-1}$	0.004	0.007	0.002	0.005	0.001	0.004
	(0.923)	(1.443)	(0.445)	(1.043)	(0.312)	(0.821)
Ln(Firm age) $_{t-1}$	0.003	-0.005	0.001	-0.006	0.010	0.006
	(0.270)	(-0.471)	(0.066)	(-0.613)	(0.873)	(0.478)
ROA $_{t-1}$	0.137***	0.145***	0.137***	0.144***	0.107***	0.119***
	(7.401)	(6.765)	(7.587)	(7.103)	(5.208)	(5.166)
Cash/TA $_{t-1}$	0.058***	0.058**	0.058***	0.055**	0.039*	0.039
	(2.897)	(2.568)	(2.961)	(2.500)	(1.760)	(1.601)
Mkt. Leverage $_{t-1}$	-0.113***	-0.124***	-0.107***	-0.112***	-0.151***	-0.155***
	(-6.688)	(-6.188)	(-7.046)	(-6.361)	(-7.210)	(-6.144)
(R&D + CAPEX) $_{t-1}$	-0.098***	-0.090**	-0.076*	-0.066	-0.085*	-0.068
	(-2.631)	(-2.101)	(-1.879)	(-1.429)	(-1.690)	(-1.208)
Earnings volatility $_{t-1}$	0.146***	0.138**	0.111**	0.120**	0.050	0.069
	(2.899)	(2.268)	(2.282)	(2.157)	(0.891)	(0.953)
Market-to-book $_{t-1}$	0.001***	0.001***	0.001***	0.001***	0.001**	0.000
	(3.500)	(2.733)	(3.762)	(2.824)	(2.433)	(1.618)

(continues)

(continued)

	Dependent: Repurchases					
Variables	(1)	(2)	(3)	(4)	(5)	(6)
N	5,951	4,756	6,932	5,620	4,306	3,560
Adj. R-squared	0.145	0.152	0.143	0.147	0.169	0.171
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

By testing the possibility of reverse causality, we enhance our understanding of the causes and outcomes associated with CSR contracting while mitigating endogeneity concerns discussed in Section 3.5. To implement this analysis, we re-estimate equation (1) and include all control variables and fixed effects in the regressions. However, there is a key difference: we reverse the positions of CSR contracting and repurchases. In other words, we regress CSR contracting on past share repurchases. Accordingly, we use *CSR contracting* and *% CSR contracting* as the main dependent variables. We use *Repurchases*, *CRSP repurchases,* and *Treasury repurchases* as the main regressors. All measures of repurchases are lagged by one year. Table 3.6 reports the reverse causality analysis's results. We find no evidence that different measures of repurchases affect CSR contracting measures. Collectively, the finding addresses concerns related to reverse causality.

Table 3.6. Addressing reverse causality concern

This table examines whether past share repurchases affect the adoption of CSR contracting. The dependent variables are *CSR contracting* and *% CSR contracting*. *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. The main explanatory variables are measures of repurchases constructed from Compustat and CRSP, as discussed in Section 3.2.2. The same control variables and fixed effects as in the baseline regression (Table 3.2) are included. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of Variables" section.

	CSR contracting			% CSR contracting		
Variables	(1)	(2)	(3)	(4)	(5)	(6)
$Repurchases_{t-1}$	-0.247**			-0.005		
	(-2.087)			(-1.593)		
$CRSP\ Repurchases_{t-1}$		-0.067			-0.003	
		(-0.918)			(-1.477)	
$Treasury\ Repurchases_{t-1}$			-0.178			-0.003
			(-1.442)			(-0.934)

(continues)

(continued)

	CSR contracting			% CSR contracting		
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Size $_{t-1}$	-0.024	-0.016	-0.021	-0.000	-0.000	-0.000
	(-0.902)	(-0.619)	(-0.795)	(-0.567)	(-0.144)	(-0.460)
Ln(Firm age) $_{t-1}$	-0.038	-0.042	-0.041	-0.001	-0.001	-0.001
	(-0.548)	(-0.594)	(-0.591)	(-0.416)	(-0.336)	(-0.451)
ROA $_{t-1}$	0.117	0.068	0.096	-0.000	-0.001	-0.001
	(1.102)	(0.630)	(0.904)	(-0.058)	(-0.170)	(-0.266)
Cash/TA $_{t-1}$	-0.176*	-0.168*	-0.171*	-0.004	-0.004	-0.004
	(-1.783)	(-1.688)	(-1.731)	(-1.587)	(-1.630)	(-1.559)
Mkt. Leverage $_{t-1}$	0.048	0.034	0.047	0.002	0.002	0.002
	(0.394)	(0.275)	(0.385)	(0.603)	(0.586)	(0.633)
(R&D + CAPEX) $_{t-1}$	0.232	0.260	0.222	0.010	0.013	0.009
	(0.827)	(0.956)	(0.793)	(1.202)	(1.610)	(1.152)
Earnings volatility $_{t-1}$	1.106***	1.046***	1.108***	0.038**	0.038**	0.038**
	(2.875)	(2.692)	(2.876)	(2.103)	(2.040)	(2.110)
Market-to-book $_{t-1}$	-0.001	-0.001	-0.001	0.000	0.000	0.000
	(-0.801)	(-0.910)	(-0.854)	(0.226)	(0.133)	(0.207)
N	6,988	6,884	6,967	5,518	5,435	5,499
Adj. R-squared	0.121	0.121	0.121	0.030	0.031	0.029
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

3.5. Addressing endogeneity concerns

To this point, although our baseline analysis and robustness checks have consistently shown that CSR contracting has an adverse effect on share repurchases, there are endogeneity concerns that could potentially render our conclusions spurious. There may be some unobserved factors that could influence both the likelihood of adopting CSR contracting and firms' repurchase decisions. If such unobserved factors exist, the relationship between CSR contracting and repurchases would remain negative, even though, in reality, CSR contracting may not have a meaningful causal effect on share repurchases.

One ideal solution to mitigate endogeneity concerns and ensure the reliability of our baseline findings is to compare, at the same period, the variation of repurchases when a firm decides to link CEO compensation to CSR criteria and when it does not. Nevertheless, the level of repurchases under the latter circumstance is unobservable, thus making this experiment infeasible.

The second solution is to implement an alternative experiment in which we compare the level of repurchases of a firm (with CSR contracting) with the level of repurchases of another matched firm that can be considered sufficiently similar to the initial firm. By matching these two firms and making them indistinguishable, we can assess how the presence of CSR contracting influences repurchases, which otherwise are potentially affected by unobserved factors that we cannot measure and control for.

In this perspective, one common approach to alleviate endogeneity concerns is the Difference-in-differences (DiD) analysis. In this section, we aim to observe how firms' levels of repurchases vary before and after the treatment event. Accordingly, we consider the first-time adoption of CSR contracting as the treatment event since this event highly likely has the largest impact on executive behaviour and subsequent firm outcomes, compared to later firm-years with CSR contracting. In addition, the effect of the first-time adoption is not confounded by the effects of CSR contracting provisions in the previous years.

Then, we separate the dataset into two groups: (i) the treatment group in which firms adopt CSR contracting for at least one time; and (ii) the control group in which firms do not adopt CSR contracting ever. To qualify for the DiD analysis, all included firms must have the data observations five years before (year *t-5*, year *t-4*, year *t-3*, year *t-2*, and year *t-1*) and five years after (year *t+1*, year *t+2*, year *t+3*, year *t+4*, and year *t+5*) the first-time adoption of CSR contracting (i.e., the treatment event, year *t*). The chosen lengths of pre- and post-treatment periods are long enough to retain sufficient observations for accurate analyses. We also exclude the treatment year (year *t*) to avoid the noise caused by the transition.

In the second step, we perform matching between firm-year observations in the treatment group and those in the control group, ensuring that the matched firms are indistinguishable from each other. To implement this step, we estimate the propensity score that measures whether a firm is a treated or control firm, using the probit regression model. We implement the one-on-one matching without replacement, meaning that one treated observation is matched with one control observation, and both observations cannot be returned to the initial sample and paired more than once. Regarding the matching quality, we need to consider a potential trade-off. If the firm-year

observations are matched too closely, we may end up with few well-matched pairs, making the results of the DiD analysis not reliable. Conversely, if the matching criteria are too loose, the impact of unobserved factors on the outcomes may increase since the samples of treated and control firms are no longer indistinguishable. To address this concern, we conduct a propensity score matching with a caliper of 0.05, indicating that the maximum difference in propensity scores between a pair of firms is set at 0.05.[32]

As shown in Panel A of Table 3.7, the post-match differences between firm characteristics (as in the baseline specification) are not statistically significant, meaning that the matched treated and control firms are statistically indifferent. As a result of the matching procedure, any variation in the level of repurchases after year t is highly likely due to the effect of the first-time adoption, not the pre-existing differences between firms. After the matching procedure, we are left with 1300 observations, equivalent to 65 pairs of firms. We then use this sample to estimate the average treatment effect of CSR contracting on share repurchases by estimating the following specification.

$$Repurchases_{i,t} = \alpha + \beta_1 \times Treatment_{i,t} + \beta_2 \times Post_{i,t} + \beta_3 \times Treatment_{i,t} \times Post_{i,t} + \beta_4 \times Controls_{i,t} + Firm_i + Year_t + \epsilon_{i,t} \quad (3)$$

Where *Repurchases* is Compustat repurchases scaled by total book assets. *Treatment* is an indicator that equals one for treated firms, and zero otherwise. *Post* is an indicator that equals one for fiscal years before the year of the first-time adoption, and zero otherwise. *Controls* is a vector of control variables included in the baseline analysis.

We report the estimation results of equation (3) in Panel B of Table 3.7. In Column 1, we find that the interaction term between *Treatment* and *Post* is negative and significant when the dependent variable is *Repurchases*. To examine the robustness of the result, we estimate the same equation using Compustat Repurchases divided by firm sales (i.e., *Repurchase/Sales*) and report the result in Column 2. Again, the interaction term between *Treatment* and *Post* is negative and significant.

[32] Our results remain the same if we adjust the caliper to different values, including 0.01, 0.005, 0.001 and 0.0005, to allow for stricter or looser matching.

Collectively, these results lend support to the notion that the first-time adoption of CSR contracting has a negative and considerable impact on repurchases, compared to the pre-treatment period.

In the final analysis of this section, we examine the parallel trend assumption on which the DiD analysis relies. The parallel trend assumption states that the variation of the outcome variable would be the same (i.e., similar trends) for the treated and control groups in the absence of CSR contracting adoption. Following the approach of Samuels (2021), we examine the difference in the level of repurchases between treated firms and control firms each year before and after the first-time adoption. Accordingly, for each year surrounding the adoption year, we construct a corresponding indicator variable that equals one for this year, and zero otherwise. After implementing this procedure, we have a list of indicator variables, including Pre_{t-5}, Pre_{t-4}, Pre_{t-3}, Pre_{t-2}, and Pre_{t-1} for five years before the adoption, and $Post_{t+1}$, $Post_{t+2}$, $Post_{t+3}$, $Post_{t+4}$, and $Post_{t+5}$ for five years after the adoption. We re-estimate equation (3) and include the interaction terms between *Treatment* and these time indicator variables, while omitting the Pre_{t-5} variable and its interaction term. Panel C of Table 3.7 reports the regression results. For the period of four years before the first-time adoption, the coefficients of the interaction terms are insignificant, suggesting that the difference-in-differences of the two groups' repurchases are insignificant. On the contrary, the difference-in-differences becomes statistically significant in year *t+2*, year *t+3*, and year *t+4* at the 10% level. However, the difference-in-differences in year *t+5* is not statistically significant, indicating a potential weakening effect of the first-time adoption after the first four years. We illustrate these results in Figure 3.2. The figure suggests similar trends of repurchases between two groups of firms before the adoption, and then the significant divergence of the trends coincides with the introduction of CSR contracting.

Table 3.7. Difference-in-Differences analysis using the first-time adoption of CSR contracting

This table reports the results of the difference-in-differences analysis using the first-year adoption of CSR contracting as the treatment event. Panel A reports the covariate balance between the treatment and control groups. Panel B reports the results of the difference-in-differences regressions. The dependent variables are the value of repurchases scaled by total book assets and the value of repurchases scaled by firm sales. *Treatment* is an indicator that equals one for treatment firms, and zero otherwise. *Post* is an indicator variable that equals one for fiscal years after the first year of CSR contracting adoption, and zero otherwise. Panel C examines the difference-in-differences of the impacts of CSR

contracting on repurchases by years surrounding the first-time adoption. The same control variables and fixed effects as in the baseline regression (Table 3.2) are included. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of Variables" section.

Panel A. Post-matching differences between firm characteristics

Variables	Treated	Control	Difference	t-stat	p-value
Size	9.659	9.607	0.052	0.770	0.440
Ln(Firm age)	3.515	3.528	-0.014	-0.480	0.629
ROA	0.059	0.060	-0.001	-0.230	0.818
Cash/TA	0.135	0.142	-0.007	-0.910	0.362
Mkt. Leverage	0.144	0.144	0.000	-0.030	0.978
(R&D + CAPEX)	0.066	0.067	0.000	-0.150	0.877
Earnings volatility	0.021	0.021	0.000	-0.350	0.728
Market-to-book	4.019	3.919	0.100	0.410	0.679

Panel B. Difference-in-Differences estimators

	Repurchases/TA	Repurchase/Sales
Variables	(1)	(2)
Post	0.005	0.006
	(1.51)	(1.05)
Treatment x Post	-0.011**	-0.023**
	(-1.98)	(-2.35)
$Size_{t-1}$	0.008	0.015
	(1.05)	(1.33)
$Ln(Firm\ age)_{t-1}$	-0.008	-0.017
	(-0.26)	(-0.39)
ROA_{t-1}	0.098**	0.097
	(2.53)	(1.54)
$Cash/TA_{t-1}$	0.068*	0.101**
	(1.89)	(1.98)
$Mkt.\ Leverage_{t-1}$	-0.141***	-0.219***
	(-3.81)	(-3.43)
$(R\&D + CAPEX)_{t-1}$	-0.006	-0.100
	(-0.05)	(-0.64)
$Earnings\ volatility_{t-1}$	0.066	0.035
	(0.66)	(0.22)
$Market\text{-}to\text{-}book_{t-1}$	0.000	-0.000
	(0.65)	(-0.16)
N	1,300	1,300

(continues)

(continued)

	Repurchases/TA	Repurchase/Sales
Variables	(1)	(2)
Adj. R-squared	0.19	0.13
Firm FE	Yes	Yes
Year FE	Yes	Yes

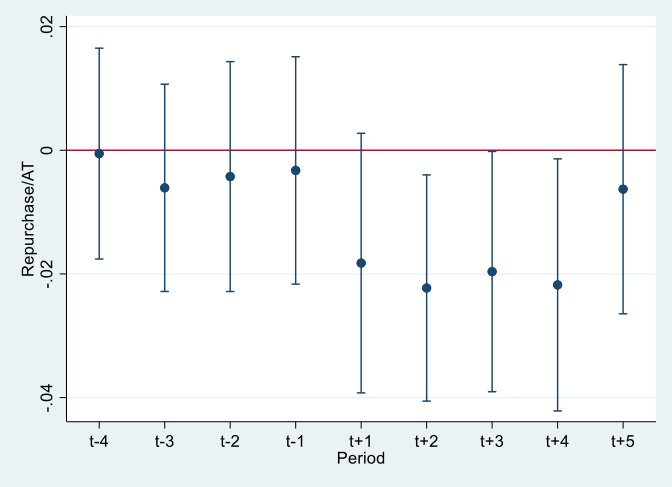
Panel C. Evidence supporting the parallel trend assumption

	Repurchases/TA
Variables	(1)
Treatment x Pre_{t-4}	-0.001
	(-0.05)
Treatment x Pre_{t-3}	-0.006
	(-0.60)
Treatment x Pre_{t-2}	-0.004
	(-0.38)
Treatment x Pre_{t-1}	-0.003
	(-0.29)
Treatment x $Post_{t+1}$	-0.018
	(-1.43)
Treatment x $Post_{t+2}$	-0.022**
	(-2.01)
Treatment x $Post_{t+3}$	-0.020*
	(-1.67)
Treatment x $Post_{t+4}$	-0.022*
	(-1.76)
Treatment x $Post_{t+5}$	-0.006
	(-0.52)
N	1,300
Adj. R-squared	0.19
All control variables	Yes
Firm FE	Yes
Year FE	Yes

Figure 3.2. Checking parallel trend assumption

This figure displays the fluctuation of share repurchases around the first-time adoption of CSR contracting, as discussed in the DiD analysis in Section 3.5. The sample consists of firm-year observations five years before and five years after the introduction of CSR contracting. Accordingly, this figure presents the difference-in-differences in the levels of Compustat repurchases scaled by total book assets, estimated in Panel C of Table 3.7, between CSR contracting adopters

and non-adopters with similar characteristics for all years relative to year *t-5*. The year of the first-time adoption is denoted as year *t* and is not included in this analysis. The bars demonstrate 90% confidence intervals.



3.6. CSR contracting and dividends

Although we have provided consistent evidence indicating the significant impacts of CSR contracting on repurchases, two important unanswered questions remain. These questions relate to the fact that, besides repurchases, paying dividends is another important method to distribute earnings to shareholders. The first question is: Does CSR impact dividend policy similarly to how it affects repurchases? The answer is likely to be "No". In a survey study by Brav et al. (2005), top executives expressed the view that dividend policy is very sticky, and they demonstrated a desire to avoid cutting dividends at all costs, for two reasons. First, cutting dividends may convey negative information about a firm's financial health to the market, as empirical evidence suggests that dividend decisions are positively associated with a firm's ability to produce permanent and stable cash flows (Jagannathan et al., 2000). Second, cutting dividends can generate excess cash flows that are susceptible to managerial manipulation for overinvestment. As a result, cutting dividends is often associated with adverse reactions from market participants (Daniel et al., 2010). Therefore, unlike repurchase decisions which are secondary to investment decisions, maintaining dividends is equally important to investment policy. Collectively, we conjecture that CSR contracting would not have a negative impact on dividend policy, paralleling its moderating effect on share repurchases.

The second question is whether incentivised CEOs would reduce repurchases and increase dividends as a substitute for repurchases in distributing excess cash to shareholders. The answer

to this question is likely to be "No". Accordingly, increasing current dividends represents implicit commitments that firms would maintain future dividends at the increased level (Jagannathan et al., 2000). This approach is risky because if firms cannot generate sufficient cash flow in the future, it would be challenging to maintain an aggressive dividend policy and efficient investment policy simultaneously. Indeed, Daniel et al. (2010) find that firms respond to cash shortfalls by reducing investments while avoiding cutting dividends to maintain access to the capital market. Therefore, we conjecture that the resources preserved after reducing repurchases would not be transferred to investors through increased dividends.

To empirically test these conjectures that correspond to Hypothesis 4, we regress a measure of dividends on CSR contracting measures and report the results in Table 3.8. We re-estimate equation (1) but replace *Repurchases* with a variable *Dividends* calculated as the cash dividends divided by total book assets. We use *CSR contracting* (Column 1) and *% CSR contracting* (Column 2) as the main regressors, while controlling for other variables and fixed effects used in the baseline analysis. In Columns 1 and 2, we find that CSR contracting has no significant impact on dividend policy, which is consistent with our conjectures.

To strengthen the above findings, we replicate the DiD analysis in Section 3.5, using the first-time adoption of CSR contracting as the treatment event and estimate the average treatment effect of CSR contracting on *Dividends*. Accordingly, the same DiD analysis settings as in Section 3.5, including the empirical specification, matching method, and parameters, are applied. Then, we regress *Dividends* on the variables *Treatment*, *Post*, and their interaction terms as in Section 3.5, while controlling for other firm characteristics. We report the regression results in Column 3 of Table 3.8. Unlike share repurchases, the interaction term between *Treatment* and *Post* is insignificant, suggesting that first-time CSR contracting adopters exhibit indifferent levels of dividend payments to indistinguishable non-adopters. Collectively, these findings lend support to the notion that CEOs with CSR contracting neither decrease dividends nor distribute the preserved resources resulting from repurchase reduction to shareholders via dividends.

Table 3.8. CSR contracting and dividend policy

This table examines the impacts of CSR contracting on dividend policy. The dependent variable is *Dividends,* which is the ratio of cash dividends to total book assets. In Columns 1 and 2, the main explanatory variables are *CSR contracting* and *% CSR contracting*. *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. In Column 3, we report the results of the difference-in-differences regressions, which are similar to the regressions in Table 3.7. However, we substitute *Repurchases* with *Dividends* as the dependent variable. Regarding the main regressors in Column 3, *Treatment* is an indicator that equals one for treatment firms, and zero otherwise. *Post* is an indicator variable that equals one for fiscal years after the first year of CSR contracting adoption, and zero otherwise. The same set of control variables and fixed effects as in the baseline regression (Table 3.2) are included in all regressions. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of Variables" section.

	Dependent: Dividends		
Variables	(1)	(2)	(3)
CSR contracting$_{t-1}$	-0.000		
	(-0.06)		
% CSR contracting $_{t-1}$		-0.019	
		(-1.24)	
Post			0.001
			(1.12)
Treatment x Post			0.001
			(0.47)
Size $_{t-1}$	-0.002*	-0.001	-0.001
	(-1.83)	(-1.08)	(-0.73)
Ln(Firm age) $_{t-1}$	0.007***	0.005*	0.022**
	(2.74)	(1.84)	(2.13)
ROA $_{t-1}$	0.030***	0.026***	0.043***
	(5.68)	(4.36)	(3.37)
Cash/AT $_{t-1}$	0.008	0.010*	0.012
	(1.51)	(1.70)	(0.99)
Mkt. Leverage $_{t-1}$	-0.011**	-0.009	-0.019*
	(-2.08)	(-1.52)	(-1.81)
(R&D + CAPEX) $_{t-1}$	-0.023	-0.025	-0.016
	(-1.43)	(-1.41)	(-0.44)
Earnings volatility $_{t-1}$	-0.022	-0.036**	-0.028
	(-1.59)	(-1.99)	(-1.13)
Market-to-book $_{t-1}$	0.000***	0.000**	0.000
	(3.23)	(2.35)	(0.47)
N	8,160	6,646	1,300
Adj. R-squared	0.17	0.16	0.22
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

3.7. Conclusion

To explain the significant role and rapid development of share repurchases as a major method of distributing earnings to shareholders, recent research has increasingly focused on the influence of executive compensation designs on repurchases (e.g., Kahle, 2002; Cheng et al., 2015; Edmans et al., 2022). Notably, empirical evidence shows that typical compensation designs, such as options compensation, earnings-contingent bonuses, and vesting equity, share a common characteristic of motivating managers to adopt an aggressive repurchase policy to maximise personal wealth, even though this policy may destroy firms' long-term growth. When public demand for corporate social responsibility increases and more attention is paid to a new governance practice that links CEO compensation to CSR metrics, a natural question arises as to whether this initiative has a similar impact as other compensation designs, or it will incentivise CEOs to act differently to serve the interests of various stakeholders. To answer this question, this chapter empirically examines the impact of CSR contracting on share repurchases.

By constructing a novel dataset containing information about the presence and the substantiveness of CSR contracting from proxy statements of S&P 500 companies between 2000 and 2018, we document consistent evidence that CSR contracting provisions motivate CEOs to reduce and avoid repurchasing shares. These findings survive a series of robustness checks when we use alternative measures of repurchases, use different observation windows, control for additional variables, examine alternative explanations, and alleviate the endogeneity concerns. We further find that the adverse impact of CSR contracting on repurchases is not equal in all circumstances since there is evidence that the impact is stronger for firms having higher cash flow volatility and more investment opportunities. This result suggests that incentivised CEOs retain the necessary amount of capital to engage with stakeholders by adopting a more conservative repurchase policy, thereby avoiding the risk of financial constraints that are detrimental to the interests of stakeholders.

On further exploring whether CSR contracting has the same influence on dividends, we find that CEOs neither cut dividends nor distribute the preserved capital from repurchase reduction to shareholders through increased dividends. Overall, our findings support the view of Flammer et

al. (2019) by demonstrating the effectiveness of CSR contracting in motivating CEOs to prioritise stakeholders' interests in their decision-making process, as evidenced by more conservative repurchase decisions. More importantly, our evidence contradicts the rent-extraction view regarding the actual effect of CSR contracting, as highlighted in Bebchuk and Tallarita (2022).

Chapter 3 Appendix. Definitions of variables

Variables	Definitions	Sources
CSR contracting measures		
CSR contracting	Indicator equal to one if a firm adopts CSR contracting provision, and zero otherwise.	Form DEF 14A, SEC's EDGAR
% CSR contracting	The actual percentage of CSR-based compensation over total CEO compensation.	Form DEF 14A, SEC's EDGAR
Share repurchase measures		
Repurchases	Share repurchases divided by total book assets.	Compustat
CRSP repurchases	The multiplication of the average monthly closing stock price and the aggregated monthly decrease in the number of shares outstanding reported in the CRSP database, adjusted for stock splits.	CRSP
Treasury repurchases	The increase in the common treasury stock scaled by total book assets. If *Treasury Repurchases* equals zero or is missing, the corresponding value is calculated as the difference between stock purchases and stock issuances scaled by total book assets. If the increase in the common treasury stock and the difference between stock purchases and stock issuances are negative, the corresponding value of Treasury Repurchases equals zero.	Compustat
Repurchase initiation	An indicator that equals one if a firm does not repurchase in the last two years and then initiates a repurchase programme, and zero otherwise.	Compustat
Firm characteristics		
Size	The natural logarithm of total book assets.	Compustat
Ln(Firm age)	The natural logarithm of firm age, where firm age is the number of data years that a firm has in the Compustat database.	Compustat
ROA	Net income scaled by total book assets.	Compustat
Cash/TA	Cash and Short-term Investments divided by total book assets.	Compustat
Mkt. leverage	The sum of debts in current liabilities and long-term debts divided by the market value of assets.	Compustat
(R&D + CAPEX)	The sum of R&D expenses and capital expenditures, scaled by total book assets.	Compustat

Variables	Definitions	Sources
Earnings volatility	The 5-year standard deviation of income before extraordinary items scaled by total book assets.	Compustat
Market-to-book	The market value of equity divided by the book value of equity.	Compustat
Cash flow volatility	The 5-year standard deviation of operating income before depreciation, minus total interest and related expenses, minus total income taxes, scaled by total book assets.	Compustat
Tobin's Q	The sum of market equity and total liabilities, divided by total book assets.	Compustat
Dividends	Cash dividends divided by total book assets.	Compustat
CEO and board characteristics		
Option ownership	CEO's option compensation scaled by total shares outstanding.	ExecuComp
Stock ownership	CEO's stock compensation scaled by total shares outstanding.	ExecuComp
Board independence	The ratio of the number of independent directors to the board size.	ISS Director US
E index	The sum of six indicators that equals one if firms have each of the following antitakeover provisions: staggered boards, limits to amend bylaws, supermajority, golden parachutes, and poison pill.	Bebchuk et al. (2009) & ISS Governance

Chapter 4. Managerial stakeholder-oriented incentives and corporate risk-taking

Abstract

This study examines the impact of including CSR criteria in executive compensation, known as CSR contracting, on corporate risk-taking. Using a hand-collected dataset of S&P 500 companies between 2000 and 2018 that delineates the use and substantiveness of CSR contracting, we find that firms adopting this provision experience lower volatility due to more conservative managerial choices of corporate policies. This finding is robust to various robustness checks and alternative econometric specifications that alleviate endogeneity concerns. We interpret our results that CSR-based compensation motivates CEOs to account for stakeholders' low-risk preferences, leading them to adopt a more prudent approach to risk-taking. In the meantime, we rule out alternative explanations that the moderating effect of CSR contracting is due to the exacerbation of agency problems and CEOs' risk aversion. Further empirical tests show that CSR contracting is more effective when firms are highly financially constrained and reside in areas with higher levels of social capital that encourage more effective stakeholder engagement. Finally, we document that the risk-reduction effect of CSR contracting is not sub-optimal, since this provision improves firm performance, especially in the face of higher market volatility. Overall, our findings identify CSR contracting as a novel compensation design that moderates corporate risk-taking to protect stakeholders without sacrificing firm performance.

4.1. Introduction

The growing importance of corporations serving stakeholders' interests beyond traditional shareholder value maximisation has recently become a prominent issue on the corporate agenda. This perspective is exemplified by the response made by Alex Gorsky, CEO of Johnson & Johnson, asserting in his recent interview that "It affirms the essential role corporations can play in improving our society when CEOs are truly committed to meeting the needs of all stakeholders".[33] Nevertheless, while CEOs make regular corporate decisions that potentially

[33] The "Statement on the Purpose of a Corporation" of the Business Roundtable, August 19, 2019, and related interviews are available at https://www.businessroundtable.org/business-roundtable-redefines-the-purpose-of-a-corporation-to-promote-an-economy-that-serves-all-americans

affect various stakeholders, such as employees, customers, and the local community, they may lack adequate incentives to align their decisions with the goal of enhancing stakeholder value (Bebchuk and Tallarita, 2022). To transition managerial focus from exclusive shareholder emphasis to encompassing diverse stakeholders' interests, firms increasingly link CEO compensation to CSR performance criteria.[34] Practitioners and academics term this novel remuneration design as CSR contracting (Hong et al., 2016; Flammer et al., 2019).

Much of the prior literature on CEO compensation highlights the importance of having proper compensation designs that align the interests of managers with those of shareholders (e.g., Jensen and Murphy, 1990; Bizjak et al., 1993; Guay, 1999; Core and Guay, 2002; Coles et al., 2006). Nevertheless, when the incentive alignment expands to include the interests of non-shareholder stakeholders through the presence of CSR contracting, little is known about the impacts of CSR-based compensation on managerial behaviour and its economic implications. A notable study by Flammer et al. (2019) stands out as an exception, which shows that the presence of CSR contracting provisions enhances innovation, CSR performance, and firms' future value. We aim to complement this study by investigating an important, yet unexplored, aspect of CSR contracting: its impact on corporate risk-taking.

From one perspective, CSR-based compensation may reduce CEOs' incentives to take risks if its presence addresses the inherent conflict of risk preferences between shareholders and stakeholders (Jensen and Meckling, 1976). Shareholders typically possess greater flexibility than stakeholders in selecting firms for investment and timing disengagement. This stems from the enhanced liquidity and the ease of diversification associated with their investments. In this vein, holding well-diversified portfolios and having residual claims encourage shareholders to take risks because they have limited exposure to firm-specific risks, while the potential gains on the upside are significantly higher (Faccio et al., 2011). Unlike shareholders, stakeholders enter the transactions with firms on a long-term basis, with much of the future claims remaining implicit.

[34] Bebchuk and Tallarita (2022) report that 52.6% of S&P 100 companies had linked CEO compensation to CSR criteria in 2020. Among these companies, the majority (80.4%) prioritised employee treatment, followed by 62.7% focusing on employee compensation, 49% focusing on customers, 39.2% focusing on environmental performance, 19.6% focusing on local communities, and 3.9% focusing on suppliers.

Accordingly, stakeholders cannot unwind their affiliations with firms quickly and cost-effectively since their claims cannot be traded independently on the market (Cornell and Shapiro, 1987; Gao et al., 2021). Therefore, stakeholders generally exhibit lower tolerance for risk because being fixed claimants of firms makes them vulnerable to potential downside risks. For example, financial constraints that restrict access to available capital may force firms to renege on their commitments toward stakeholders, including investments to enhance workplace safety (Cohn and Wardlaw, 2016) and environmental performance (Xu and Kim, 2022). If CSR contracting provisions drive managerial focus on the needs and concerns of various stakeholders, incentivised CEOs should avoid taking excessive risk to preserve sufficient financial resources for stakeholder engagement. By doing so, CEOs balance the risk preferences of shareholders and stakeholders, resulting in a decrease in firm risk compared to a management model solely focusing on shareholder value maximisation.

Alternatively, CSR-based compensation can potentially exacerbate the agency problem, resulting in a subsequent reduction of firm risk. Accordingly, there are several concerns with the use of CSR contracting. First, CSR contracting may not be effective in aligning the interests of CEOs and stakeholders, since there are inherent conflicts of interests within stakeholders themselves (Flammer et al., 2019).[35] If firms attempt to include as many CSR criteria as possible to solve this problem, this may aggravate the problem of multidimensional tasks in which incentivised CEOs tend to focus on more measurable financial targets, rather than CSR objectives (Bebchuk and Tallarita, 2022). Second, CSR contracting provisions are characterised by the lack of measurability and reviewability, rendering external monitoring less effective (Bebchuk and Tallarita, 2022). These characteristics may exacerbate the agency problems by rewarding CEOs for limited managerial efforts toward enhancing stakeholder value. Indeed, incentivised CEOs may overinvest in CSR-related projects to buy public support and retain firms' access to important resources (Berrone and Gomez-Mejia, 2009). In this vein, CSR investments can serve as a shield,

[35] For example, local communities are interested in how a firm's operations affect local employment and environmental issues (e.g., air pollution, water usage, energy usage). Meanwhile, customers have shorter-term claims about pricing and after-sales customer services (e.g., software updates, repair and maintenance). In this example, engaging with customers and maintaining competitive product prices (by outsourcing manufacturing to international partners with low-cost labour) may create a conflict with the target of promoting long-term job creation in the local area where the firm operates.

masking weak financial performance and enabling CEOs to avoid risky, yet profitable, investments to enjoy a "quiet life" (Bertrand and Mullainathan, 2003). Collectively, the critiques of CSR contracting provide an alternative explanation suggesting that this remuneration scheme may have either no impact or a negative effect on corporate risk-taking.

Contrary to the preceding arguments, the adoption of CSR contracting may exhibit a positive correlation with corporate risk-taking. Existing CSR literature indicates that a favourable CSR reputation can mitigate a firm's exposure to both idiosyncratic and systemic shocks. As posited by Godfrey (2005), socially responsible decisions create moral capital that acts as a protective buffer against potential losses resulting from negative stakeholder reactions to various firm activities. This moral capital safeguards the firm's intangible assets. Moreover, Albuquerque et al. (2019) provide empirical evidence indicating that firms with a strong emphasis on CSR tend to experience lower price elasticity of demand, allowing them to maintain higher product prices, particularly during macroeconomic shocks. Consequently, these firms display lower profit elasticity in response to aggregate shocks, making them appear more resilient to systemic risk. In line with these perspectives, Dunbar et al. (2020) discover that superior ex-ante CSR performance enhances a firm's capacity for risk-taking, prompting the provision of greater risk-taking incentives to CEOs. Following this line of reasoning, if incentivized CEOs, through CSR contracting, effectively enhance future CSR performance, firms would likely possess greater risk-taking capacity and offer increased risk-taking incentives, such as higher option compensation, to CEOs. Consequently, it can be inferred that the adoption of CSR contracting with the aim of improving CSR performance may be positively associated with increased corporate risk-taking.

The varied perspectives on the effect of CSR contracting on corporate risk-taking motivate our study. To examine the effect of CSR contracting on CEOs' risk-taking, we construct a sample of Standard & Poor's 500 (S&P 500) companies from 2000 to 2018 that describes the use and the substantiveness of CSR contracting provisions in CEO compensation. Accordingly, we hand-collect data from firms' annual proxy statements (form DEF14A) and construct the following measures. *CSR contracting* is a binary variable that indicates whether a firm links CEO compensation to CSR criteria. *% CSR contracting* is the ratio of CSR-based compensation to total

CEO compensation. Following prior literature, we use the annualised standard deviation of stock return (i.e., *Return volatility*) to measure the level of firm risk. This measure captures the outcome of risk-taking in firms' investment, operating and financing activities (e.g., Coles et al., 2006; Bernile et al., 2018; Chen et al., 2022). Using both measures of CSR contracting, we show that firm risk is negatively associated with the adoption of CSR contracting and its substantiveness. Our findings continue to hold after we conduct a number of robustness checks, such as using alternative measures of firm risk, excluding observations relating to the 2007-2009 financial crisis, controlling additional risk-taking determinants, and implementing a falsification test.

However, integrating CSR metrics into CEO compensation does not affect firm risk equally in all circumstances. First, prior literature suggests that financial constraints are particularly harmful to stakeholders because firms lack sufficient financial resources to engage with and protect stakeholders' interests (e.g., Cohn and Wardlaw, 2016; Xu and Kim, 2022). In this scenario, the presence of stakeholder-oriented incentives should be valuable and offer greater benefits in reducing firm risk when stakeholders' claims are more susceptible to downside risks. The second source of cross-sectional heterogeneity in the effect of CSR contracting may be due to the social capital factor. Accordingly, firms and managers are influenced by social norms and the density of social networks where they reside. If the local areas where firms reside are characterised by strong cooperative norms and dense associational networks, it is anticipated that managers would be less inclined to engage in opportunistic behaviour. In turn, managers can predict higher punishments (e.g., social ostracism, stigmatisation, negative moral sentiments) if they engage in corporate wrongdoing (Hoi et al., 2019). In this scenario, incentivised CEOs should receive more authentic and stronger incentives to engage with stakeholders. In line with these conjectures, we find that the risk-reduction effect of CSR contracting is more pronounced for firms that are financially constrained and place headquarters in areas with high levels of social capital. These findings support our central argument that CEOs with CSR contracting tend to adopt a prudent management approach to safeguard stakeholders' interests. As a result, they would behave more conservatively to compensate for the heightened risk imposed on stakeholders' claims.

Next, we highlight and examine three possible alternative explanations of the negative relationship between CSR contracting and corporate risk-taking. First, as a part of endogeneity tests, we examine whether past stock return volatility can explain the subsequent likelihood of CSR contracting adoption and its substantiveness. Accordingly, the results show that the impacts of historical firm risk on CSR contracting measures are insignificant. Second, in line with the rent-extraction view, CSR contracting may aggravate the agency problem that leads to a reduction in corporate risk-taking. If this explanation is valid, we expect that the moderating effect of CSR contracting on firm risk is stronger for firms with lower governance quality. We find no evidence supporting this argument. Third, the inherent uncertainty associated with CSR-based compensation may increase the compensation risk for incentivised CEOs. This is because CSR performance typically materialises over the long term, in contrast to financial performance (e.g., Derchi et al., 2020). As a result, CEOs may avoid taking risk to compensate for the uncertainty of CSR-based compensation. In this vein, the moderating effect of CSR contracting on firm risk should be more substantial if CEOs are less willing to take risk. Our regression results do not support this alternative hypothesis.

One concern about our baseline results is that the measures of CSR contracting are not exogenous and may correlate with omitted factors that also explain the level of firm risk. There is also a reverse causality concern when riskier firms may adopt symbolic CSR contracting to satisfy stakeholders and "buy" their protection against systemic shocks and adverse public reactions to corporate irresponsibility. Therefore, our baseline results about the causal relationship between CSR contracting and firm risk are inconclusive. We perform a battery of robustness checks to ensure our results are as free as possible from these concerns.

First, we employ a propensity score matching (PSM) analysis where firm-year observations with CSR contracting (i.e., the treatment group) are matched with observations without CSR contracting (i.e., the control group). We then compare the level of firm risk between two groups of firms. The PSM method isolates the difference due to the presence of CSR contracting, while removing all observable differences among firm-year observations. As a result, the difference in the level of firm risk is more likely due to the presence of CSR pay, not other firm characteristics.

We continue to find the negative relation between CSR contracting and firm risk. Second, we implement the difference-in-differences (DiD) analysis which observes the variation of firm risk surrounding the first-time adoption (i.e., the treatment event) of CSR contracting. Consistent with the baseline results, the DiD estimates suggest that the first-time adopters of CSR contracting experience a relatively lower level of firm risk after the treatment event, compared to the non-adopters.

Third, we use an instrumental variable approach to examine the exogenous effects of CSR contracting on firm risk. Following Flammer et al. (2019), we use the *Constituency statutes* instrument, which equals one for a US state that enacts this statute, and zero otherwise. Constituency statutes suggest that firms should focus on the benefits of a broader range of stakeholders, rather than shareholder value only. In this vein, managers are not considered to breach their fiduciary duties to shareholders when considering the interests of other stakeholders in corporate decisions. Therefore, firms incorporated in states with constituency statutes are more likely to adopt CSR-based compensation, meaning that this instrument is relevant. Furthermore, because firms are not involved in the lobbying or the enactment process of constituency statutes, this instrument should not be related to corporate policies and strategies, thus offering a source of exogenous variation in the propensity of adopting CSR contracting. We continue to find significant and negative coefficients of (instrumented) CSR contracting measures across regressions.

Collectively, the above tests for endogeneity concerns strengthen our argument that CSR contracting reduces corporate risk-taking, and this conclusion is likely not due to the potential effects of omitted factors and reverse causality. Nevertheless, the results should be cautiously interpreted since the presence of CSR contracting provisions is not randomly assigned, and our sample only covers the top 500 US firms by market capitalisation. It is still possible that smaller firms may use CSR contracting differently for different purposes. Thus, it is still possible that the effect of CSR contracting on corporate risk-taking may vary for firms not included in our study.

Next, we examine the corporate policy channels leading to the negative relationship between CSR contracting and firm risk. The rationale of this analysis is that if CSR contracting moderates CEO

decisions, then the subsequent corporate policies adopted by incentivised CEOs should be more conservative and less idiosyncratic. Specifically, we focus on corporate decisions on financial leverage and research and development (R&D) spending, which measure firms' financial and operating risk (e.g., Coles et al., 2006; Ljungqvist et al., 2017). Our conjecture is that incentivised CEOs have strong incentives to adopt these policies more prudently. This conjecture is in line with prior literature, which suggests that socially responsible firms tend to adopt more conservative corporate policies to mitigate the adverse effects of the downside risk on stakeholders (e.g., Cornell and Shapiro, 1987; Holder et al., 1998; Ghaly et al., 2015; Chang et al., 2019). The results of our instrumental variable analysis show that after adopting CSR contracting, firms reduce leverage ratio and investments in R&D activities. This evidence sheds light on the mechanisms through which CSR contracting affects risk-related firm outcomes.

Although CSR contracting renders CEO decisions less extreme, this provision is not desirable if it ultimately leads to a deterioration of financial performance and induces adverse market reactions. It is possible that the multidimensionality of tasks, which consists of competing CSR and financial tasks, renders CEOs' allocation of time and efforts ineffective (Holmstrom and Milgrom, 1991), leading to sub-optimal risk-taking. Similarly, if incentivised CEOs avoid undertaking risky, yet profitable, investment projects to enjoy a quiet life, the reduction in firm risk would dampen firms' long-term growth. On the contrary, if CSR contracting provisions incentivise a more cautious management approach, in which CEOs actively monitor and manage risks effectively, the risk-reducing impact of CSR contracting would be beneficial for firms' short-term and long-term performance. Given these possibilities, we investigate whether CSR contracting is a double-edged sword that adversely affects firm performance. Our results show that this provision enhances firms' operating and stock performance. Interestingly, these positive effects are stronger when the higher market volatility threatens firms' long-term commitments toward stakeholders' interests. Overall, our findings support the view that the increased diversity of CEO pay makes managerial risk-taking more efficient.

Overall, our study contributes to the literature in several ways. First, we provide evidence that CSR contracting is a novel compensation design that can potentially influence managerial risk-

taking behaviour. Prior literature on risk-taking incentives has mainly focused on the impacts of executives' stock and option compensation, revealing two conflicting effects of these types of equity-based compensation on corporate risk-taking. On the one hand, stock options incentivise executives to take risk, since they can benefit from the convexity of the pay-for-performance relation (Guay, 1999; Core and Guay, 2002; Coles et al., 2006). This convexity, also known as vega, allows option holders to benefit from stock price increases, since they can earn the price difference, while avoiding significant losses when the stock price decreases below the strike price. On the other hand, executives' holdings of stocks increase the sensitivity of their wealth to stock price changes (i.e., delta), thus exposing them to higher firm risk (Coles et al., 2006). As a result, risk-averse managers with high delta have less incentive to take risk (Armstrong and Vashishtha, 2012).

In addition, recent studies have shown that other designs of compensation contracts can also affect corporate risk-taking. Accordingly, Bettis et al. (2018) examine the properties of performance-vesting (p-v) equity awards and find that the provisions of p-v awards based on accounting metrics contribute to managerial risk-taking. More recently, Do et al. (2022) investigate the relationship between relative performance evaluation (RPE) contracts, which reward managers based on firms' performance, compared to their peers, and corporate risk-taking. They show that managers, upon observing inferior interim performance relative to their peers, tend to undertake significantly greater risks to offset the preceding underperformance. In contrast, managers with stronger interim performance tend to behave more conservatively to protect their current gains. Complementing Bettis et al. (2018) and Do et al. (2022), our study reveals that the introduction of stakeholder-oriented compensation has a considerable impact on managerial risk-taking. Although the primary objective of firms in adopting CSR contracting is to direct managerial focus towards stakeholders' concerns, CSR-based compensation generates a "side-effect" in which incentivised CEOs behave more conservatively to mitigate downside risks that may weaken firms' ability to safeguard the interests of stakeholders.

Second, our study provides insights into the outcomes of addressing the conflict of interests, not only between managers and shareholders, but also between managers, shareholders, and

stakeholders. First, CEOs may be risk-averse, since their wealth, human capital, and career prospects are tied to firms' current and future performance (Gibbons and Murphy, 1992; Guay, 1999). Thus, risk-averse CEOs may avoid undertaking risky yet profitable investment projects, even though they acknowledge the importance of these projects for firms' long-term sustainability. In this vein, managerial risk aversion may conflict with shareholders' risk preferences, prompting firms to counterbalance by enhancing CEOs' risk-taking incentives, including increased pay convexity (Jensen and Meckling, 1976; Coles et al., 2006; Chen et al., 2022). Nevertheless, excessive corporate risk-taking is detrimental to stakeholder value because it increases the likelihood that firms renege on stakeholders' claims. Therefore, the presence of CSR-based compensation motivates CEOs to consider stakeholders' concerns in their agenda, thereby balancing the conflicting risk preferences of shareholders and stakeholders. Overall, our findings suggest that the introduction of CSR contracting mitigates CEOs' propensity to engage in excessive risk-taking.

Third, we contribute to the burgeoning literature that explores the economic implications of CSR contracting. Although the incorporation of CSR metrics into CEO compensation is receiving attention from practitioners, there remain unexplored facets of this design, including its effects on managerial behaviour, corporate policies, and firm outcomes. On the one hand, there are sceptical views regarding the agency costs of CSR contracting and the limited benefits that CSR contracting can provide to stakeholders (Bebchuk and Tallarita, 2022). On the other hand, recent studies document that CSR contracting positively affects future CSR performance, innovation, and firm value (Flammer et al., 2019; Tsang et al., 2021). More recently, Qin and Yang (2022) find evidence that CSR contracting influences CEO dismissal decisions of the boards of directors. Accordingly, CSR contracting communicates firms' long-term strategies, attracts socially responsible investors, and fosters trust-building and cooperation between firms and investors, thus reducing the CEO turnover-performance sensitivity. In this vein, our study complements this strand of literature by examining the impact of CSR contracting on firm risk. The importance of our findings is heightened by the strong development of CSR pay over the last decade (Eccles et al., 2014; Flammer et al., 2019; Bebchuk and Tallarita, 2022), and given that corporate risk-taking is one

crucial factor for practitioners to make decisions. Collectively, our research contributes to a more comprehensive understanding of the effects of CSR contracting, while providing additional insights to inform practitioners regarding the pros and cons of CSR contracting, and how to utilise this compensation design effectively.

Last, our study contributes to the broad view about the role of diversity in moderating corporate risk-taking. By constructing the board diversity index that incorporates different demographic and cognitive factors related to board members, Bernile et al. (2018) show that the heterogeneity of preferences, viewpoints, and incentives of directors can mitigate the adoption of idiosyncratic decisions within the board, thus resulting in less volatile firm outcomes. Similarly, Adams et al. (2005) emphasise the impact of excessive power possessed by CEOs on corporate risk-taking. They posit that powerful CEOs can make unchecked decisions that result in extreme firm outcomes in the absence of counterbalancing viewpoints from directors and other executives. Consistent with this perspective about the role of diversity, our study provides empirical evidence suggesting that diversity in executive compensation, characterised by the inclusion of multidimensional goals encompassing financial and non-financial (CSR) criteria, influences managerial decision-making. In this context, incentivised CEOs must consider the heterogeneous preferences of various stakeholders, thereby avoiding making aggressive decisions that result in volatile outcomes.

This study is organised as follows. Section 4.2 reviews the literature and develops hypotheses. Section 4.3 provides descriptions of the data sample, variable construction, empirical specifications, and summary statistics. Section 4.4 discusses the baseline results, robustness checks, cross-sectional heterogeneity analysis, and alternative explanations of the relationship. Section 4.5 addresses endogeneity concerns. Section 4.6 examines the impacts of CSR contracting on corporate policies and firms' operating and stock performance. Section 4.7 summarises the empirical findings and concludes.

4.2. Literature review and hypothesis development

4.2.1. CSR contracting and corporate risk-taking

In the modern economy, the roles and the influence of stakeholders become increasingly important in that they induce firms to adopt a range of stakeholder-oriented governance initiatives (e.g., Wang and Dewhirst, 1992; Eccles et al., 2014; Bebchuk and Tallarita, 2022). In essence, these changes stem from the business relationships between firms and stakeholders. Accordingly, a firm is formed by a nexus of contracts between itself and various stakeholders, as generalised by the stakeholder theory (Freeman, 1984). Stakeholders contribute to the firm's value-creating process by supplying production inputs (e.g., labour, raw materials) and purchasing final outputs while receiving payoffs for their investments into firms. In this view, the firm's claimants go beyond shareholders to include other non-shareholder stakeholders, such as creditors, employees, customers, and suppliers, that are salient to the firm's operations (Cornell and Shapiro, 1987). In turn, the firm engages with stakeholders to conform to institutional norms and the expectations of various stakeholders (Bansal, 2005). This approach fosters the firm's legitimacy and enables it to access resources provided by stakeholders on more favourable exchange terms and conditions (Berrone and Gomez-Mejia, 2009). Collectively, stakeholders' wealth and firm performance are closely tied to each other.

However, engaging with stakeholders and addressing relevant concerns are not straightforward, since firms need to address the inherent conflicts of interests between stakeholders and shareholders. A fundamental source of conflict between stakeholders and shareholders arises due to the difference in their risk preferences (Jensen and Meckling, 1976). Shareholders are typically characterised as having residual claims against firms. In addition, shareholders' portfolios are relatively more liquid than those of stakeholders, allowing them to unwind their affiliations with firms quickly (Gao et al., 2021). These attributes encourage shareholders to elevate corporate risk-taking, as greater gains are achievable through firm outperformance, rather than underperformance. If firm performance is not as shareholders' expectations, the liquidity capacity possessed by shareholders allows them to divest current investments quickly, thus minimising the impacts of idiosyncratic risk on their wealth (Faccio et al., 2011). Taken together, shareholders tend to take risk, and they can incentivise CEOs to behave correspondingly to maximise shareholder value.

Unlike shareholders, stakeholders have lower risk preferences and focus on the sustainable long-term performance of firms. Specifically, stakeholders enter transactions with the firm through explicit contractual agreements, which entitle them to possess fixed claims against the firm, and implicit agreements, which are long-term and difficult to formalise into contracts (Bowen et al., 1995). Accordingly, unless the firm undergoes financial distress, explicit claims of stakeholders are legally protected. Nevertheless, much of stakeholders' claims remain implicit (Cornell and Shapiro, 1987; Lins et al., 2017). These implicit claims include all non-contractual benefits promised by firms, such as employment promotion, workplace safety improvement, and ongoing product repair and maintenance. Unlike the fixed payoffs associated with explicit claims, implicit payoffs are asymmetric and uncertain. If firm performance exceeds expectations, the implicit payoffs would not increase much from the initial promises. In contrast, the firm may default on implicit claims if it faces financial constraints that leave insufficient financial resources to engage with stakeholders. Moreover, it is difficult for stakeholders to publicly trade their claims on the open market (Cornell and Shapiro, 1987). In adverse scenarios, stakeholders struggle to promptly disengage from firms, exposing them to corporate opportunism and long-term downside risks. Overall, these traits portray stakeholders as relatively illiquid firm claimants, implying a lower risk tolerance relative to shareholders.

There is considerable evidence supporting the view that excessive managerial risk-taking, which aligns with shareholders' risk preferences, can have negative consequences for stakeholders. Although undertaking risky, yet profitable, investments is necessary for long-term growth (John et al., 2008), firms having overly risky projects are likely to face significant losses and volatile cash flows. One consequence of holding excessive risky assets is financial constraints in which firms encounter cash shortfalls and a lack of alternative financial resources to maintain strategic investments (Daniel et al., 2010). Specifically, fulfilling stakeholder commitments typically incurs expenses encompassing both tangible and intangible investments.[36] If firms are financially constrained, they lack sufficient financial resources to purchase physical assets serving the

[36] Xu and Kim (2022) show that pollution abatement spending accounts for over 20% of US manufacturers' total capital expenditure. Similarly, Liu et al. (2021) report that by cutting the use of SO_2 scrubbers in their production to mitigate the impacts of gas emissions, Chinese firms save the costs equivalent from 0.4 to 1.4 cents per share.

interests of stakeholders (e.g., acquiring equipment for repairs and maintenance, purchasing high-quality tools to reduce on-the-job injury), and maintain appropriate training, supervision, and restructuring workflows (Cohn and Wardlaw, 2016). Similarly, financial constraints may also limit firms' ability to improve environmental performance and compliance (Xu and Kim, 2022). Therefore, financial constraints place substantial burdens on stakeholders, leaving their interests vulnerable and unprotected.

Although firms acknowledge the susceptibility of stakeholder value to managerial risk-taking, incentivising CEOs to consider stakeholders' interests is not a simple task. First, CEOs tend to focus on short-term performance, since they have career concerns (Gibbons and Murphy, 1992) and the compensation packages that are functions of short-term stock price (Stein, 1989). Market participants also pressure them to meet or beat short-term earnings benchmarks (Skinner and Sloan, 2002). On the contrary, CEOs may view CSR investments as risky investments with uncertain long-term value while having no immediate contribution to short-term profits (Hart, 1995; Berrone and Gomez-Mejia, 2009; Derchi et al., 2020). If CEOs engage extensively with stakeholders and underperform, the market may interpret this failure as an indication of managerial shortcomings, thus exacerbating their explicit costs (e.g., bonus and salary) and career concerns (e.g., external directorship opportunities) (Cai et al., 2020). More importantly, explicit contractual performance criteria often lack the requirement for CEOs to consider stakeholders' interests in their decision-making, with performance-based compensation traditionally emphasising financial targets that benefit shareholders primarily (Bebchuk and Tallarita, 2022). Unlike shareholders, stakeholders do not have the power to require firms to explicitly measure CEOs' performance through CSR targets, or prevent firms from providing excessive risk-taking incentives to CEOs.

In this context, a recent development of CSR contracting has the potential to transform the interaction between CEOs and stakeholders (Bebchuk et al., 2009; Flammer et al., 2019). It is reasonable to expect that when CEOs are held accountable for firms' CSR performance through CSR contracting, they may attempt to reallocate corporate resources toward stakeholder-oriented investments. As discussed above, because honouring stakeholders' claims is costly, highly

constrained firms may not have sufficient cash flows to pursue CSR and financial targets simultaneously. To prevent this adverse scenario, CEOs may refrain from making risky business decisions that would lead to highly volatile earnings and impose higher risk on stakeholders' claims. In other words, incentivised CEOs have stronger incentives to balance the conflicting risk preferences between shareholders and stakeholders. Therefore, we conjecture that firms adopting CSR contracting would exhibit a lower level of firm risk, as incentivised CEOs are inclined to adopt a more prudent approach towards risk-taking.

Hypothesis 1: CSR contracting reduces firm risk.

4.2.2. The moderating effects of CSR contracting on corporate policies

We also examine the corporate policy channels adjusted by incentivised CEOs to reduce firm risk. First, the extant literature shows that financial policy is one of the main determinants of firm risk. A high leverage ratio can elevate the risk of financial constraints for firms. Specifically, existing debts reduce cash flow through interest payments and limit firms' abilities to raise additional capital to fund investments (Ben-Zion and Shalit, 1975; Myers, 1984; Opler and Titman, 1994; Cohn and Wardlaw, 2016; Huang and Shang, 2019). When current debts mature, firms must roll over their debts by renegotiating with lenders. Moreover, during economic downturns, rapid increases in interest rates compel firms to pay higher costs for refinancing or selling essential assets at fire-sale prices, resulting in rollover losses (He and Xiong, 2012; Harford et al., 2014; Choi et al., 2021). In addition, because equity holders would primarily absorb rollover loss, firms may default on current debts if the loss is significant enough to make equity value negative (He and Xiong, 2012). Similarly, using more short-term debt forces the firm to refinance more frequently, thus absorbing shocks quicker and intensifying volatility (He and Xiong, 2012; Huang and Shang, 2019; Chen et al., 2021).

Second, CEOs can increase firm risk by undertaking risky projects like R&D investments. Due to the long-term nature of R&D, future earnings from these activities tend to exhibit high volatility (Kothari et al., 2002). Moreover, R&D investments are intangible assets with low collateral value (Kothari et al., 2002), likely to be suspended, subject firms to higher financial constraints, and increase firm risk (Li, 2011). Consistent with this perspective, Opler and Titman (1994) posit that

R&D-intensive firms have higher financial distress risk because of more differentiated products, greater agency problems, and higher growth rates.

Collectively, if CSR contracting moderates the extreme levels of managerial decisions, incentivised CEOs should adopt more conservative corporate policies. The above theoretical and empirical evidence suggests that incentivised CEOs would reduce firm leverage and R&D investments. Therefore, we formulate the following hypotheses.

Hypothesis 2: CSR contracting reduces firm leverage.

Hypothesis 3: CSR contracting reduces R&D investments.

4.3. Data sample and descriptive statistics

In this section, we describe the data sample, including the sample size and the observation window, used in our baseline regressions, robustness checks, and other analyses. The construction of measures of firm risk and CSR contracting is also discussed. Then, we provide details about the baseline specification, summary statistics, and a correlation matrix between variables.

4.3.1. Sample selection

Applying a similar approach to Chapter 3, we utilise the CSR contracting dataset constructed manually from firms' proxy statements (Form DEF 14A). As discussed in Section 1.4 of Chapter 1, we are interested in the "Compensation Discussion and Analysis" section, which details top executives' performance criteria, targets, and actual performance. Following the strategy of Flammer et al. (2019) and Qin and Yang (2022), our data sample focuses on the largest 500 US companies by capitalisation, which constitute the Standard and Poor's (S&P) 500 index. This data collection strategy keeps our data collection process manageable, while ensuring the generalisability of our results. We begin our sample period from 2000 to avoid the impacts of data issues associated with pre-2000 proxy statements in SEC's EDGAR.[37] We end our sample period

[37] We find a large number of missing values (exceeding 10%) for CSR contracting variables before 2000, which is attributed to the challenges of accessing and collecting pre-2000 proxy statement data from SEC's EDGAR platform.

in 2018 because the occurrence and spread of the COVID-19 pandemic (from 2019 to 2023) may confound the potential effects of CSR contracting on firm risk.

Next, we supplement our hand-collected data with additional data from other databases. Specifically, we use stock data, such as stock prices, CRSP market index returns, and the number of shares outstanding, from the CRSP database. The accounting data comes from the Compustat database. The data of CEOs and directors comes from IRRC/Riskmetrics and ExecuComp.[38] We drop all observations with missing values for variables included in the baseline specifications, while removing observations with invalid values, such as negative total book assets and negative firm sales. To reduce the potential impacts of outliers, all control variables are winsorized at the 1st and 99th percentiles. After applying all these conditions, our final sample consists of 7188 firm-year observations, in which 1933 firm-year observations have connections with CSR contracting provisions. This sample size is consistent with the sample used in Flammer et al. (2019).

4.3.2. Variable construction and empirical specification

4.3.2.1. CSR contracting

As discussed in Section 1.4 of Chapter 1, we follow Flammer et al. (2019) and consider a firm to have CSR contracting if at least one of the following performance criteria is included in CEO compensation contracts. Specifically, the performance criteria include "Community, Compliance with ethical standards, CSR, Diversity, Employee well-being, Energy efficiency, Environmental compliance, Environmental goals, Environmental projects, Greenhouse gas emissions reductions, Health, Performance relative to a corporate responsibility index, Product safety, Reduce injury rates, Safety, and Sustainability" (Flammer et al., 2019, p.1105). Then, we construct an indicator variable, *CSR contracting,* which equals one if a firm integrates at least one of the listed CSR criteria in CEO contracts, and zero otherwise.

Nevertheless, as discussed in Flammer et al. (2019), firms may also apply CSR contracting for a symbolic reason, wherein CSR criteria are integrated into CEO compensation but carry minimal

[38] CEO compensation data comes from ExecuComp. Meanwhile, other CEO and director characteristics (e.g., CEO-Chairman duality, board size) come from ISS Governance and ISS Governance Legacy services. The data were initially provided by RiskMetrics, which was acquired by ISS in 2005.

weight, resulting in a limited impact on managerial risk-taking. In other words, using a binary variable *CSR contracting* may not be able to fully describe the moderating effect of CSR contracting, and any subsequent conclusions may be biased. In this vein, having an additional, continuous measure of CSR contracting improves the reliability of our results, compared to a single-measure research setting. Thus, we construct a second explanatory variable that describes the substantiveness of CSR contracting in relation to the total CEO compensation. Accordingly, we construct *% CSR contracting,* which is the ratio of CSR-based compensation to total CEO compensation. For firms that adopt CSR contracting but do not specify the percentage of CSR contracting, we note the corresponding *% CSR contracting* values as null. For firms that do not adopt CSR contracting, the corresponding *% CSR contracting* values are zero. After this process, our sample decreases to 5873 firm-year observations when we use *% CSR contracting* as the main regressor.

4.3.2.2. Corporate risk-taking

Following prior literature (e.g., Coles et al., 2006; Bernile et al., 2018; Chen et al., 2022), we use stock return volatility to measure firm risk, where higher stock return volatility indicates a higher level of corporate risk-taking. To the extent that the market is efficient and all information about firms, including their engagement in risky projects, should be conveyed to the market, such information would be quickly reflected in the stock price and impact stock returns (Do et al., 2022). We construct *Return volatility,* which is the annualised standard deviation of daily stock returns. In the robustness checks in Section 4.2, we demonstrate that our results remain unchanged when we use alternative measures of firm risk, including the implied volatility of at-the-money (ATM) options with 30 days to expiration and the 4-year standard deviation of ROA. Having multiple measures of firm risk improves the quality of our analyses for two reasons. First, realised and implied volatility serve as complementary measures of corporate risk-taking, encompassing the historical and the market's current expectation of firm risk (Canina and Figlewski, 1993). Using multiple firm risk measures, thus, provides a complete picture of corporate risk profiles in which different levels of CEOs' aggressiveness are reflected. Second, using both realised and

implied volatility in robustness checks alleviates the concerns that our empirical results are spurious and driven by the choice of dependent variables.

Further, to enhance our analysis, we also observe other important indicators of corporate risk-taking policies. These indicators include R&D spending and the level of leverage, which serve as proxies for assessing the riskiness of investment and financial policies, respectively (Coles et al., 2006).

4.3.3. Empirical specification

To examine the effects of CSR contracting provisions on firm risk, we estimate the following panel regression model:

$$Firm\ risk_{i,t} = \beta \times CSR\ contracting_{i,t-1} + \gamma X_{i,t-1} + Firm_i + Year_t + \epsilon_{i,t} \quad (1)$$

The measure of firm risk is *Return volatility* in the baseline analysis, while other measures are used for robustness checks in Section 4.2. As discussed in the previous subsection, we measure CSR contracting using *CSR contracting* and *% CSR contracting*. *X* is a vector of control variables, including firm-level, CEO, and board characteristics. $Firm_i$ and $Year_t$ are firm fixed effects and year fixed effects, respectively. ϵ is the error term. To account for the possible dependence across firm-year observations of the same firms, we cluster all standard errors at the firm level.

The baseline analysis incorporates control variables and fixed effects to mitigate concerns about omitted variables that are correlated with CSR contracting and exhibit variation within firms. Specifically, firm-fixed effects are included to mitigate unobserved, persistent firm-level heterogeneity. In addition, including year-fixed effects accounts for important macroeconomic factors that may influence both the adoption of CSR pay and firm outcomes. For instance, firms with higher leverage ratios often encounter limitations and restrictions imposed by debt holders, leading them to prioritise short-term financial targets over stakeholder engagements. As a result, firms with high leverage are less inclined to adopt CSR contracting. Simultaneously, these firms experience a higher risk of financial distress due to the substantial debt payment obligations. Similarly, firms are more likely to adopt CSR contracting during economic expansion periods

because they can generate more financial resources to spend on CSR investments, while maintaining low-risk profiles.

Regarding a set of control variables, we control for factors that may potentially affect firms' volatility. Specifically, we use *Leverage*, which is the sum of debts in current liabilities and long-term debts, scaled by total book assets. *Ln(TA)* is the natural logarithm of total book assets. *Cash/TA* is the value of cash and marketable securities, scaled by total book assets. *Dividend yield* is the dividend per share, scaled by the stock price at the end of the fiscal year. *CEO chairman* is an indicator variable that equals one if a CEO is also the board's chairman, and zero otherwise. *Ln(Board size)* is the natural logarithm of the total number of directors on the board. *Ln(Total pay)* is the natural logarithm of CEO total compensation, that includes salary, bonus, annual and long-term incentive plans, and other benefits. *Ln(Director age)* is the natural logarithm of the average age of directors on the board. By controlling for these factors, we reduce the possibility that omitted factors drive our empirical findings. Definitions of all dependent and independent variables are provided in the "Definitions of variables" section.

4.3.4. Summary statistics

Panel A of Table 4.1 presents summary statistics for variables used in our baseline analysis. For the full sample, the average *Return volatility* for a fiscal year is 0.311. Our analysis reveals that 26.9% of the firm-year observations in our sample are associated with CSR contracting provisions. The average total book assets of firms is 55.826 billion dollars, while CEOs receive an average annual compensation of 10.649 million dollars.

To gain further insight into the adoption of CSR contracting, in Panel B of Table 4.1, we present the means and standard deviations of *Return volatility* and firm-level characteristics for two subsamples of firms without and with CSR contracting. There are 5255 firm-year observations without CSR contracting and 1933 firm-year observations with CSR contracting. Accordingly, for the subsample of firms with CSR contracting, CSR-based compensation accounts for 3.2% of the total CEO compensation, on average, and this variable's standard deviation is relatively large, compared to its level (2.8%). These statistics of CSR-based compensation are largely consistent

with those reported by Flammer et al. (2019) and Qin and Yang (2022). Interestingly, both the level and the standard deviation of *Return volatility* of firms adopting CSR contracting are statistically smaller than that of firms without CSR contracting. These statistics support our hypothesis that firms with CSR contracting exhibit lower stock return volatility.

As for other firm characteristics, firms adopting CSR contracting have larger total assets (66.95 billion dollars versus 51.73 billion dollars), have higher leverage ratio (0.287 versus 0.244), hold less cash (measured by *Cash/TA*, 0.097 versus 0.141), pay higher dividends (measured by *Dividend yield*, 0.023 versus 0.016). CEOs in firms with CSR contracting receive higher compensation (12.093 million dollars versus 10.118 million dollars) and are less likely to be the board's chairman. Furthermore, firms with CSR contracting have larger boards and a higher average director age. Additionally, Panel C of Table 4.2 reports the pairwise correlation coefficients between the variables used in our baseline analysis. The reported correlation coefficients are relatively small, all below 0.5, indicating no significant concern for multicollinearity.

Table 4.1. Descriptive statistics

This table provides summary statistics for variables included in the baseline regression. The data sample consists of S&P 500 firms from 2000 to 2018. Panel A provides basic statistics for all variables in the full sample. Panel B provides basic statistics, including means and standard deviations, of measures of firm risk, CSR contracting, and control variables for two sub-samples of firms without and with CSR contracting (i.e., *CSR contracting* = 0 and *CSR contracting* = 1). Except for *Return volatility*, all other variables' one-year lagged statistics are reported to be consistent with the baseline specification. We compare summary statistics between two sub-samples by taking the differences between values and providing corresponding t-statistics. Panel C reports Pearson correlation coefficients between variables. All variables are defined in the "Definitions of variables" section.

Panel A. Summary statistics for the full sample

Variables	N	Mean	Std. dev.	p5	Median	p95
Return volatility	7,188	0.311	0.164	0.147	0.266	0.644
CSR contracting	7,188	0.269	0.443	0	0	1
% CSR contracting	5,873	0.003	0.013	0	0	0.026
Leverage	7,188	0.256	0.169	0	0.242	0.559
TA (million $)	7,188	55,826.14	186,490.82	2,069.07	14,202.50	195,014.00
Cash/TA	7,188	0.129	0.14	0.006	0.076	0.447
Dividend yield	7,188	0.018	0.017	0	0.016	0.048
Total pay (thousand $)	7,188	10,649.73	12,510.92	1,813.78	8,489.02	24,497.95
CEO chairman	7,188	0.682	0.466	0	1	1
Board size	7,188	10.808	2.46	7	11	15
Director age	7,188	61.816	4.002	56.091	62	67.111

Panel B. Summary statistics for sub-sample of firms with and without CSR contracting

Variables	Without CSR contracting		With CSR contracting		Differences in means
	N = 5255		N = 1933		
	Mean	Std. dev.	Mean	Std. dev.	
Return volatility	0.323	0.17	0.279	0.142	0.050***
% CSR compensation	0	0	0.032	0.028	-0.032***
Leverage	0.244	0.173	0.287	0.152	-0.043***

(continues)

(continued)

Variables	Without CSR contracting		With CSR contracting		Differences in means
	N = 5255		N = 1933		
	Mean	Std. dev.	Mean	Std. dev.	
TA (million $)	51734.2	180647.1	66950.36	201151.66	-15216.155***
Cash/TA	0.141	0.146	0.097	0.114	0.044***
Dividend yield	0.016	0.016	0.023	0.017	-0.007***
Total pay (thousand $)	10118.5	12583.74	12093.92	12197.564	-1975.411***
CEO chairman	0.695	0.46	0.645	0.479	0.050***
Board size	10.691	2.615	11.127	1.945	-0.436***
Director age	61.506	4.3	62.66	2.886	-1.154***

Panel C. Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) CSR compensation	1									
(2) % CSR compensation	0.739	1								
(3) Leverage	0.112	0.082	1							
(4) TA	0.036	0.000	-0.006	1						
(5) Cash/TA	-0.138	-0.079	-0.281	-0.004	1					
(6) Dividend yield	0.176	0.115	0.266	0.062	-0.291	1				
(7) Total pay	0.07	0.022	-0.004	0.12	0.076	-0.061	1			
(8) CEO chairman	-0.048	-0.05	0.000	0.064	-0.12	0.065	0.05	1		
(9) Board size	0.079	0.027	0.028	0.219	-0.258	0.254	0.053	0.083	1	
(10) Director age	0.128	0.091	0.089	0.079	-0.1	0.124	0.005	-0.066	0.075	1

4.4. Baseline results and robustness checks

4.4.1 Baseline results

In this section, we formally test the relationship between CSR contracting and firm risk. We estimate the equation (1) using the fixed effects regression. Table 4.2 reports the regression results. Specifically, we regress *Return volatility* on measures of CSR contracting, while controlling for other firm-specific variables, as discussed in Section 4.3.3. Column 1 reports the regression results using *CSR contracting* as the main regressor. Column 2 reports the regression results using *% CSR contracting* as the main regressor. We consistently find that the coefficients of CSR contracting measures are negative and significant at the 5% level. These results suggest that firms adopting CSR contracting experience a lower level of corporate risk-taking than firms without this provision. More importantly, the impact of CSR contracting is economically significant. Accordingly, the coefficient of *CSR contracting* is -0.012, meaning that the introduction of CSR metrics in CEO compensation reduces *Return volatility* by 0.012. Given that the average *Return volatility* of firms in our sample is 0.311, this reduction is equivalent to a 3.9% decrease in firm risk. The coefficient of *% CSR contracting* is -0.515, meaning that a one percent increase in the share of CSR contracting would, all else being equal, lead to an average reduction in *Return volatility* by 0.515%.

In addition, the coefficients of other explanatory variables are largely consistent in signs, magnitude, and significance across regressions and consistent with prior research findings. Regarding firm policies, higher dividend yield and leverage are associated with higher firm risk. Although higher dividend payment reduces cash balance that CEOs can invest in value-destroying projects (Easterbrook, 1984; Jensen, 1986), aggressive dividend policy increases refinancing risk because firms have to commit to paying dividends regularly and rely more on expensive external financing to fund investments and operational activities (Jagannathan et al., 2000; Daniel et al., 2010; Harford et al., 2014). Consistent with Ben-Zion and Shalit (1975), leverage is positively and significantly associated with firm risk. However, the coefficient of cash reserves is positive and contradicts the findings of previous studies that cash reserves act as a buffer against volatility. One possible explanation is that firms hoard cash in response to the expected increase in cash

flow volatility, leading to a positive association between the cash-to-assets ratio and short-term future volatility. This result is consistent with the precautionary motive of cash holdings (Han and Qiu, 2007) and aligns with the result reported by Bernile et al. (2018). Meanwhile, the signs and significance of governance variables, such as CEO chair, board size, and director age, are in line with Bernile et al. (2018). Collectively, the baseline results reported in Table 4.2 lend support to our main hypothesis that CSR contracting provisions reduce the level of managerial risk-taking.

Table 4.2. CSR contracting and firm risk

This table examines whether CSR contracting affects corporate risk-taking by using fixed effects regressions. The dependent variable is *Return volatility,* which is the annualised standard deviation of daily stock returns. The main explanatory variables are *CSR contracting* and *% CSR contracting*. *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. Firm- and year-fixed effects are included in all regressions. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of variables" section.

	Dependent: Return volatility	
Variables	(1)	(2)
CSR contracting$_{t-1}$	-0.012**	
	(-2.013)	
% CSR contracting$_{t-1}$		-0.515**
		(-2.345)
Leverage$_{t-1}$	0.006	0.003
	(0.223)	(0.11)
Ln(TA)$_{t-1}$	0.015**	0.019**
	(2.006)	(2.198)
Cash/TA$_{t-1}$	0.063*	0.053
	(1.894)	(1.433)
Dividend yield$_{t-1}$	1.124***	1.275***
	(4.875)	(4.796)
Ln(Total compensation)$_{t-1}$	0.004	0.007*
	(1.099)	(1.927)
CEO chair$_{t-1}$	-0.004	-0.001
	(-0.796)	(-0.104)
Ln(Board size)$_{t-1}$	-0.036**	-0.051***
	(-2.288)	(-2.900)
Ln(Director age)$_{t-1}$	-0.240***	-0.287***
	(-4.065)	(-4.253)
N	7,188	5,873

(continues)

(continued)

	Dependent: Return volatility	
Variables	(1)	(2)
Adj. R-squared	0.442	0.452
Firm FE	Yes	Yes
Year FE	Yes	Yes

4.4.2. Robustness checks

In this section, we implement a series of robustness checks to enhance the reliability of our baseline findings. In the first robustness test, we re-examine the relationship between CSR contracting and corporate risk-taking using alternative measures constructed from different databases. The first alternative measure is *ROA volatility*, which is the annualised standard deviation of quarterly ROAs over the last four quarters of a fiscal year.[39] This measure is constructed using the Compustat database. The second measure of firm risk is *Implied volatility*. Following An et al. (2014) and Kelly et al. (2016), we use the implied volatility of at-the-money (ATM) options with 30 days to expiration. The implied volatility data is obtained from Ivy DB OptionMetrics – Option Prices database. The Option Prices database calculates implied volatility using the Cox-Ross-Rubinstein (CRR) binomial tree model, where implied volatility is computed by iteratively running the model until the option price matches its market price, which is the midpoint of the option's best bid and ask prices. Following Kelly et al. (2016), we define ATM options as options that have the absolute values of delta between 0.4 and 0.5 (the absolute term is to cover both call and put options). We then calculate the annual implied volatilities by averaging the monthly implied volatilities of both call and put options.

In Panel A of Table 4.3, we re-estimate equation (1) by regressing these alternative measures of firm risk on CSR contracting measures and other control variables as included in the baseline analysis. The coefficients of *CSR contracting* and *% CSR contracting* are negative and significant,

[39] The results remain significant if we use the annualised standard deviation of quarterly ROAs over the last three or five quarters.

suggesting that the observed moderating effect of CSR contracting on risk-taking is not likely to be influenced by our choice of firm risk measures.

Second, it is crucial to examine the potential influence of the observation window on our findings. One may argue that the observed moderating effect of CSR contracting is influenced by the 2007 – 2009 financial crisis, which significantly impacted stock return volatility and firms' executive compensation designs. In this sense, the relationship between CSR contracting and firm risk may not be significant for other periods. To alleviate this concern, in Panel B of Table 4.3, we replicate our baseline regressions without using firm-year observations associated with the 2007 – 2009 financial crisis. The results show that the coefficients of *CSR contracting* (Column 1) and *% CSR contracting* (Column 2) are negative and significant at the 5% level. This finding lends support to the notion that our baseline findings are not sensitive to the choice of observation window.

Third, to address the concern that our results may be influenced by unobserved factors coinciding with the use of CSR contracting, we implement a falsification test. The rationale behind this test is as follows: If we randomly assign CSR contracting values to observations which originally adopt CSR contracting differently, and if the coefficients of CSR contracting remain negatively significant, it suggests that the presence of unobserved factors affects our baseline results. To implement this test, we construct two pseudo measures of CSR contracting corresponding to *CSR contracting* and *% CSR contracting.* We then examine whether these pseudo measures have a significant and negative relationship with *Return volatility.* The first variable, *Pseudo CSR contracting*, is constructed by randomly assigning 1933 firm-year observations (which may originally adopt or not adopt CSR contracting) with CSR contracting values equal to 1, while the remaining observations are assigned CSR contracting values of 0.[40] The second variable, *Pseudo % CSR contracting*, is constructed by reallocating the initial *% CSR contracting* values between observations of the group having CSR contracting. Let us consider a simple example of the construction of *Pseudo % CSR contracting*. Both firm A and firm B adopt CSR contracting. Initially, Firm A has a *% CSR contracting* value of 10%, and Firm B has a *% CSR contracting*

[40] 1933 is the number of firm-year observations connected to CSR contracting in our baseline sample, as reported in Section 4.3 and Table 4.1.

value of 1%. After the reallocation, Firm A would have a *Pseudo % CSR contracting* value of 1%, while Firm B would have a *Pseudo % CSR contracting* value of 10%. Observations belonging to the group of firms without CSR contracting (originally) are assigned a *Pseudo % CSR contracting* value of 0. All missing values are excluded from this analysis.

In Panel C of Table 4.3, we re-estimate the equation (1) by regressing *Return volatility* on two pseudo measures. The results show that the coefficients of *Pseudo CSR contracting* and *Pseudo % CSR contracting* are insignificant in all regressions. These results lend support to the notion that our baseline findings are not affected by unobserved differences between firms with and without CSR contracting. More importantly, the results suggest that the substantiveness of CSR contracting and the binary measure of its presence play a crucial role in explaining stock return volatility.

In this section's last analysis, we check the reliability of our findings by controlling for additional factors that may influence CEOs' risk-taking. Specifically, the sensitivity of CEOs' wealth to stock price and stock price volatility (i.e., delta and vega) may affect managerial risk-taking (e.g., Coles et al., 2006). We re-estimate equation (1) while controlling for delta and vega. We construct *Ln(1 + Delta)* as the natural logarithm of one plus CEO delta, where CEO delta indicates the sensitivity of a CEO's wealth to a 1% change in the firm's stock price. We construct *Ln(1 + Vega)* as the natural logarithm of one plus CEO vega, where CEO vega indicates the sensitivity of a CEO's wealth to a 0.01 increase in the firm's stock price volatility. We report the regression results in Panel D of Table 4.3. The coefficients of both measures of CSR contracting remain negative and significant at the 5% level, thus strengthening our baseline findings.

Table 4.3. Robustness checks

This table reports the results of four robustness checks of the relationship between CSR contracting and corporate risk-taking, including the tests using alternative measures of firm risk (Panel A), excluding observations relating to the 2007-2009 financial crisis (Panel B), falsification test (Panel C) and controlling for CEO vega and delta (Panel D). The same control variables and fixed effects as in the baseline regression (Table 4.2) are included. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of variables" section.

Panel A. Alternative measures of firm risk

	Dependent: Implied volatility		*Dependent: ROA volatility*	
Variables	(1)	(2)	(3)	(4)
CSR contracting$_{t-1}$	-0.009*		-0.272*	
	(-1.65)		(-1.760)	
% CSR contracting$_{t-1}$		-0.427**		-2.943*
		(-2.072)		(-1.887)
Leverage$_{t-1}$	0.007	0.005	1.927**	1.955**
	(0.280)	(0.170)	(2.459)	(2.153)
Ln(TA)$_{t-1}$	0.012	0.016*	-0.316**	-0.375**
	(1.562)	(1.797)	(-2.172)	(-2.205)
Cash/TA$_{t-1}$	0.063*	0.074**	0.983*	0.884*
	(1.828)	(1.983)	(1.940)	(1.788)
Dividend yield$_{t-1}$	0.480**	0.603***	14.806*	17.234
	(2.388)	(2.699)	(1.652)	(1.528)
Ln(Total compensation)$_{t-1}$	0.001	0.005	0.019	0.008
	(0.403)	(1.273)	(0.330)	(0.115)
CEO chair$_{t-1}$	-0.003	0.000	0.097	0.065
	(-0.598)	(0.015)	(0.930)	(0.646)
Ln(Board size)$_{t-1}$	-0.027*	-0.032*	0.572	0.473
	(-1.808)	(-1.942)	(1.548)	(1.137)
Ln(Director age)$_{t-1}$	-0.202***	-0.257***	-0.311	0.081
	(-3.448)	(-3.743)	(-0.259)	(0.058)
N	6,863	5,590	7,171	5,853
Adj. R-squared	0.405	0.412	0.012	0.012
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Panel B. Excluding the 2007-2009 crisis period

	Dependent: Return volatility	
Variables	(1)	(2)
CSR contracting$_{t-1}$	-0.012**	
	(-2.088)	
% CSR contracting$_{t-1}$		-0.678**
		(-2.438)
Leverage$_{t-1}$	-0.024	-0.022
	(-0.983)	(-0.738)
Ln(TA)$_{t-1}$	0.008	0.010
	(1.120)	(1.205)

(continues)

(continued)

	Dependent: Return volatility	
Variables	(1)	(2)
$Cash/TA_{t-1}$	0.029	0.011
	(0.926)	(0.310)
$Dividend\ yield_{t-1}$	-0.245	-0.308
	(-1.070)	(-1.141)
$Ln(Total\ compensation)_{t-1}$	0.006*	0.009**
	(1.755)	(2.273)
$CEO\ chair_{t-1}$	-0.003	0.000
	(-0.699)	(0.089)
$Ln(Board\ size)_{t-1}$	-0.041***	-0.048***
	(-2.755)	(-2.959)
$Ln(Director\ age)_{t-1}$	-0.201***	-0.253***
	(-3.482)	(-3.862)
N	6,235	5,093
Adj. R-squared	0.336	0.348
Firm FE	YES	YES
Year FE	YES	YES

Panel C. Falsification test

	Dependent: Return volatility	
Variables	(1)	(2)
$Pseudo\ CSR\ contracting_{t-1}$	-0.000	
	(-0.01)	
$Pseudo\ \%\ CSR\ contracting_{t-1}$		-0.188
		(-0.91)
$Leverage_{t-1}$	0.007	0.004
	(0.28)	(0.12)
$Ln(TA)_{t-1}$	0.015**	0.019**
	(2.01)	(2.23)
$Cash/TA_{t-1}$	0.064*	0.055
	(1.92)	(1.49)
$Dividend\ yield_{t-1}$	1.111***	1.271***
	(4.85)	(4.79)
Ln(Total compensation)t-1	0.004	0.007*
	(1.05)	(1.87)
$CEO\ chair_{t-1}$	-0.004	-0.001
	(-0.74)	(-0.09)
$Ln(Board\ size)_{t-1}$	-0.036**	-0.051***
	(-2.25)	(-2.99)

(continues)

(continued)

	Dependent: Return volatility	
Variables	(1)	(2)
Ln(Director age)$_{t-1}$	-0.237***	-0.286***
	(-3.98)	(-4.23)
N	7,188	5,873
Adj. R-squared	0.44	0.45
Firm FE	YES	YES
Year FE	YES	YES

Panel D. Controlling for CEO delta and vega

	Dependent: Return volatility	
Variables	(1)	(2)
CSR contracting$_{t-1}$	-0.013**	
	(-2.044)	
%CSR contracting$_{t-1}$		-0.437**
		(-2.175)
Leverage$_{t-1}$	0.004	0.002
	(0.136)	(0.064)
Ln(TA)$_{t-1}$	0.020**	0.024***
	(2.565)	(2.714)
Cash/TA$_{t-1}$	0.069**	0.060
	(2.025)	(1.589)
Dividend yield$_{t-1}$	1.184***	1.367***
	(4.720)	(4.740)
Ln(Total compensation)t-1	0.005	0.009**
	(1.163)	(1.981)
CEO chair$_{t-1}$	-0.003	0.001
	(-0.617)	(0.106)
Ln(Board size)$_{t-1}$	-0.038**	-0.053***
	(-2.298)	(-2.952)
Ln(Director age)$_{t-1}$	-0.238***	-0.293***
	(-3.758)	(-4.161)
Ln(1 + Vega)$_{t-1}$	-0.000*	-0.000*
	(-1.780)	(-1.830)
Ln(1 + Delta)$_{t-1}$	0.000*	0.000*
	(1.840)	(1.892)
N	6,573	5,366
Adj. R-squared	0.440	0.449
Firm FE	Yes	Yes
Year FE	Yes	Yes

4.4.3. Cross-sectional heterogeneity in the effect of CSR contracting on firm risk

Our central interpretation of the impact of CSR contracting on firm risk is that incentivised CEOs would have stronger incentives to consider stakeholders' interests in their agenda. As discussed in Section 2, stakeholders are illiquid claimants of firms, and their claims depend on the sustainable performance of those firms. Because of the illiquid affiliations with firms, stakeholders cannot unwind their investments quickly, making them vulnerable to financial constraints. In this vein, CEOs with CSR contracting should adopt a more prudent management approach to align firm risk with the risk preferences of stakeholders. If this argument is valid, it leads to two related predictions that have not yet been tested.

First, the benefits of having CSR contracting should increase if the threats to stakeholders' claims are more substantial. Prior studies suggest that a major source of threats to stakeholders is financial constraints, in which CEOs have insufficient financial resources to engage with stakeholders, thereby reneging on stakeholders' claims such as workplace safety and environmental compliance (e.g., Cohn and Wardlaw, 2016; Xu and Kim, 2022). Further, financial constraints can aggravate the risk-shifting problem, in which firms focused on shareholder interests may increase the riskiness of their assets by sacrificing stakeholder value (Jensen and Meckling, 1976). In this context, if firms are highly financially constrained, the presence of CSR contracting becomes more important as a protective shield for safeguarding stakeholder interests. In other words, we conjecture that the adverse impact of CSR contracting on corporate risk-taking should be more pronounced when financial constraints escalate.

To test this conjecture, we re-estimate the equation (1) and include measures of financial constraints as an explanatory variable. Following the literature, we measure the degree of financial constraints by *KZ index*, which is constructed by Kaplan and Zingales (1997), and *SA index*, which is constructed by Hadlock and Pierce (2010).[41] Firms are more financially constrained if *KZ index*

[41] Following Kaplan and Zingales (1997), *KZ index* is constructed as -1.002*CF/TA* - 39.368*DIV/TA* - 1.315*CA/TA* + 3.129*LEV* + 0.283*Q*, where *CF/TA* is the ratio of cash flow to lagged total book assets, *DIV/TA* is the ratio of cash dividends to lagged total book assets, *CA/TA* is the ratio of cash balance to lagged total book assets, *LEV* is the ratio of total debts to total book assets, and *Q* is the ratio of the market value of assets to total book assets.

and *SA index* are higher. To estimate the cross-sectional heterogeneity in the effect of CSR contracting due to financial constraints, we focus on the coefficients of the interaction terms between measures of CSR contracting and measures of financial constraints. If CSR contracting becomes more essential to protect stakeholders' interests, the coefficients of the interaction terms should be negative and significant. The regression results for *Return volatility* and the variables of interest are presented in Panel A of Table 4.4. We find that the coefficients of the interaction terms are negative and significant in almost all regressions, which is consistent with our conjecture. This finding lends support to the notion that as threats to stakeholders' claims become more pronounced, the influence of CSR contracting on firm risk should increase proportionally to offset the heightened vulnerability of stakeholders.

The second implication of the baseline relationship is that CSR contracting should be more effective in reducing managerial risk-taking if CEOs consider stakeholder engagements authentic and necessary activities for building sustainable relationships with stakeholders. One factor that may influence this managerial perspective is social capital. Accordingly, individuals and organisations tend to be influenced and follow the social norms and the associational networks where they reside. There is evidence that some components of social capital, such as cooperative norms and personal relationships, prevent individuals from engaging in opportunistic activities that generate negative outcomes for the community (Hasan et al., 2017; Hoi et al., 2019). In addition, CEOs in cooperative communities can face high social sanctions, such as ostracism and stigmatisation, that damage CEOs' reputations if they behave irresponsibly (Hilary and Hui, 2009). Moreover, because high-social-capital communities can provide firms with stronger protection in economic downturns where mutual trust is eroded (Lins et al., 2017), the need to engage with stakeholders becomes more genuine. In this vein, if incentivised CEOs reside in the local areas with high levels of social capital, they are less likely to spend little effort on CSR activities just for window-dressing purposes (i.e., engaging in CSR activities to superficially enhance the public images of firms without providing any meaningful contributions to

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Following Hadlock and Pierce (2010), *SA index* is constructed as $-0.737Size + 0.043Size^2 - 0.040Age$, where *Size* is the natural logarithm of Min(Total book assets, 4.5 billion dollars) and *Age* is Min(The number of years the firm is listed with a non-missing stock price on Compustat, 37 years).

stakeholders). Collectively, we conjecture that firms with headquarters in areas having higher levels of social capital would exhibit a more substantial reduction in stock return volatility if they adopt CSR contracting.

To test this conjecture, we construct a measure of social capital of the areas in which firms place headquarters, based on US counties' cooperative norms and social networks. These traits are captured and described in the data developed by the Northeast Regional Center for Rural Development (NERCRD) of the Pennsylvania State University.[42] The data focuses on four main aspects of each county's society, including the voter turnout rate in the presidential elections for the population age 18 and over (variable "*PVOTE*"), the US census surveys' response rates (variable "*RESPN*"), the population-adjusted number of 10 different types of social organisations (variable "*ASSN*"), and the population-adjusted number of non-profit organisations without those with an international approach (variable "*NCCS*").[43]

Following Rupasingha et al. (2006), Hasan et al. (2017), and Hoi et al. (2019), we construct a variable *Social capital* by extracting the first principal component of the principal component analysis based on four factors *PVOTE*, *RESPN*, *ASSN*, and *NCCS*. The analysis is implemented for each year in 1990, 1997, 2005, 2009, and 2014, and the corresponding first principal component, interpreted as the social capital index, is extracted. As described in Rupasingha et al. (2006), the higher value of this index indicates a higher level of county-level social capital. Nevertheless, the index data for other years is missing. To solve this issue, we follow Hilary and Hui (2009) and Hoi et al. (2019) to backfill missing data using available preceding data. For instance, missing observations from 2006 to 2008 are backfilled by the corresponding

[42] The data is recorded for 1990, 1997, 2005, 2009, and 2014. However, NERCRD has no plan to update this data in the future. The data is available at https://aese.psu.edu/nercrd/community/social-capital-resources

[43] Rupasingha et al. (2006) provide details of each factor as follows. They consider the distribution of social and political organisations per 10,000 people at the county level to capture the strength of civic engagement in this county. The *ASSN* variable describes this aspect based on the aggregation of the number of 10 establishment types, including (a) religious organisations, (b) civic and social associations, (c) business associations, (d) political organisations, (e) professional organisations, (f) labour organisations, (g) bowling centres, (h) fitness and recreational sports centres, (i) golf courses and country clubs, and (j) sport teams and clubs. *NCCS* variable describes the strength of social interactions through the distribution of non-profit organisations per 10,000 people. Rupasingha et al. (2006) also use the voter turnouts in the presidential elections (*PVOTE*) and the response rates in US census surveys (*RESPN*) that capture the county-level cooperative norms.

observations in 2005. Since there has been no update of the social capital data since 2014, we backfill data from 2015 to 2018 using the 2014 data, after considering that the 2015-2018 window is comparable to the four-year gap between 2009 and 2013.[44]

Panel B of Table 4.4 reports the regression results of *Return volatility* on CSR contracting measures, *Social capital*, and the interaction terms between CSR contracting measures and *Social capital*. Consistent with our conjecture, we find that the coefficients of the interaction terms are negative and significant in all regressions, meaning that the moderating effect of CSR contracting is more pronounced for firms incorporated in US counties with higher levels of social capital. Taken together, this finding strengthens our argument that the decline in firm risk can be attributed to stakeholder-oriented incentives.

Table 4.4. Cross-sectional heterogeneity in the risk-reduction effect of CSR contracting

This table examines the cross-sectional heterogeneity in the effect of CSR contracting on firm risk, using fixed effects regressions. The dependent variable is *Return volatility,* which is the annualised standard deviation of daily stock returns. The main explanatory variables are *CSR contracting* and *% CSR contracting*. *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. To measure financial constraints, we use the *KZ index*, constructed by Kaplan and Zingales (1997), and *SA index*, constructed by Hadlock and Pierce (2010). We construct *Social capital* by extracting the first principal component of the principal component analysis based on four factors, *PVOTE*, *RESPN*, *ASSN*, and *NCCS*, with the data provided by the Northeast Regional Center for Rural Development (NERCRD) of the Pennsylvania State University. Firm- and year-fixed effects are included in all regressions. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of variables" section.

Panel A. Financial constraints and the effect of CSR contracting on firm risk

	Dependent: Return volatility			
Variables	(1)	(2)	(3)	(4)
CSR contracting$_{t-1}$	-0.008		-0.117***	
	(-1.230)		(-2.664)	
% CSR contracting$_{t-1}$		-0.267		-1.561
		(-1.530)		(-1.063)
KZ index$_{t-1}$	0.041***	0.042***		
	(5.565)	(5.073)		

(continues)

[44] The mean and standard deviation of the social capital index for our sample are 0.12 and 0.943, respectively. These statistics are comparable in level with the mean (-0.4408) and the standard deviation (0.8339) reported by Hoi et al. (2019)

(continued)

	Dependent: Return volatility			
Variables	(1)	(2)	(3)	(4)
CSR contracting$_{t-1}$ x KZ index$_{t-1}$	-0.011*			
	(-1.875)			
% CSR contracting$_{t-1}$ x KZ index$_{t-1}$		-0.152*		
		(-1.894)		
SA index$_{t-1}$			0.139***	0.131**
			(2.995)	(2.292)
CSR contracting$_{t-1}$ x SA index$_{t-1}$			-0.023**	
			(-2.514)	
% CSR contracting$_{t-1}$ x SA index$_{t-1}$				-0.223
				(-0.666)
Leverage$_{t-1}$	-0.105***	-0.114***	0.011	0.009
	(-3.138)	(-2.868)	(0.403)	(0.294)
Ln(TA)$_{t-1}$	0.008	0.013	0.003	0.007
	(1.035)	(1.501)	(0.422)	(0.770)
Cash/TA$_{t-1}$	0.112***	0.109***	0.067**	0.056
	(3.198)	(2.837)	(2.009)	(1.518)
Dividend yield$_{t-1}$	2.107***	2.294***	1.142***	1.270***
	(6.373)	(5.868)	(4.959)	(4.770)
Ln(Total compensation)$_{t-1}$	0.006	0.010**	0.005	0.008**
	(1.607)	(2.573)	(1.269)	(2.008)
CEO chair$_{t-1}$	-0.005	-0.003	-0.004	-0.001
	(-1.105)	(-0.508)	(-0.806)	(-0.139)
Ln(Board size)$_{t-1}$	-0.011	-0.024	-0.030*	-0.046***
	(-0.632)	(-1.282)	(-1.914)	(-2.607)
Ln(Director age)$_{t-1}$	-0.230***	-0.291***	-0.228***	-0.281***
	(-3.597)	(-4.055)	(-3.896)	(-4.169)
Observations	6,194	5,005	7,188	5,873
Adj. R-squared	0.459	0.473	0.445	0.454
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Panel B. Social capital and the effect of CSR contracting on firm risk

	Dependent: Return volatility	
Variables	(1)	(2)
CSR contracting$_{t-1}$	-0.012*	
	(-1.933)	
% CSR contracting$_{t-1}$		-0.494**
		(-2.280)

(continues)

(continued)

	Dependent: Return volatility	
Variables	(1)	(2)
Social capital$_{t-1}$	0.003	0.002
	(1.135)	(0.638)
CSR contracting$_{t-1}$ x Social capital$_{t-1}$	-0.008**	
	(-2.073)	
% CSR contracting$_{t-1}$ x Social capital$_{t-1}$		-0.259**
		(-2.126)
Leverage$_{t-1}$	0.008	0.007
	(0.302)	(0.217)
Ln(TA)$_{t-1}$	0.016**	0.020**
	(2.155)	(2.327)
Cash/TA$_{t-1}$	0.064*	0.053
	(1.903)	(1.425)
Dividend yield$_{t-1}$	1.080***	1.227***
	(4.608)	(4.525)
Ln(Total compensation)$_{t-1}$	0.004	0.008*
	(1.146)	(1.952)
CEO chair$_{t-1}$	-0.004	-0.001
	(-0.857)	(-0.107)
Ln(Board size)$_{t-1}$	-0.036**	-0.050***
	(-2.265)	(-2.864)
Ln(Director age)$_{t-1}$	-0.241***	-0.296***
Observations	7,048	5,764
Adj. R-squared	0.444	0.454
Firm FE	Yes	Yes
Year FE	Yes	Yes

4.4.4. Alternative explanation of the relationship between CSR contracting and firm risk

To this point, we have presented substantial evidence supporting the main hypothesis that CSR contracting has an adverse effect on managerial risk-taking. Specifically, we rely on the argument that incentivised CEOs pay more attention to stakeholders' interests and address the conflicts of risk preferences between stakeholders and shareholders by adopting a more prudent management approach. Nevertheless, three alternative explanations may lead to this observed relationship. As discussed in Section 4.1, the moderating effect of CSR contracting on firm risk may be due to the agency costs of CSR contracting, CEOs' risk aversion, or the actual relationship may reverse. In this section, we examine the baseline relationship from these angles. By doing so, we extend our

understanding of CSR contracting and strengthen our original interpretation of the relationship between CSR contracting and corporate risk-taking.

4.4.4.1. Reverse causality

The first issue that prevents our baseline analysis from being conclusive is reverse causality. It is possible that CSR contracting does not cause firm risk to decrease, but less risky firms are more likely to implement this compensation design subsequently. For example, firms with less risky business models may have more stable cash flow and sufficient funds to engage with stakeholders. As a result, CEOs have more flexibility and resources to pursue financial and sustainability targets. In this context, lower firm risk induces firms to adopt CSR contracting, but not in the reverse way as suggested by our empirical results to this point.

To address this concern, we implement the following fixed effects regressions that control for firm-level characteristics and firm- and year-fixed effects similar to the baseline specification. We regress *CSR contracting* and *% CSR contracting* on one-year lagged *Return volatility*. If our results are unaffected by reverse causality, then we should expect the coefficients of *Return volatility* to be insignificant across all regressions. Table 4.5 reports the results of the above fixed effects regressions. We find that the coefficients of lagged *Return volatility* are insignificant across all regressions, thereby mitigating the reverse causality concern.[45]

Table 4.5. Addressing reverse causality concerns

This table examines whether CSR contracting affects corporate risk-taking, using fixed effects regressions. In contrast to the baseline regressions, the dependent variables are *CSR contracting* and *% CSR contracting*. *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. The main explanatory variable is *Return volatility,* which is the annualised standard deviation of daily stock returns. Firm- and year-fixed effects are included in all regressions. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of variables" section.

[45] The results remain unchanged if we use other measures of firm risk, such as *Implied volatility* and *ROA volatility*, to replace *Return volatility* as the main regressor.

Variables	CSR contracting	% CSR contracting
	(1)	(2)
Return volatility$_{t-1}$	-0.020	-0.001
	(-0.430)	(-0.618)
Leverage$_{t-1}$	-0.090	-0.000
	(-0.955)	(-0.123)
Ln(TA)$_{t-1}$	-0.001	-0.001
	(-0.031)	(-1.019)
Cash/TA$_{t-1}$	-0.139	-0.006**
	(-1.399)	(-2.007)
Dividend yield$_{t-1}$	0.265	0.034
	(0.459)	(1.297)
Ln(Total compensation)$_{t-1}$	0.013	0.001*
	(1.513)	(1.851)
CEO chair$_{t-1}$	-0.014	-0.001*
	(-0.729)	(-1.777)
Ln(Board size)$_{t-1}$	-0.023	0.002
	(-0.425)	(1.065)
Ln(Director age)$_{t-1}$	-0.301	-0.007
	(-1.238)	(-1.210)
Observations	6,838	5,469
Adj. R-squared	0.128	0.037
Firm FE	Yes	Yes
Year FE	Yes	Yes

4.4.4.2. Agency explanation of the moderating impact of CSR contracting on firm risk

Our analysis to this point provides evidence of the negative relationship between CSR contracting and firm risk. Nevertheless, this relation may be open to the agency-based explanation. While CSR contracting is a component of firms' governance system to discipline CEO actions, the effectiveness of this compensation design may depend on firms' governance quality to monitor and enforce it. If firm governance is weak and inadequate to realise the benefits of CSR contracting, CEOs may exploit superior CSR performance as a shelter against internal and external monitoring. For example, CEOs can focus on CSR targets to gain a social reputation and protection from stakeholders while keeping their competitive status in the labour market (Cai et al., 2020).

Supporting this perspective, Bebchuk and Tallarita (2022) document that CSR contracting is a vague compensation design that lacks measurability, making it particularly difficult to measure the actual CSR performance of managers. This characteristic, combined with the lack of appropriate monitoring and reporting systems, hampers the reviewability of CSR contracting by outsiders. In this context, CEOs can inflate their own pay while making no valuable efforts to enhance stakeholder value. They may even overinvest to maximise CSR performance and buy public support, which insulates them from shareholder oversight. As a result of this increased insulation, CEOs may enjoy a quiet life and avoid costly efforts by forgoing risky, yet profitable, investments, thereby protecting their interests (Bertrand and Mullainathan, 2003). Collectively, if this agency-based explanation is valid, we expect that the moderating effect of CSR contracting on firm risk should be stronger (weaker) if the corporate governance quality of firms is weaker (stronger).

We test this conjecture by considering the joint impact of CSR contracting and governance quality on *Return volatility*. We construct three measures of governance quality. First, following Bebchuk et al. (2009), we construct *E index* that is the sum of six indicators, in which each indicator equals one if a firm has one of the following antitakeover provisions: staggered boards, limits to amend bylaws, supermajority, golden parachutes, and poison pill. The maximum value of *E index* is six, and the minimum value is zero. The higher value of *E index* indicates weaker governance quality and higher managerial entrenchment. Second, we construct *Board independence,* which is the ratio of the number of independent directors to the board size. Third, we construct *Block ownership* which is the combined ownership of all blockholders that own at least 5% of firms' outstanding shares.[46] The higher values of *Board independence* and *Block ownership* indicate a higher quality of corporate governance. We re-estimate equation (1) and control for measures of governance quality and their interaction terms with CSR contracting. If the agency-based explanation is valid, then the coefficients of the interaction terms should be significant. Panels A and B of Table 4.6 report the regression results when using *CSR contracting* and *% CSR contracting* as the main regressors, respectively. We find that the coefficients of the interaction

[46] This data is obtained from the ISS Incentive Lab database.

terms are insignificant, suggesting that the risk-reduction effect of CSR contracting is not sensitive to corporate governance quality. In other words, we partially rule out the agency-based explanation of the impact of CSR contracting on managerial risk-taking.

Table 4.6. The agency-based explanation of the effect of CSR contracting

This table examines whether the risk-reduction effect of CSR contracting on corporate risk-taking is sensitive to corporate governance quality, using fixed effects regressions. The dependent variable is *Return volatility,* which is the annualised standard deviation of daily stock returns. The main explanatory variables are *CSR contracting* (Panel A) and *% CSR contracting* (Panel B). *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. Regarding measures of corporate governance quality, *E index* is constructed following Bebchuk et al. (2009), as discussed in Section 4.4.4.2. *Board independence* is a ratio of the number of independent directors to board size. *Block ownership* is the combined ownership of blockholders holding more than 5% of firms' outstanding shares. Firm- and year-fixed effects are included in all regressions. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of variables" section.

Panel A. CSR contracting as the main regressor

	Dependent: Return volatility		
Variables	(1)	(2)	(3)
CSR contracting$_{t-1}$	-0.026*	-0.057*	-0.011*
	(-1.801)	(-1.787)	(-1.800)
E index$_{t-1}$	-0.008**		
	(-2.446)		
CSR contracting$_{t-1}$ x E index$_{t-1}$	0.006		
	(1.343)		
Board independence$_{t-1}$		-0.055**	
		(-1.977)	
CSR contracting$_{t-1}$ x Board independence$_{t-1}$		0.055	
		(1.432)	
Block ownership$_{t-1}$			0.002
			(0.523)
CSR contracting$_{t-1}$ x Block ownership$_{t-1}$			0.004
			(0.573)
Leverage$_{t-1}$	0.057**	0.006	0.031
	(2.071)	(0.231)	(1.068)
Ln(TA)$_{t-1}$	0.008	0.016**	0.015**
	(1.155)	(2.122)	(2.072)
Cash/TA$_{t-1}$	0.057*	0.066**	0.051
	(1.760)	(1.989)	(1.512)
Dividend yield$_{t-1}$	1.323***	1.153***	1.214***

(continues)

(continued)

	Dependent: Return volatility		
Variables	(1)	(2)	(3)
	(5.523)	(5.013)	(4.809)
Ln(Total compensation)$_{t-1}$	-0.001	0.004	0.005
	(-0.325)	(1.161)	(1.546)
CEO chair$_{t-1}$	-0.008	-0.003	-0.008
	(-1.545)	(-0.712)	(-1.559)
Ln(Board size)$_{t-1}$	-0.030*	-0.036**	-0.034**
	(-1.884)	(-2.285)	(-2.134)
Ln(Director age)$_{t-1}$	-0.169***	-0.235***	-0.277***
	(-2.880)	(-3.997)	(-4.386)
Observations	6,135	7,188	6,546
Adj. R-squared	0.468	0.443	0.442
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Panel B. % CSR contracting as the main regressor

	Dependent: Return volatility		
Variables	(1)	(2)	(3)
% CSR contracting$_{t-1}$	-0.819*	-1.929*	-0.189
			(continues)
	(-1.752)	(-1.728)	(-1.034)
E index$_{t-1}$	-0.006*		
	(-1.882)		
% CSR contracting$_{t-1}$ x E index$_{t-1}$	0.125		
	(0.884)		
Board independence$_{t-1}$		-0.035	
		(-1.188)	
% CSR contracting$_{t-1}$ x Board independence$_{t-1}$		1.707	
		(1.163)	
Block ownership$_{t-1}$			0.005
			(1.159)
% CSR contracting$_{t-1}$ x Block ownership$_{t-1}$			-0.396
			(-1.442)
Leverage$_{t-1}$	0.062*	0.003	0.034
	(1.938)	(0.103)	(1.015)
Ln(TA)$_{t-1}$	0.011	0.019**	0.020**
	(1.344)	(2.240)	(2.284)
Cash/TA$_{t-1}$	0.051	0.054	0.041
	(1.408)	(1.480)	(1.119)
			(continues)

(continued)

	Dependent: Return volatility		
Variables	(1)	(2)	(3)
Dividend yield$_{t-1}$	1.515***	1.297***	1.362***
	(5.563)	(4.853)	(4.624)
Ln(Total compensation)$_{t-1}$	0.003	0.008*	0.009**
	(0.821)	(1.950)	(2.402)
CEO chair$_{t-1}$	-0.007	-0.000	-0.005
	(-1.166)	(-0.081)	(-0.918)
Ln(Board size)$_{t-1}$	-0.052***	-0.051***	-0.044**
	(-2.870)	(-2.923)	(-2.461)
Ln(Director age)$_{t-1}$	-0.195***	-0.283***	-0.316***
	(-2.900)	(-4.185)	(-4.476)
Observations	4,934	5,873	5,351
Adj. R-squared	0.480	0.453	0.452
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

4.4.4.3. CEOs' risk aversion

The third explanation relates to executives' risk aversion. Accordingly, CSR contracting-induced investments can only pay off in the long run, and it takes time for firms to learn how to use CSR contracting effectively. These factors contribute to the increased uncertainty associated with CSR-based compensation (Berrone and Gomez-Mejia, 2009; Derchi et al., 2020). In addition, in the event of disappointed CSR performance, the labour market may perceive this failure as managerial shortcomings, thus amplifying CEOs' career concerns (Cai et al., 2020). To compensate for the increased uncertainty of executive compensation and careers due to CSR-based compensation, CEOs might reduce corporate risk-taking proportionally, leading to the observed relationship in the baseline analysis. If this explanation is valid, we expect that the moderating effect of CSR contracting on firm risk should be stronger (weaker) if CEOs are more (less) risk averse.

To measure the level of CEO risk aversion, we follow the prior literature and construct the following measures. First, we use *CEO age*, since younger CEOs have longer career horizons and are more willing to make risky decisions, including risky investment and financial policies, to

signal their superior abilities (Prendergast and Stole, 1996; Serfling, 2014; Li et al., 2017). Second, we use *General ability index* (i.e., *GAI*) constructed by Custódio et al. (2013) and Custodio et al. (2019). The higher value of *GAI* indicates greater general managerial ability. Prior literature shows that CEOs with greater managerial ability have a wider range of outside career opportunities, since their general management skills can be widely applied across firms and industries, compared to specialist CEOs with focused business experience (Custódio et al., 2013). As a result, generalist CEOs (i.e., CEOs with high levels of *GAI*) are less risk-averse. To test the "CEOs' risk-aversion" alternative explanation, we examine whether the impact of CSR contracting on firm risk correlates with the *CEO age* and *GAI* levels. Accordingly, if this explanation is valid, CSR contracting should be less effective if CEOs are younger and have higher general managerial ability.

Table 4.7 reports the results of the regressions of *Return volatility* on measures of firm risk, measures of CEOs' risk-aversion, and the interaction terms between CSR contracting and CEOs' risk-aversion. We find that none of the coefficients of the interaction terms are significant, suggesting that the risk-reduction effect of CSR contracting is insensitive to executives' risk attitudes. This evidence lends support to the notion that the uncertainty associated with CSR-based compensation does not induce CEOs to reduce risk-taking to offset the increased compensation risk. Collectively, we partially rule out the "CEOs' risk-aversion" explanation.

Table 4.7. The "CEO risk-aversion" explanation of the effect of CSR contracting

This table examines whether the risk-reduction effect of CSR contracting on corporate risk-taking is sensitive to the risk-aversion of CEOs, using fixed effects regressions. The dependent variable is *Return volatility,* which is the annualised standard deviation of daily stock returns. The main explanatory variables are *CSR contracting* (Panel A) and *% CSR contracting* (Panel B). *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. Regarding measures of CEO risk aversion, *General ability index* (GAI) is constructed by Custódio et al. (2013) and Custodio et al. (2019), as discussed in Section 4.4.4.3. Firm- and year-fixed effects are included in all regressions. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of variables" section.

	Dependent: Return volatility			
Variables	(1)	(2)	(3)	(4)
CSR contracting$_{t-1}$	-0.012*		-0.006	
	(-1.958)		(-0.154)	
% CSR contracting$_{t-1}$		-0.477*		-1.131
		(-1.651)		(-1.203)
General ability index$_{t-1}$	-0.001	-0.002		
	(-0.443)	(-0.512)		
CSR contracting$_{t-1}$ x General ability index$_{t-1}$	-0.003			
	(-0.669)			
% CSR contracting$_{t-1}$ x General ability index$_{t-1}$		-0.026		
		(-0.175)		
CEO age$_{t-1}$			0.000	0.000
			(0.155)	(0.346)
CSR contracting$_{t-1}$ x CEO age$_{t-1}$			-0.000	
			(-0.157)	
% CSR contracting$_{t-1}$ x CEO age$_{t-1}$				0.010
				(0.607)
Leverage$_{t-1}$	0.013	0.009	0.017	0.015
	(0.490)	(0.267)	(0.602)	(0.467)
Ln(TA)$_{t-1}$	0.014*	0.018**	0.014*	0.018**
	(1.819)	(2.141)	(1.859)	(2.059)
Cash/TA$_{t-1}$	0.070**	0.068*	0.064*	0.052
	(2.147)	(1.873)	(1.868)	(1.395)
Dividend yield$_{t-1}$	1.188***	1.396***	1.141***	1.292***
	(5.050)	(5.055)	(4.841)	(4.709)
Ln(Total compensation)$_{t-1}$	0.005	0.009**	0.004	0.008*
	(1.521)	(2.243)	(1.016)	(1.912)
CEO chair$_{t-1}$	-0.004	-0.001	-0.004	-0.001
	(-0.829)	(-0.165)	(-0.906)	(-0.186)
Ln(Board size)$_{t-1}$	-0.032**	-0.042**	-0.038**	-0.054***
	(-2.047)	(-2.352)	(-2.386)	(-3.054)
Ln(Director age)$_{t-1}$	-0.230***	-0.296***	-0.234***	-0.287***
	(-3.800)	(-4.265)	(-3.736)	(-4.178)
Observations	7,005	5,720	7,054	5,761
R-squared	0.444	0.458	0.444	0.455
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

4.5. Addressing endogeneity concerns

One concern with our baseline findings in Table 4.2 is the endogeneity of CSR contracting regarding its impact on corporate risk-taking. Although we control for different time-varying firm characteristics, firm- and year-fixed effects, we cannot completely rule out the possibility that

there are unspecified omitted factors that drive our main results, as they could influence both the likelihood of the adoption of CSR contracting and firm risk. If such unobserved factors exist, the relationship between CSR contracting and firm risk would remain negative, even though, in reality, CSR contracting may not have a meaningful causal effect on managerial risk-taking.

One ideal solution to mitigate endogeneity concerns and ensure the reliability of our baseline findings is to compare, at the same period, the variation of firm risk when a firm decides to link CEO compensation to CSR criteria and when it does not. However, the level of firm risk under the latter circumstance is unobservable, thus making this experiment infeasible. The second-best solution is to implement an alternative experiment in which we compare a firm's risk-taking level (with CSR contracting) to the level of corporate risk-taking of another matched firm (without CSR contracting) that is sufficiently indistinguishable from the initial firm. By doing so, we can assess how the presence of CSR pay influences corporate risk-taking, which otherwise is potentially affected by unobserved factors that we cannot measure and control for.

Following this strategy, in this section, we implement three common approaches to alleviate the endogeneity concerns. First, we implement the propensity score matching analysis in which firms with and without CSR contracting are matched together based on observable firm characteristics, thus isolating the variation in firm risk attributed to the presence of CSR contracting provisions. Second, we implement the difference-in-differences analysis, which utilises the first-time adoption of CSR contracting as the treatment event and reflects the divergence of the trend of firm risk between two groups of firms. Last, following Flammer et al. (2019), we employ an instrumental variable approach to isolate an exogenous component of CSR contracting and use this component to explain changes in managerial risk-taking.

4.5.1. Propensity score matching

In the first attempt to alleviate endogeneity concerns, we exploit the propensity score matching analysis. This analysis aims to match firms with CSR contracting (i.e., the treatment group) with firms without CSR contracting (i.e., the control group). Eventually, post-match firms have identical characteristics and a similar likelihood to adopt CSR contracting, but one group adopts

this compensation design while the other does not. Except for the presence of CSR contracting provisions in CEO pay, all observable differences between the two groups are removed. As a result, we increase the likelihood that any difference in firm outcomes (i.e., firm risk) is due to the presence of CSR-based compensation but not other factors.

To implement this analysis, we start by estimating the probability that a firm adopts CSR contracting. The probability (i.e., the propensity score) of adopting CSR contracting is a predicted value from a probit regression where *CSR contracting* is regressed on the baseline specification's one-year lagged control variables, industry- and year-fixed effects. We use the Fama-French 12 industry classification to construct the industry fixed effects. Panel A of Table 4.8 reports the results of the probit regression. Accordingly, we find that firms that are larger and provide higher CEO pay are more likely to link CEO compensation to CSR metrics, consistent with Qin and Yang (2022).

In the next step, we use the nearest neighbour matching algorithm to match firms in the treatment group with those in the control group without replacement.[47] In more detail, an observation in the treatment group is matched with an observation in the control group with the nearest propensity score to the former. If a control firm can be matched with one or more firms in the treatment group, we retain only a pair of firms with the smallest difference in propensity scores. Further, to ensure the accuracy of our results, we require that each pair of firms' propensity score difference (i.e., the caliper) must be smaller or equal to 0.005 (e.g., Chen et al., 2017).[48] Besides, we implement an additional diagnostic test using the post-match sample, as reported in Column 2 of Panel A. Opposite to the pre-match probit regression's results, none of the control variables can explain the probability of adopting CSR contracting in the post-match regression. This evidence suggests that matched firms have no distinguishable characteristics that can simultaneously determine firm risk and the adoption of CSR contracting.

[47] Matching without replacement means that once a control firm (observations) is matched with a treated firm (observations), it is not eligible to be matched with other treated firms (observations).
[48] Our results remain the same if we adjust the caliper to different values, including 0.05, 0.01, 0.001, and 0.0005, to allow for stricter or looser matching.

Panel B in Table 4.8 compares firm characteristics between the treatment and control groups after the propensity score matching. Firms in both groups are statistically indifferent to each other across observable factors, except for the presence of CSR criteria in CEO compensation. Collectively, these diagnostic tests increase our confidence that any difference in the level of firm risk between treatment and control groups is due to the presence of CSR contracting, not firm characteristics.

In Panel C of Table 4.8, we report the propensity score matching estimates. Our results show a significant difference in *Return volatility* between the two groups of firms (at the 5% level), meaning that treated firms are less risky than control firms. While these firms have indistinguishable observable characteristics, the decline in firm risk is highly likely due to the presence of CSR contracting. Specifically, the observed decrease in firm risk is 0.01, representing 3.2% of the sample mean of *Return volatility*. Overall, this evidence strengthens our baseline results.

Table 4.8. Propensity score matching analysis

This table reports the results of the propensity score matching approach. Panel A reports the pre-match and post-match propensity score regressions. The dependent variable is CSR contracting. *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. The same control variables and fixed effects as in the baseline regression (Table 4.2) are included. Panel B reports the post-match differences in firm characteristics between samples of firms with and without CSR contracting. Panel C reports the average treatment effect of the treated. The variable of interest is *Return volatility,* which is the annualised standard deviation of daily stock returns. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of variables" section.

Panel A. Pre-match and post-match regression results

	Dependent: CSR contracting	
	Pre-match	Post-match
Variables	(1)	(2)
$Leverage_{t-1}$	0.127	0.123
	(0.490)	(0.407)
$Ln(TA)_{t-1}$	0.121***	0.008
	(2.688)	(0.155)
$Cash/TA_{t-1}$	-0.414	-0.223
	(-1.088)	(-0.518)

(continues)

(continued)

	Dependent: CSR contracting	
	Pre-match	Post-match
Variables	(1)	(2)
Dividend yield$_{t-1}$	2.653	0.946
	(1.077)	(0.348)
Ln(Total compensation)$_{t-1}$	0.169***	-0.012
	(3.466)	(-0.210)
CEO chair$_{t-1}$	-0.128	-0.034
	(-1.530)	(-0.351)
Ln(Board size)$_{t-1}$	0.364*	-0.027
	(1.891)	(-0.113)
Ln(Director age)$_{t-1}$	0.111	0.225
	(0.144)	(0.244)
Observations	7,169	3,232
Industry FE	Yes	Yes
Year FE	Yes	Yes

Panel B. Post-match differences in firm characteristics

Variables	CSR contracting = 1	CSR contracting = 0	Difference	t-stat
Leverage	0.280	0.273	0.007	1.210
Ln(TA)	9.940	9.916	0.024	0.510
Cash/TA	0.111	0.117	-0.006	-1.440
Dividend yield	0.020	0.020	0.001	1.090
Ln(Total compensation)	9.133	9.140	-0.006	-0.260
CEO chair	0.655	0.668	-0.012	-0.740
Ln(Board size)	2.386	2.383	0.003	0.500
Ln(Director age)	4.131	4.130	0.001	0.620

Panel C. Propensity score matching estimator

Variables	Firm-years with CSR contracting	Firm-years without CSR contracting	Difference	t-stat
Return volatility	0.283	0.293	-0.01	-1.99**

4.5.2. Difference-in-differences analysis using the first-time adoption of CSR contracting

Another common approach to alleviate endogeneity concerns is the Difference-in-differences (DiD) analysis. We aim to observe and compare the variation of firm risk for the periods before and after the treatment event. In this analysis, we consider the first year of CSR contracting

adoption as the treatment event for two reasons. First, the first-time CSR contracting adoption likely has the largest impact on executive behaviour and subsequent firm outcomes, compared to the later firm years with CSR contracting. Second, the effect of the first-time adoption is not confounded by the effects of CSR contracting provisions in the previous years.

Similar to Section 4.5.1, we separate the data sample into two groups: (i) the treatment group in which firms adopt CSR contracting for at least one time; and (ii) the control group in which firms do not adopt CSR contracting ever. To qualify for the DiD analysis, all included firms must have the data observations three years before (year *t-3*, year *t-2*, and year *t-1*) and three years after (year *t+1*, year *t+2*, year *t+3*) the first-time adoption of CSR contracting (i.e., the treatment event, considered as year *t*). The chosen lengths of pre- and post-treatment periods are long enough to retain sufficient observations for accurate analyses. We also exclude the treatment year (year *t*) to avoid the noise caused by the transition.

In the next step, similar to Section 4.5.1, we perform propensity score matching between firm-year observations in the treatment group and those in the control group, ensuring that the matched firms are indistinguishable from each other. To implement this step, we first estimate the propensity score measuring the likelihood that a firm would link CEO compensation to CSR performance criteria. To ensure consistency with the previous section, we estimate this score by employing the probit regression model. Then, using the estimated propensity scores, we implement a one-on-one matching without replacement, meaning that one treated observation is matched with one control observation, and both observations cannot be returned to the initial sample and paired more than once. Regarding the matching quality, we need to consider a potential trade-off. If the firm-year observations are matched too closely, there is a risk of having too few well-matched pairs, which could lead to unreliable results in the DiD analysis. In contrast, if the matching criteria are too loose, the impact of unobserved factors on the outcomes may increase, as the treated and control samples may no longer be indistinguishable. To address this concern, we conduct a propensity score matching with a caliper of 0.05.

Panel A of Table 4.9 compares the post-match firm characteristics between two groups of treated and control firms. Accordingly, observable firm characteristics are statistically comparable

between the two groups of firms, suggesting that any variation in the level of firm risk after the treatment event in year *t* is highly likely due to the effect of the first-time adoption, not the pre-existing differences between firms. After the matching procedure, we are left with 1236 firm-year observations. Because we require that each firm must have at least three years before and three years after the treatment, 1236 firm-year observations are equivalent to 103 pairs of firms. Then, to estimate the average treatment effect of CSR contracting on firm risk, we estimate the following specification using the fixed effects regression model.

$$Firm\,risk_{i,t} = \beta + \beta_1 \times Treatment_{i,t} + \beta_2 \times Post_{i,t} + \beta_3 \times Treatment_{i,t} \times Post_{i,t} + \beta_4 \times Controls_{i,t} + Firm_i + Year_i + \epsilon_{i,t} \quad (2)$$

Where *Firm risk* is measured by *Return volatility*. *Treatment* is an indicator that equals one for treated firms, and zero otherwise. *Post* is an indicator that equals one for fiscal years after the year of the first-time adoption (i.e., year *t+1*, year *t+2*, and year *t+3*), and zero otherwise. *Controls* are control variables included in our baseline analysis. Similar to the baseline specification, we include firm- and year-fixed effects in all regressions.

Panel B of Table 4.9 provides the estimation results for equation (2). Accordingly, we find in Column 1 that the coefficient of the interaction term between *Treatment* and *Post* is negative and significant at the 1% level. Consistent with the baseline findings, this result lends support to the notion that the first-time adoption of CSR contracting has a negative and considerable impact on firm risk, compared to the pre-treatment period.

The key identifying assumption in the DiD analysis is that the average change in corporate risk-taking would have been the same between the treatment and control groups in the absence of the treatment event. This assumption is referred to as the parallel trend assumption. In the final analysis of this section, we assess the validity of the parallel trend assumption, which forms the basis of our DiD analysis. Following the approach of Samuels (2021), we examine the difference in the level of firm risk between treated firms and control firms each year before and after the first-time adoption. Accordingly, for each year surrounding the adoption year, we construct a corresponding indicator variable that equals one for this year, and zero otherwise. After

implementing this procedure, we have a list of indicators, including Pre_{t-3}, Pre_{t-2}, and Pre_{t-1} for three years before the adoption, and $Post_{t+1}$, $Post_{t+2}$, and $Post_{t+3}$ for three years after the first-time adoption. We re-estimate equation (2) and include the interaction terms between *Treatment* and these time indicator variables, while omitting the Pre_{t-3} variable and its interaction term with *Treatment*.

We report the regression results in Column 2, Panel B of Table 4.9. For the period of two years before the first-time adoption, the coefficients of the interaction terms are insignificant. These results suggest that the difference-in-differences in the pre-treatment periods are insignificant, and the trends of the two groups' firm risk are similar to each other. On the contrary, the difference-in-differences becomes statistically significant immediately after the adoption in year *t+1* and year *t+2* at the 10% level. However, the difference-in-differences in year *t+3* are not statistically significant, indicating a potential weakening effect of the first-time adoption after the first two years. We illustrate these results in Figure 4.1. Collectively, the results suggest similar trends in firm risk between two groups of firms before the adoption. However, a significant divergence in these trends becomes evident simultaneously with the introduction of CSR contracting.

Table 4.9. Difference-in-differences analysis using the first-time adoption of CSR contracting

This table reports the results of difference-in-differences analysis using the first-time adoption of CSR contracting as the treatment event. This analysis requires firms to have data three years before and three years after the first-time adoption of CSR contracting. Panel A reports the covariate balance between the treatment and control groups. Panel B reports the results of the difference-in-differences regressions. The dependent variable is *Return volatility,* which is the annualised standard deviation of daily stock returns. *Treatment* is an indicator that equals one for treatment firms, and zero otherwise. *Post* is an indicator variable that equals one for fiscal years after the first year of CSR contracting adoption, and zero otherwise. The definitions of explanatory variables in Column 2 of Panel B follow the discussion in Section 4.5.2. The same control variables and fixed effects as in the baseline regression (Table 4.2) are included. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of variables" section.

Panel A. Post-match differences in firm characteristics

Variables	Treatment firms	Control firms	Difference	*t*-stat
Leverage	0.258	0.257	0.001	0.15
Ln(TA)	9.745	9.807	-0.062	-0.93
Cash/TA	0.121	0.124	-0.003	-0.51

(continues)

(continued)

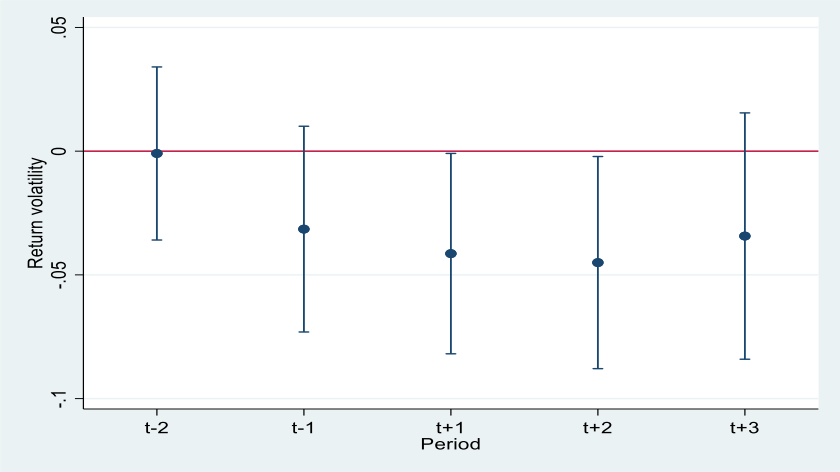
Variables	Treatment firms	Control firms	Difference	*t*-stat
Dividend yield	0.019	0.019	-0.001	-0.6
Ln(Total compensation)	8.981	9.009	-0.028	-0.78
CEO chair	0.675	0.706	-0.031	-1.34
Ln(Board size)	2.368	2.376	-0.007	-0.71
Ln(Director age)	4.123	4.119	0.004	1.3

Panel B. Difference-in-differences regression results

Variables	*Dependent: Return volatility*	
	(1)	(2)
Post	0.015	
	-1.435	
Treat × Post	-0.041***	
	(-2.654)	
Treat × Pre_{t-2}		-0.001
		(-0.044)
Treat × Pre_{t-1}		-0.032
		(-1.250)
Treat × $Post_{t+1}$		-0.041*
		(-1.687)
Treat × $Post_{t+2}$		-0.045*
		(-1.732)
Treat × $Post_{t+3}$		-0.034
		(-1.137)
Pre_{t-2}		-0.025
		(-1.411)
Pre_{t-1}		0.02
		-1.012
$Post_{t+1}$		0.007
		-0.406
$Post_{t+2}$		0.017
		-1.03
$Post_{t+3}$		0.007
		-0.352
Controls	Yes	Yes
Observations	1,236	1,236
Adj. R-squared	0.518	0.52
Firm FE	Yes	Yes
Year FE	Yes	Yes

Figure 4.1. Examining the parallel trend assumption

This figure plots the coefficients of the interaction terms between *Treatment* variables and the time indicators of years before and after the first-time adoption of CSR contracting, as discussed in Section 4.5.2. We use year *t-3* as the benchmark year and plot the coefficients reported in Column 2, Panel B of Table 4.9.



4.5.3. Instrumental variable analysis

To further address endogeneity concerns, we use the two-stage least squares (2SLS) regression approach as an alternative specification to isolate the exogenous component of CSR contracting and use it to explain changes in corporate risk-taking. Following Flammer et al. (2019), we use *Constituency statutes* as an instrument for this analysis.

In the US, Constituency statutes enable managers and directors to explicitly consider the interests of various stakeholders in making corporate decisions without being considered as breaching their fiduciary duties to shareholders. Before the enactment of constituency statutes, directors and managers were legally constrained from considering stakeholder interests in their decision-making. Nevertheless, after the enactment of constituency statutes, corporate leaders encounter no regulatory barriers in addressing stakeholders' concerns explicitly. In this context, firms are more likely to adopt CSR contracting provisions to engage with stakeholders more effectively (Flammer et al., 2019). In line with this reason, we expect that the constituency statutes variable would positively correlate with two CSR contracting measures.

In this analysis, we construct *Constituency statutes* as an indicator variable that equals one if a firm is incorporated in a state that enacts constituency statute, and zero otherwise. We match the enactment years of constituency statutes by US states reported in Karpoff and Wittry (2018) to

our dataset. Although most states enacted constituency statutes before 2000, two states enacted this statute in our sample period, including Texas (2006) and Nebraska (2007). This enables us to observe exogenous variation in the adoption of CSR contracting and implement 2SLS analysis.

Columns 1 and 3 of Table 4.10 report the first-stage regression results. For these columns, we use *CSR contracting* and *% CSR contracting* as the main dependent variables, respectively. We use *Constituency statutes* as the main regressor while controlling for other firm characteristics and fixed effects as in the baseline regression. Consistent with the rationale behind the use of this instrument, the coefficients of *Constituency statutes* are positive and significant at the 1% significance level, meaning that the enactment of constituency statutes increases firms' propensity to adopt CSR contracting. On average, firms incorporated in US states that enact constituency statutes are 50% more likely to adopt CSR contracting provisions, suggesting that our instrument is highly relevant in explaining the variation of the endogenous regressors.[49]

Next, we examine whether the *Instrumented CSR contracting* and *Instrumented % CSR contracting*, which are the predicted values of *CSR contracting* and *% CSR contracting* in the first-stage regressions, can explain the variation in firm risk (proxied by *Return volatility*). The rationale behind this analysis is analogous to our baseline analysis in which we expect that the coefficients of instrumented measures of CSR contracting are negative and significant. We report the second-stage regression results in Columns 2 and 4 of Table 4.10. Consistent with our prediction, *Instrumented CSR contracting* and *Instrumented % CSR contracting* are negatively associated with *Return volatility*, suggesting that the increase (decrease) in the likelihood of CSR contracting adoption and its substantiveness, due to the presence (absence) of constituency statutes, leads to a decrease (increase) in firm risk. The sign and significance of coefficients of other explanatory variables are largely consistent with Table 4.2. Overall, this empirical evidence suggests that our baseline results are less likely to suffer from the endogeneity of CSR contracting,

[49] We find that the F-statistics for two first-stage regressions are well above 10, while the Kleibergen-Paap rk Wald F statistics are larger than Stock-Yogo's critical values (Stock and Yogo, 2005), suggesting that our instrument is relevant and not weak.

supporting our main hypothesis that CEOs behave more conservatively when incentivised to address stakeholders' concerns.

Table 4.10. Instrumental variable analysis

This table reports the results of the instrumental variable analysis using two-stage least square panel regressions. In the first-stage regressions (Columns 1 and 3), the dependent variables are *CSR contracting* and *% CSR contracting*. *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. The main regressor in first-stage regressions is *Constituency statutes*, which is the instrumental variable of this analysis. *Constituency statutes* is an indicator variable that equals one if a firm is incorporated in the US state that enacts a constituency statute, and zero otherwise. In the second-stage regressions (Columns 2 and 4), the dependent variable is *Return volatility,* which is the annualised standard deviation of daily stock returns. The main regressors are the predicted values of *CSR contracting* and *% CSR contracting* from the first-stage regressions. The same control variables and fixed effects as in the baseline regression (Table 4.2) are included. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of variables" section.

	1st stage	2nd stage	1st stage	2nd stage
	CSR contracting	Return volatility	% CSR contracting	Return volatility
Variables	(1)	(2)	(3)	(4)
Constituency statute$_{t-1}$	0.500***		0.020**	
	(8.958)		(2.227)	
CSR contracting$_{t-1}$		-0.157**		
		(-2.378)		
% CSR contracting$_{t-1}$				-4.193***
				(-10.846)
Leverage$_{t-1}$	-0.106	-0.007	-0.001	0.004
	(-1.203)	(-0.219)	(-0.179)	(0.122)
Ln(TA)$_{t-1}$	-0.000	0.015*	-0.000	0.017**
	(-0.003)	(1.763)	(-0.702)	(1.974)
Cash/TA$_{t-1}$	-0.069	0.051	-0.004	0.035
	(-0.711)	(1.399)	(-1.454)	(0.911)
Dividend yield$_{t-1}$	1.055*	1.286***	0.022	1.370***
	(1.868)	(4.788)	(0.867)	(4.651)
Ln(Total compensation)$_{t-1}$	0.013	0.006	0.000	0.009**
	(1.515)	(1.508)	(1.402)	(2.251)
CEO chair$_{t-1}$	-0.021	-0.007	-0.000	-0.002
	(-1.178)	(-1.272)	(-0.714)	(-0.373)
Ln(Board size)$_{t-1}$	-0.039	-0.043**	0.001	-0.049**
	(-0.768)	(-2.491)	(0.267)	(-2.388)
Ln(Director age)$_{t-1}$	-0.269	-0.283***	-0.008	-0.326***
	(-1.179)	(-3.966)	(-1.364)	(-4.524)

(continues)

(continued)

	1st stage	2nd stage	1st stage	2nd stage
	CSR contracting	Return volatility	% CSR contracting	Return volatility
Variables	(1)	(2)	(3)	(4)
Observations	6,979	6,979	5,714	5,714
Firm, CEO, and Board controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

4.6. Additional analyses

4.6.1. CSR contracting and corporate policies

To this point, our analyses have provided reliable evidence indicating that CEOs with CSR contracting provisions in their contracts behave more conservatively to minimise the impacts of the downside risks on stakeholder value. In this section, we take a further step by examining changes in corporate policies when CSR contracting provisions are active. This analysis sheds light on the channels through which CSR contracting impacts firm risk.

We focus on two corporate policies that CEOs may adjust when CSR performance criteria are in place, including financial leverage and R&D expenditures. As financial leverage and R&D expenditures pertain to the riskiness of CEOs' financial and operational decisions, linking these policies with CSR contracting offers insights into managerial strategies for a more prudent management approach (Coles et al., 2006; Ljungqvist et al., 2017; Do et al., 2022). We construct *Leverage* as the ratio of the sum of debts in current liabilities and long-term debts to total book assets.[50] We construct *R&D intensity* as the ratio of R&D expenditures to net property, plant, and equipment (PPENT).[51]

To examine the potential impacts of CSR contracting on firm policies, we exploit the 2SLS regressions that use *Constituency statutes* as an instrumental variable and the measures of the above policies as dependent variables. The prior literature suggests that firms are riskier if they are highly leveraged and have high R&D investments (e.g., Coles et al., 2006). If CSR contracting

[50] We do not control for *Leverage* in the regressions where *Leverage* is a dependent variable.
[51] Consistent with prior research, we assign zero value to missing R&D expenditures.

moderates CEO risk-taking decisions, incentivised CEOs would reduce leverage and R&D investments correspondingly. In other words, the coefficients of CSR contracting in all regressions should be negative and significant.

Table 4.11 presents the results of 2SLS regressions using *CSR contracting* and *% CSR contracting* as the main regressors. Specifically, for each model, the first-stage results (which are not shown for brevity) involve regressing CSR contracting measures on *Constituency statutes* as described in Section 4.5.3. We then estimate *Instrumented CSR contracting* and *Instrumented % CSR contracting* as predicted values of the dependent variables in the first-stage regressions. In the next step, *Leverage* and *R&D intensity*, which proxies for the riskiness of firms' financial and operation activities, are regressed on the instrumented measures of CSR contracting. We report the results of second-stage regressions in Table 4.11. Consistent with our conjectures, CSR contracting negatively and significantly impacts financial leverage and R&D expenditures. Taken together, this evidence lends support to our second and third hypotheses that CSR contracting reduces firm risk by moderating the extremity of CEO decisions regarding firms' financial and investment policies.

Table 4.11. CSR contracting and corporate policies

This table examines whether CSR contracting affects corporate policies, including financial leverage and R&D expenditures, by using the instrument variable approach. In the second-stage regressions, *Leverage* is the ratio of the sum of debts in current liabilities and long-term debts to total book assets. *R&D intensity* is the ratio of R&D expenditures to net property, plant, and equipment (PPENT). The instrumental variable is *Constituency statutes. Constituency statutes* is an indicator variable that equals one if a firm is incorporated in the US state that enacts a constituency statute, and zero otherwise. The main regressors in the second-stage regressions are the predicted values of *CSR contracting* and *% CSR contracting* from the first stage. The first-stage regression results are not reported for brevity. The same control variables and fixed effects as in the baseline regression (Table 4.2) are included. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of variables" section.

	Leverage		R&D intensity	
Variables	(1)	(2)	(3)	(4)
Instrumented CSR contracting$_{t-1}$	-0.121***		-0.054*	
	(-2.831)		(-1.645)	
Instrumented % CSR contracting$_{t-1}$		-2.186***		-1.694**
		(-11.890)		(-2.476)

(continues)

(continued)

	Leverage		R&D intensity	
Variables	(1)	(2)	(3)	(4)
$Leverage_{t-1}$		0.716***	0.010	-0.019
		(40.979)	(0.176)	(-0.309)
$Ln(TA)_{t-1}$	0.012	0.002	-0.032*	-0.037
	(1.439)	(0.380)	(-1.668)	(-1.608)
$Cash/TA_{t-1}$	-0.057	-0.030	0.322***	0.304**
	(-1.571)	(-1.386)	(2.597)	(2.207)
Dividend $yield_{t-1}$	1.000***	0.332***	0.628*	0.674*
	(5.180)	(3.094)	(1.773)	(1.722)
$Ln(Total\ compensation)_{t-1}$	-0.003	0.000	-0.007	-0.007
	(-0.963)	(0.254)	(-0.834)	(-0.679)
CEO $chair_{t-1}$	-0.003	0.002	0.002	0.003
	(-0.633)	(0.808)	(0.180)	(0.270)
$Ln(Board\ size)_{t-1}$	0.047***	0.020**	0.009	-0.001
	(2.926)	(2.299)	(0.327)	(-0.018)
$Ln(Director\ age)_{t-1}$	-0.026	-0.042	-0.015	-0.058
	(-0.340)	(-1.088)	(-0.129)	(-0.414)
N	6,977	5,698	6,721	5,478
Adj. R-squared	0.046	0.544	0.037	0.046
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

4.6.2. CSR contracting and firm performance

Although CSR contracting encourages CEOs to adopt conservative corporate policies, this provision may also be a lousy incentive design that renders CEO decisions ineffective. Because shareholder value and stakeholder value depend on future earnings, lower risk itself is not a desirable outcome if it results in decreased operating efficiency (Waddock and Graves, 1997). In this vein, the moderating effect of CSR contracting is not desirable if this compensation design leads to sub-optimal risk-taking that deteriorates firm performance.

More specifically, social and environmental performance take longer to realise, compared to financial performance. Meanwhile, CEOs' tenure is usually shorter, and they receive various pressures to focus on the interests of more salient stakeholders (i.e., shareholders), their career concerns, short-term compensation, and investors' earning expectations (Flammer et al., 2019). As discussed in Section 4.4.3, risk-averse CEOs may respond to the increased compensation risk

introduced by CSR contracting by avoiding undertaking risky yet profitable investments. Second, compared to financial criteria, the tasks of choosing and defining CSR criteria, setting performance targets, controlling and monitoring CSR performance are more complicated (Eccles et al., 2014; Ioannou et al., 2016). These factors lead to the lack of measurability and reviewability of CSR contracting by outsiders (Bebchuk and Tallarita, 2022). As a result, shareholder oversight is reduced, creating opportunities for CEOs to pursue sub-optimal risk-taking strategies and enjoy a quiet life at the expense of firm performance. Third, the multidimensional tasks model of Holmstrom and Milgrom (1991) suggests that CEOs, who have multiple tasks, may inefficiently allocate their time and efforts between targets. Accordingly, the existence of substantial compensation weight linked to CSR-based compensation may shift CEOs' attentions away from important financial targets, since there are competing relations, at least in the short term, between financial and non-financial targets (Holmstrom and Milgrom, 1991; Flammer et al., 2019). Collectively, the subsequent financial performance of firms may be adversely affected.

On the contrary, CSR contracting can facilitate more efficient managerial risk-taking. It is possible that CEOs with CSR contracting will pay more attention to the long-term viability of investment projects, instead of solely focusing on short-term profitability. CEOs may apply a more thorough analysis and stricter, yet effective, monitoring throughout the project lifecycle. Concurrently, they may remain vigilant to unforeseen market and macroeconomic shifts that could diminish stakeholder value. In this vein, instead of forgoing strategic projects that hurt shareholder value, incentivised CEOs may opt for judicious investment decisions and adopt innovative management approaches to manage and control firm risk. This approach allows incentivised CEOs to protect stakeholders' interests while fostering shareholder value simultaneously. Furthermore, we conjecture that the above effect is more pronounced during adverse market conditions when effective risk-taking determines future financial performance.

To examine the impact of CSR contracting on firm performance, we construct two measures of firms' operating and stock performance. Specifically, we construct *NI/SEQ,* which is the ratio of net income to book value of equity. We construct *Abnormal returns,* which is the difference between firms' actual and expected stock returns estimated by the three-factor Fama-French

model.[52] Similar to Section 6.1, we utilise the instrumental variable analysis using *Constituency statutes* as an instrument for this analysis. First, we estimate the *Instrumented CSR contracting* and *Instrumented % CSR contracting* from the first-stage regressions (not presented in the table of results for brevity). Second, we regress *NI/SEQ* and *Abnormal returns* on instrumented measures of CSR contracting in the second stage and report the results in Panel A of Table 4.12. Accordingly, we find that the exogenous component of CSR contracting positively affects future profitability and abnormal returns. These findings are consistent with Flammer et al. (2019) that CSR contracting enhances firms' CSR performance and firm value.

Exploring the impact of CSR contracting on firm performance conditioning on the market uncertainty, we repeat the above test for split samples based on different market conditions. Specifically, we split our sample into subsamples of above- and below-median CBOE NASDAQ-100 Volatility Index (*VXN*) observations. We name these subsamples as "*High market volatility*" and "*Low market volatility*", respectively. Panel B of Table 4.12 presents the regression results. The results of the 2SLS analysis show that CSR contracting significantly improves operating performance (measured by *NI/SEQ*) and stock performance (measured by *Abnormal returns*) when market volatility is high. Nevertheless, the impacts are smaller and insignificant when market volatility is below the median value of *VXN*. Collectively, this evidence lends support to the notion that CSR contracting motivates calculated and more effective managerial risk-taking.

Table 4.12. CSR contracting and firm performance

This table examines whether CSR contracting affects firms' operating and stock performance, by using the instrument variable approach. Panel A reports the second stage's results of 2SLS regressions where dependent variables are the following measures of firm performance. *NI/SEQ* is the ratio of net income to book value of equity. *Abnormal returns* is the difference between firms' actual stock returns and expected stock returns that are estimated by the three-factor Fama-French model. The instrumental variable is *Constituency statutes. Constituency statutes* is an indicator variable that equals one if a firm is incorporated in the US state that enacts a constituency statute, and zero otherwise. The main regressors in the second-stage regressions are the predicted values of *CSR contracting* and *% CSR contracting* from the first stage. The first-stage regression results are not reported for brevity. Panel B reports the second stage's results of 2SLS regressions of firm performance on CSR contracting measures, conditional on the levels of market uncertainty. We split our sample into subsamples of above- and below-median CBOE NASDAQ-100 Volatility Index (*VXN*) observations. Higher values of the VXN index indicate higher market uncertainty. The same control variables and fixed effects as in the baseline regression (Table 4.2) are included. Statistical significance is based on the heteroscedasticity-

[52] The factor data is provided by Kenneth R. French and available at https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the "Definitions of variables" section.

Panel A. The impacts of CSR contracting on firm performance

	NI/SEQ		Abnormal returns	
Variables	(1)	(2)	(3)	(4)
Instrumented CSR contracting$_{t-1}$	0.498*		0.0013***	
	(1.712)		(2.650)	
Instrumented %CSR contracting$_{t-1}$		15.192***		0.0293***
		(7.895)		(5.227)
Leverage$_{t-1}$	-0.045	-0.070	0.0003	0.0003
	(-0.349)	(-0.505)	(1.460)	(1.172)
Ln(TA)$_{t-1}$	-0.062*	-0.033	-0.0004***	-0.0004***
	(-1.889)	(-1.023)	(-5.293)	(-5.465)
Cash/TA$_{t-1}$	-0.012	0.026	0.0002	0.0003
	(-0.105)	(0.205)	(1.000)	(1.267)
Dividend yield$_{t-1}$	-1.842**	-1.797**	0.0004	0.0012
	(-2.411)	(-2.166)	(0.237)	(0.598)
Ln(Total compensation)$_{t-1}$	0.027**	0.020*	-0.0001***	-0.0001***
	(2.378)	(1.696)	(-2.895)	(-2.853)
CEO chair$_{t-1}$	0.006	0.001	0.0000	-0.0000
	(0.274)	(0.024)	(0.415)	(-0.378)
Ln(Board size)$_{t-1}$	-0.010	-0.041	0.0000	-0.0001
	(-0.177)	(-0.653)	(0.156)	(-0.743)
Ln(Director age)$_{t-1}$	0.286	0.228	0.0008	0.0010*
	(1.111)	(0.846)	(1.471)	(1.726)
N	6,976	5,705	6,982	5,714
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Panel B. The impacts of CSR contracting on firm performance, conditional on the levels of market uncertainty

	Dependent: NI/SEQ				*Dependent: Abnormal returns*			
	Low market volatility		High market volatility		Low market volatility		High market volatility	
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Instrumented CSR contracting$_{t-1}$	-0.034		1.337***		-0.000		0.003**	
	(-0.308)		(2.599)		(-0.055)		(2.312)	
Instrumented %CSR contracting$_{t-1}$		0.524		34.717***		-0.005		0.069***
		(0.140)		(10.066)		(-1.020)		(9.979)
Leverage$_{t-1}$	0.013	0.036	-0.077	-0.103	0.000	0.000	0.001	0.000
	(0.080)	(0.241)	(-0.346)	(-0.514)	(0.986)	(1.464)	(1.311)	(0.568)
Ln(TA)$_{t-1}$	-0.055	-0.017	-0.051	-0.048	-0.000***	-0.000***	-0.000***	-0.000***
	(-1.466)	(-0.447)	(-0.944)	(-1.055)	(-3.227)	(-3.049)	(-3.308)	(-3.949)
Cash/TA$_{t-1}$	-0.086	-0.138	-0.016	0.029	0.000	0.000	0.000	0.000
	(-0.619)	(-0.877)	(-0.066)	(0.139)	(1.524)	(0.992)	(0.080)	(0.218)
Dividend yield$_{t-1}$	-0.838	-1.386	-2.588**	-1.602*	0.002	0.002	0.001	0.004
	(-0.755)	(-0.989)	(-2.137)	(-1.663)	(1.254)	(0.924)	(0.434)	(1.377)
Ln(Total compensation)$_{t-1}$	0.039***	0.038**	0.007	0.011	-0.000	-0.000	-0.000***	-0.000**
	(2.900)	(2.356)	(0.313)	(0.575)	(-1.079)	(-1.246)	(-2.976)	(-2.482)
CEO chair$_{t-1}$	0.001	0.005	-0.014	-0.029	0.000	-0.000	-0.000	-0.000
	(0.058)	(0.174)	(-0.348)	(-0.859)	(0.884)	(-0.183)	(-0.528)	(-0.553)
Ln(Board size)$_{t-1}$	-0.020	-0.018	0.110	0.036	0.000	0.000	0.000	-0.000
	(-0.280)	(-0.222)	(0.958)	(0.401)	(0.905)	(1.133)	(0.589)	(-0.393)
Ln(Director age)$_{t-1}$	-0.109	-0.302	0.858*	1.066***	0.001	0.001*	0.001	0.002*
	(-0.360)	(-0.832)	(1.733)	(2.782)	(1.259)	(1.931)	(1.045)	(1.689)
N	3,787	3,002	3,004	2,535	3,805	3,019	2,992	2,526
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

4.7. Conclusion

Stakeholder-contingent CEO pay, also known as CSR contracting, is a novel compensation design that firms adopt to direct CEO attention toward the interests of a broad set of stakeholders. Besides traditional financial tasks, incentivised CEOs are assessed by their performance based on a wide range of nonfinancial CSR metrics, such as improving environmental compliance, employee safety and diversity. We examine the potential impact of this diversity in managerial focus on the extremity of CEO decisions, thereby contributing valuable insight to existing research about the link between executive compensation designs and risk-taking incentives, such as equity-based compensation (Guay, 1999; Coles et al., 2006; Armstrong and Vashishtha, 2012) and other compensation schemes (Bettis et al., 2018; Do et al., 2022). This research also brings forth timely and important inquiries that hold relevance for practitioners and regulators, particularly in the context of firms' growing adoption of CSR pay and the global emphasis on sustainability development.

Using a hand-collected data sample of CSR contracting practises among S&P 500 companies from 2000 to 2018, we provide consistent evidence that the inclusion of CSR performance criteria in CEO compensation moderates managerial risk-taking. This risk-reduction effect of CSR contracting is due to the adoption of less risky financial and investment policies that reduce performance volatility. Our findings remain robust to alternative measures of firm risk, different empirical specifications, and additional tests to alleviate endogeneity concerns.

However, the risk-reduction effect of CSR contracting is not equal for all firms and in all circumstances. We find that CSR pay incentivises CEOs to behave more conservatively when the threats imposed on stakeholders' claims are more substantial, and when CEOs genuinely consider engaging with stakeholders is a crucial corporate strategy. This cross-sectional heterogeneity in the impact of CSR contracting on firm risk is reflected in corporate financial constraints and the level of social capital in which firms reside. Further analysis reveals that CSR contracting facilitates more effective risk-taking, thereby enhancing firms' operating and stock performance, especially during times of heightened market volatility. Overall, our findings support the view

that CSR contracting, as an efficient remuneration design, fosters a prudent and effective approach to risk-taking, which subsequently creates value for both shareholders and stakeholders.

Chapter 4 Appendix: Definitions of variables

Variables	Definitions	Source
CSR contracting measures		
CSR contracting	Indicator variable that equals one if a firm adopts CSR contracting provision, and zero otherwise.	Form DEF 14A, SEC's EDGAR
% CSR contracting	The ratio of the actual percentage of CSR-based compensation to total CEO compensation.	Form DEF 14A, SEC's EDGAR
Firm risk measures		
Return volatility	The standard deviation of daily stock returns multiplied by the square root of 252.	CRSP
Implied volatility	Implied volatility of at-the-money (ATM) options that have 30 days to expiration and absolute values of delta between 0.4 and 0.5.	OptionMetrics
ROA volatility	The annualised standard deviation of quarterly ROAs over the last four quarters of a fiscal year.	Compustat
Firm characteristics		
Leverage	The sum of current liabilities and long-term debt divided by total book assets.	Compustat
Ln(TA)	Natural logarithm of total book assets.	Compustat
Cash/TA	The sum of cash and marketable securities, divided by total book assets.	Compustat
Dividend yield	Dividend per share divided by share price at the end of the fiscal year.	Compustat
Ln(Total compensation)	Natural logarithm of total CEO compensation.	ExecuComp
CEO chair	Indicator equals one if the CEO is also the chairman of the board of directors, and zero otherwise.	ISS
Ln(Board size)	Natural logarithm of the total number of directors on the board.	ISS
Ln(Director age)	Natural logarithm of the average age of directors on the board.	ISS
Corporate policy measures		
Leverage	The sum of long-term debt and debt in current liabilities, divided by total assets.	Compustat
R&D intensity	R&D expenditures divided by net property, plant, and equipment.	ExecuComp

Variables	Definitions	Source
Instrument		
Constituency statutes	Indicator equal to one if a firm incorporates in a state that enacts constituency statute, and zero otherwise.	Karpoff & Wittry (2018)
Firm performance measures		
Net income/SEQ	The ratio of net income to book value of equity.	Compustat
Excess return	The difference between actual and expected stock returns calculated from the 3-factor Fama-French model.	CRSP & Kenneth R. French's website (https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html)
Financial constraint measures		
KZ index	The financial constraint index of a firm is calculated following Kaplan & Zingales (1997). KZ index is constructed as -1.002CF/TA - 39.368DIV/TA - 1.315CA/TA + 3.129LEV + 0.283Q, where CF/TA is the ratio of cash flow to lagged total book assets, DIV/TA is the ratio of cash dividends to lagged total book assets, CA/TA is the ratio of cash balance to lagged total book assets, LEV is the ratio of total debts to total book assets, and Q is the ratio of market value of assets to total book assets.	Kaplan & Zingales (1997)
SA index	The financial constraint index of a firm is calculated following Hadlock & Pierce (2010). SA index is constructed as -0.737Size + 0.043Size2 - 0.040Age, where Size is the natural logarithm of min(total book assets, 4.5 billion dollars) and Age is Min(The number of years the firm is listed with a non-missing stock price on Compustat, 37 years).	Hadlock & Pierce (2010)
Corporate governance quality		
E index	The sum of six indicators that equals one if firms have each of the following antitakeover provisions: staggered boards, limits to amend bylaws, supermajority, golden parachutes, and poison pill.	Bebchuk et al. (2009) & ISS Governance
Board independence	The ratio of the number of independent directors to the board size.	ISS Director US

Variables	Definitions	Source
Block ownership	The combined ownership of all blockholders that own at least 5% of firms' shares outstanding.	ISS Incentive Lab
CEO's risk-aversion		
CEO age	The reported age of the CEO.	ExecuComp
General ability index	The index encompasses five key dimensions of a CEO's career experience, aiming to provide a comprehensive assessment. These dimensions include: (i) the number of past positions that a CEO held during his/her career; (ii) the number of firms a CEO worked; (iii) the number of 4-digit SIC industries that a CEO worked; (iv) whether the CEO held a CEO position at another firm in the past; (v) whether the CEO worked for a multi-division firm in the past.	Custódio et al. (2013) and Custódio et al. (2017)
Other variables		
Social Capital	The first principal component of the principal component analysis based on four factors: PVOTE, RESPN, ASSN, and NCCS. PVOTE is the voter turnout rate in the presidential elections for the population aged 18 and over. RESPN is the US census surveys' response rates. ASSN is the population-adjusted number of 10 different types of social organization. NCCS is the population-adjusted number of non-profit organisations without those with an international approach.	The Northeast Regional Center for Rural Development (NERCRD) of the Pennsylvania State University.

Chapter 5. Managerial stakeholder-oriented incentives and stock price crash risk

Abstract

This research examines the impact of stakeholder-oriented contracting provisions, which link CEO compensation to CSR performance criteria, on stock price crash risk. Based on our analysis of a manually collected dataset encompassing CSR contracting practises among S&P 500 companies from 2000 to 2018, we find that CSR contracting reduces the likelihood of significant stock price declines. Further analyses reveal that the effect of CSR contracting is more pronounced for firms with greater reliance on stakeholders' implicit claims, experiencing higher earnings volatility, and residing in US counties with higher levels of religiosity. Exploring the subsequent changes in accounting policy, we find evidence that incentivised CEOs tend to report more conservatively and transparently. These results shed light on the underlying mechanisms leading to the adverse effect of CSR contracting on crash risk. Overall, our findings substantiate the argument that CSR contracting incentivises CEOs to promote stakeholder-oriented investments, effectively mitigating managerial bad news hoarding through real earnings management and ultimately reducing crash risk.

5.1. Introduction

A sudden and significant drop in stock price, commonly referred to as a stock price crash, receives primary interest from regulators, investors, and researchers. Characterised by significant volatility on the left tail of the return distribution, compared to the right tail, this phenomenon is infrequent, yet capable of causing market turbulence and imposing heavy losses on investors. Finance and accounting research consistently view that the release of accumulated unfavourable news partly causes stock price crashes that correct previous stock price overvaluation (Chen et al., 2001; Jin and Myers, 2006; Hutton et al., 2009). A strand of research, originating from a theoretical study by Jin and Myer (2006), explains the occurrence of crashes based on the agency motives to accumulate adverse information. Such motives are associated with different factors, such as CEO psychological traits (Kim et al., 2016), equity-based compensation (Benmelech et al., 2010; Kim et al., 2011a), corporate tax avoidance (Kim et al., 2011b), and product market competition (Li and Zhan, 2019).

Relatedly, this study aims to deliver a fresh perspective on whether CSR contracting, a novel executive compensation scheme, affects stock price crash risk. CSR contracting has been growing quickly over the last decade, with its main objective being to draw additional managerial attention to stakeholder interest. As emphasised by Flammer et al. (2019), the presence of CSR-based compensation alleviates myopic behaviour by encouraging a balanced managerial focus on short-term and long-term value creation. Their findings raise unresolved research questions about the potential impact of CSR contracting on bad news hoarding. Specifically, if achieving short-term economic objectives, such as reported earnings, becomes relatively less important, would incentivised executives have fewer incentives to mask actual (but unpromising) performance? If this leads to a timelier revelation of information to the market, would investors react less dramatically to bad news, and thus reduce the likelihood of stock price crashes? Through which mechanisms do incentivised executives accelerate the flow of bad news to the market? To address these questions, our research sheds light on the potential effects of CSR performance accountability in addressing managerial myopia, bad news hoarding, and crash risk.

Capital market pressure has long been viewed as an effective tool to discipline CEOs. Factors such as corporate debt and threats from takeover markets alleviate the agency costs of free cash flow and improve the efficiency of executive decisions (Jensen, 1986). Nevertheless, capital market pressure also possesses short-term horizons that aggravate agency problems, in which CEOs behave myopically by focusing on immediate profits while forgoing long-term, sustainable growth opportunities (Jensen, 2005). Explaining this problem, Stein (1989) show that invisible (long-term) investments are relatively more challenging for the market to value and realise their potential, while these investments may increase operating expenses that lead to incorrect market assessment of the firm value. This problem amplifies the importance of maintaining profitable short-term investments to beat performance benchmarks and keep stock prices high, even if long-term projects are more profitable and create sustainable growth. In turn, if CEOs insist on maintaining optimal investment strategies and miss short-term performance expectations, overreactions of the market (commonly referred to as “earnings torpedo”), that hurt firm

operations and CEOs' wealth, are inevitable (Matsumoto, 2002; Skinner and Sloan, 2002).[53] Consequently, in response to the short-term horizon of the market, myopic CEOs may withhold unfavourable information about firms while buying more time to solve underlying problems. Indeed, if adverse information reaches investors, it may trigger uncertain responses, and the market may use such information to re-evaluate CEOs' skills and abilities. This outcome exacerbates undiversified CEOs' career and reputation concerns, motivating them to withhold adverse information (Kim, 1999; Jensen, 2005; Kothari et al., 2009; Benmelech et al., 2010).

To conceal bad news and mislead investors, CEOs are considerably inclined to real earnings manipulation (Graham et al., 2005).[54] Real earnings manipulation involves a set of actions in which myopic CEOs alter the underlying economic activities of firms, such as production, investments, and regular expenses, to boost short-term performance, despite knowing that this strategy may destroy firm value (Bhojraj et al., 2009). This manipulation focuses on operational activities, such as sales, production, and discretionary expenditures (Roychowdhury, 2006) and investment activities, such as R&D and innovations (e.g., Dechow and Sloan, 1991; Bushee, 1998; He and Tian, 2013; Cheng et al., 2015; Guo et al., 2019). Real earnings manipulation also encompasses CSR-related spending and investments. Regular expenditures, such as corporate donations to charities, employee safety training, and environmental protection, can be manipulated to meet economic objectives, including meeting earnings benchmarks, smoothing earnings, dealing with financial constraints, and serving CEOs' personal interests (e.g., Masulis and Reza, 2015; Cohn and Wardlaw, 2016; Caskey and Ozel, 2017; Liu et al., 2021; Xu and Kim, 2022).[55] The prevalence of short-term financial targets in executive incentive structure contributes

[53] Skinner and Sloan (2002) report that for value stocks, stock price reactions to good news and bad news are symmetric, resulting in an increase or decrease of approximately 5% in stock price. In contrast, positive earnings news for growth stocks increases the stock price by 10%, while bad news leads to a significant drop within a range of -15% to -20%. The authors refer to this sharp drop as "earnings torpedo".

[54] In a survey study by Graham et al. (2005), top executives mentioned that they would take actions to meet earnings benchmarks, such as manipulating discretionary expenses, manipulating accruals, delaying new investment projects, drawing down reserves built in previous periods, and manipulating sales and production. Hribar et al. (2006) suggest that CEOs may also increase share repurchases to inflate Earnings per share (EPS) to meet analysts' forecasts.

[55] Liu et al. (2021) report that Chinese firms that just meet or slightly beat earnings forecasts save the costs equivalent from 0.4 to 1.4 cents per share. This saving likely comes from the reduction in using SO_2 scrubbers, increasing the level of SO_2 emission intensity by 26.7% compared to the average emission intensity.

to this susceptibility of CSR-related spending. This structure often results in insufficient incentives for CEOs to maintain long-term stakeholder-oriented efforts and commitments (Flammer et al., 2019). To summarise, managerial discretion in using and spending CSR-related funds facilitates CEOs' incentives to withhold bad news.

In this context, CSR contracting, as a compensation design that aligns the interests of CEOs and stakeholders, may weaken CEOs' discretion on CSR expenditures.[56] As suggested by Flammer et al. (2019), CSR contracting increases the time horizon of CEOs and encourages them to balance their efforts for short-term and long-term value creation. In this process, incentivised CEOs should pay more attention to stakeholders' concerns, thus preserving corporate resources to safeguard stakeholders' interests. As a result, CSR-related expenditures would be less likely to be cut, and firms signal strong commitments to honour the claims of both shareholders and stakeholders. Consistent with this view, Tsang et al. (2021) show that CSR contracting encourages managers to engage in profitable, long-term projects that foster firm innovation. This effect of CSR contracting could also be stronger since socially responsible firms tend to invest in governance systems to improve, monitor, and report managerial CSR performance (Eccles et al., 2014; Derchi et al., 2020). Overall, the presence of CSR contracting provisions may curb CEOs' incentives to hide bad news via real earnings management, thus accelerating the disclosures of adverse information and subsequently reducing crash risk (Jin and Myers, 2006; Hutton et al., 2009).

On the contrary, it is possible that CSR contracting may exacerbate managerial bad news hoarding and increase crash risk. First, stakeholders, who have illiquid implicit claims against a firm, actively assess the firm's ability to honour future commitments (Cornell and Shapiro, 1987). Stakeholders usually base their assessments on accounting numbers, such as earnings, to decide whether to cooperate with the firm and at which prices. Similar to the influence observed in the

[56] CSR contracting provisions include criteria relating to employee well-being, customer and supplier satisfaction, environmental performance, community contributions, and meeting CSR ratings and ranking (Flammer et al., 2019). For example, in 2022, American Electric Power (AEP) linked 12% of the annual incentive compensation of each executive to safety and environmental compliance criteria, 10% to customer satisfaction, and 6% to culture and workforce criteria while applying a modifier (deduction) if there are any fatal forestry contractor incidents. The 2022 AEP proxy statement is available at https://www.aep.com/assets/docs/investors/AnnualReportsProxies/docs/22annrep/2023ProxyStatement.pdf

capital market, the relationships between firms and stakeholders impose significant pressure on CEOs to report good news rather than bad news. Such pressure motivates CEOs to adopt income-increasing accounting methods to improve the firm's financial image (Bowen et al., 1995). This motivation is stronger if CEOs are risk-averse since CSR investments and other initiatives can only pay off in the long run (Berrone and Gomez-Mejia, 2009; Derchi et al., 2020). Second, there are concerns about external oversight and the lack of transparency surrounding the implementation of CSR contracting (Bebchuk and Tallarita, 2022). In this sense, incorporating CSR criteria in CEO compensation may not be adequate to influence CEOs' socially responsible actions. Eventually, it can exacerbate the agency problems and serve the interests of CEOs, not stakeholders. Incentivised CEOs may use superior reported CSR performance as a disguise to hide unfavourable performance and mislead outsiders about the true prospects of firms. As a result, the effect of CSR contracting on CEOs' bad news hoarding may reverse, leading to higher stock price crash risk.

The above opposing theoretical views motivate this empirical study. Specifically, following a data collection method of Flammer et al. (2019), we construct a unique dataset delineating the use of CSR-based compensation to investigate the connection between CSR contracting and crash risk. We focus on the presence and the substantiveness of CSR contracting among S&P 500 companies from 2000 to 2018. Then, we formally test the relationship between CSR-based compensation and crash risk. To measure the presence of CSR contracting, we construct a binary variable (i.e., *CSR contracting*), which identifies whether firms adopt CSR contracting. To measure the substantiveness of CSR contracting, we construct a continuous variable (i.e., *% CSR contracting*), which measures the proportion of CSR-based compensation in total CEO compensation. To measure crash risk, following Chen et al. (2001), Hutton et al. (2009), and Kim et al. (2011a), we estimate the probability of extreme negative weekly returns, the negative coefficient of skewness, and the ratio of volatilities of negative and positive returns. We find strong evidence that the adoption of CSR contracting leads to the reduction of crash risk, both in terms of the probability of crash risk occurrence and the level of volatility observed on the downside of the return distribution, compared to the upside. Additional robustness checks consistently support the notion

that CEOs with CSR contracting provisions in their contracts are less likely to accumulate bad news, resulting in lower stock price crash risk.

However, the impact of CSR contracting on crash risk may not be the same for all firms and in all circumstances. In further analyses, we examine whether the effect of CSR contracting is heterogeneous in the cross-section. We focus on several factors that may affect managerial bad news hoarding, including firms' dependence on ongoing relationships with stakeholders (i.e., the level of implicit claims), the level of religiosity in states where firms reside, and earnings volatility. The rationale behind this analysis is that if maintaining CSR-related expenditures is vitally important due to the nature of firm business and the business environment (i.e., stakeholder relationships and religiosity), CEOs should be less likely to sacrifice these expenditures to manage earnings upward (Flammer, 2013; Chakravarthy et al., 2014; Xu and Kim, 2022). Similarly, if earnings patterns become bumpier and the fear of missing earnings expectations is heightened, CSR contracting should be more effective in discouraging managerial delay of bad news (Rountree et al., 2008; Khurana et al., 2018). Consistent with these predictions, our evidence shows that the moderating effect of CSR contracting on crash risk is more pronounced for firms that have a greater reliance on stakeholders' implicit claims, higher earnings volatility, and reside in US counties with higher levels of religiosity. This evidence supports the notion that firms tailor the designs of CSR-based compensation to align with their dependence on stakeholders and to compensate for the heightened likelihood of real earnings management that CEOs may engage in.

Due to the presence of potential omitted variable bias and reverse causality, our baseline results may not be conclusive about the causal relationship between CSR contracting and crash risk. There may be some firm-specific, or industry-specific, factors that jointly influence the adoption of CSR contracting and the reduction of crash risk. Indeed, if the corporate decision to adopt CSR contracting is endogenous, conclusions about the causal relationship would be spurious. In addition, the reverse relationship may occur when firms exhibiting lower crash risk may tie executive compensation to CSR criteria. We employ a series of robustness checks to address these concerns and establish a reliable causal relationship.

First, we employ a propensity score matching (PSM) analysis where firm-year observations with CSR contracting (i.e., the treatment group) are matched with observations without CSR contracting (i.e., the control group). We then compare the level of stock price crash risk between two groups of firms. The PSM method isolates the difference due to the presence of CSR contracting while removing all observable differences among firm-year observations. As a result, the difference in the level of stock price crash risk is more likely due to the presence of CSR contracting provisions. We continue to find the negative relationship between CSR contracting and firm risk.

Second, we perform the difference-in-differences analysis, using the first-time adoption of CSR contracting as the treatment event. Specifically, we examine a period of five years before and after the treatment event. We match firm-year observations in the treatment group with the control group, ensuring that firm-specific and stock characteristics are statistically indifferent. This procedure removes the possible impacts of observable confounders on crash risk and enables us to isolate the variation in crash risk explained by the treatment. Consistent with our baseline results, we find that CSR contracting is negatively associated with crash risk.

We further address the endogeneity concern by using an instrumental variable approach. Following Flammer et al. (2019), we use *Constituency statutes* as an instrument to isolate the exogenous effects of CSR contracting. Accordingly, *Constituency statutes* refer to statutes enacted by US states that enable managers to consider the interests of various stakeholders without breaching their fiduciary duties to shareholders. Thus, firms located in US states that enact constituency statutes are more likely to adopt CSR contracting, meaning that this instrument is relevant. Further, constituency statutes are unlikely to be associated with corporate policies and corporate information disclosures. Therefore, this instrument is likely not associated with the level of crash risk. Using *Constituency statutes* as an instrument in two-stage least square regressions, we consistently find that CSR contracting reduces crash risk.

Next, we examine the channels through which CSR contracting moderates bad news hoarding and reduces crash risk. We focus our analysis on the implementation of accounting conservatism and the transparency of corporate financial reports, since these channels determine the speed and

the accuracy of the disclosures of adverse information to investors (Basu, 1997; Jin and Myers, 2006). Our evidence shows that CEOs with CSR contracting tend to report more transparently and conservatively (i.e., a higher degree of verification is required to recognise good news versus bad news), reducing the dispersion of analysts' earnings forecasts. These findings shed light on the changes in accounting policy and information disclosure practises that accelerate the recognition of bad news when CSR contracting provisions are active.

Overall, this study makes several contributions to the literature. First, we add to the literature that links CEO compensation to stock price crash risk. Specifically, Jensen and Murphy (1990) suggest the use of equity-based compensation, including stock and option rewards, to resolve the conflict of interests between shareholders and managers. Nevertheless, making CEO compensation a function of stock price may create the myopia problem in which CEOs may sacrifice long-term performance for short-term profit (Stein, 1989). Considerable evidence supports this view by showing that equity-based compensation may lead to earnings management and tax shelter manipulation to conceal bad news (Bergstresser and Philippon, 2006; Burns and Kedia, 2006; Feng et al., 2011), thereby causing stocks to crash (e.g., Kim et al., 2011a; Kim et al., 2011b; Kim et al., 2019; Al Mamun et al., 2020). In this research, we provide another aspect of executive compensation designs, namely CSR contracting, that may offset the downside, as mentioned earlier, of equity-based compensation. Our results suggest that CSR contracting emphasises the importance of maintaining CSR-related investments that create long-term, sustainable value. This effect offsets the pressure imposed on CEOs by the capital market, thus alleviating managerial engagement in myopic actions to manage earnings upward and sacrifice long-term value creation.

Second, our research contributes to the debate on the agency costs of stakeholder engagement. On the one hand, some studies support the view that stakeholder engagement aggravates managerial short-termism. Bowen et al. (1995) show that managers have stronger incentives to adopt income-increasing accounting methods to enhance firms' financial image if ongoing implicit claims of stakeholders are significant. Similarly, Matsumoto (2002) find that firms relying more on implicit claims with stakeholders are more likely to manage earnings upward to address stakeholders' concerns. Ben-Nasr and Ghouma (2018) provide evidence that generous

employee welfare plans facilitate earnings management and bad news hoarding, while Masulis and Reza (2015) suggest that CEOs use corporate charity donations to maximise personal interests, rather than serving the interests of shareholders. On the other hand, Hui et al. (2012) suggest that close relationships with customers and suppliers incentivise managers to adopt a more conservative accounting policy and recognise losses more quickly. Analysing the outcome of stakeholder-contingent compensation, Flammer et al. (2019) support the view that CSR contracting addresses executive short-termism and contributes to superior firm performance, although Bebchuk and Tallarita (2022) express concerns about the agency problems of this incentive. By providing evidence that CSR contracting reduces crash risk through positive changes in accounting policy, we support the view that stakeholder engagement initiatives, such as linking CEO pay to CSR criteria, alleviate managerial short-termism and generate value for both shareholders and stakeholders.

Third, we contribute to a burgeoning literature on the economic implications of CSR contracting. The integration of CSR criteria in CEO compensation has been proliferating over the last decade, yet the impacts of these provisions on corporate policies and firm outcomes remain broadly unanswered. Recent studies show that CSR contracting positively impacts firm outcomes, such as enhancing CSR performance and supporting innovation activities (Flammer et al., 2019; Tsang et al., 2021). This novel compensation design also signals long-term investment strategies, attracts investors who are socially responsible, and reduces turnover-performance sensitivity (Qin and Yang, 2022). We extend this line of research by providing evidence that CSR contracting induces a more transparent and conservative reporting policy and reduces crash risk. This result is consistent with the view of Flammer et al. (2019) that CSR contracting lengthens the time horizon of executives and encourages CEOs to optimise investment strategies that create sustainable value for various stakeholders.

This study is organised as follows. Section 5.2 provides background and develops hypotheses. Section 5.3 describes the data sample, variable construction, and research settings and provides summary statistics. Section 5.4 discusses the baseline results, robustness checks, and cross-sectional heterogeneity analysis. Section 5.5 addresses endogeneity concerns. Section 5.6

examines the mechanisms leading to the relationship. Section 5.7 summarises the empirical findings and concludes.

5.2. Background and hypothesis development

5.2.1. Crash risk and managerial incentives to withhold bad news

The distribution of aggregate returns for a stock exhibits an asymmetry, with more significant volatility observed on the downside of the distribution, compared to the upside. In this sense, a stock price crash is defined as the occurrence of large, negative return outliers (Chen et al., 2001). Prior studies present different views on the factors and mechanisms leading to stock crashes. From the market-based perspective, Chen et al. (2001) posit that the heterogeneity of market participants' opinions of the stock value explains the greater variance on the downside of the return distribution. In their two-period model, bearish investors possess negative signals about a firm's performance, but they face constraints on short-selling, which induce them to sell their positions and stay out of the market. As a result, adverse information accumulates without being fully reflected in stock prices during the first period. In the second period, some bad news may emerge, putting downward pressure on stock prices and causing bullish investors to exit the market. At a specific point in time, previously bearish investors start buying shares at a specific price that reveals accumulated hidden information. This revelation triggers adverse investors' responses and higher return volatility, thereby contributing to a more negatively skewed return distribution and increasing the risk of a stock price crash.

A more recent, alternative explanation of crash risk by Jin and Myers (2006) focuses on managerial incentives to maximise personal interests. According to their model, managers take advantage of corporate opacity to capture a part of firms' internal cash flows. As a result, managers must absorb a portion of firm-specific variance (i.e., idiosyncratic risk), which may include both positive and negative information about firm performance. Nevertheless, the amount of negative information that managers can absorb is limited. If the hidden information accumulates over an extended period and becomes too costly and difficult to conceal, managers may abandon the information absorption and release all accumulated bad news. This revelation is likely to trigger a stock crash, since investors previously hold optimistic views regarding firms' prospects.

Supporting Jin and Myers's (2006) model, Hutton et al. (2009) show that managers actively manipulate earnings through discretionary accruals to disguise bad news, thereby increasing the likelihood of stock crashes. Other empirical studies further support the hypothesis of "hidden negative information" and identify that managerial bad news hoarding exacerbates the stock price crash risk. For instance, some factors such as designs of equity-based compensation (Kim et al., 2011a), corporate tax avoidance (Kim et al., 2011b), and the readability of financial reports (Kim et al., 2019) are proven to be related to managerial withholding of bad news and stock crashes.

When deciding whether to disclose bad news voluntarily, CEOs weigh the costs and benefits associated with controlling the flow of information to the public. On the one hand, CEOs may speed up revealing bad news if keeping it hidden results in expensive lawsuits and harms their reputation (Skinner, 1994; Kasznik and Lev, 1995; Skinner, 1997). Specifically, delaying bad news can catch the market participants off guard and result in substantial trading losses for uninformed investors. As a result, CEOs are likely to face legal liabilities in subsequent lawsuits, while their firms' operations may be disrupted by authority investigation. Skinner (1994) suggests that early disclosures of bad news weaken the plaintiffs' arguments and reduce the costs of later settlements. Moreover, if CEOs initially conceal bad news and correct this action through subsequent restatements, the firms and CEOs may suffer significant reputational damages. Reputational damages may further deteriorate firms' competitiveness and financial performance. For example, capital providers (e.g., creditors) may impose higher financing costs due to the violation of explicit contracts that require timely and truthful information disclosure. The costs of transacting with key stakeholders (e.g., employees, customers, suppliers) may also increase as firms need to compensate for losing stakeholders' trust in firms' abilities to honour future claims (Chakravarthy et al., 2014). Furthermore, culpable CEOs may encounter civil and criminal responsibilities, leading to a decline in future career prospects and personal wealth (Karpoff and Wittry, 2018).

On the other hand, CEOs may deliberately withhold unfavourable information and buy more time to address underlying problems. First, adverse information may be withheld because it communicates to outsiders regarding the firm's inability to meet economic goals, such as earnings

benchmarks and expected earnings growth trends. If such failures have not been disclosed through mandatory disclosures, subsequent voluntary disclosures of bad news may trigger additional information acquisition by market participants (Nagar, 1999; Kim, 1999). The market then uses additional information to re-evaluate managers' skills and perceive the potential failures as managerial shortcomings. Due to the uncertainty of consequences for their career, risk-averse CEOs may choose to avoid disclosing adverse information (Nagar, 1999; Kim, 1999). Supporting this view, Kothari et al. (2009) emphasise that CEOs face asymmetric payoffs when revealing bad news versus good news. They argue that while disclosing good news is associated with continued employment and stable compensation, disclosing bad news can have devastating consequences on CEOs' careers, such as the termination of the current employment, loss of current income and future career opportunities. Furthermore, while equity-based compensation is commonly viewed as an effective way to align CEOs' interests with those of shareholders (Jensen and Murphy, 1990), CEOs may shelter bad news by temporarily boosting reported earnings to increase the value of their equity portfolio (Bergstresser and Philippon, 2006; Benmelech et al., 2010), especially when they receive substantial option compensation (Burns and Kedia, 2006; Kim et al., 2011a). Maintaining a personal reputation is another crucial factor that motivates CEOs to conceal bad news. Ball (2009) identify that CEOs are driven by the desire to uphold their standing among peers, colleagues, and the public, which motivates them to engage in financial fraud to conceal poor performance.

5.2.2. Why does CSR contracting reduce managerial incentives to hoard bad news?

The need to hoard bad news can incentivise CEOs to engage in myopic actions, such as earnings management. By inflating earnings and portraying a positive image of the company's performance, CEOs can distort investors' perception of firms' prospects, mitigating the adverse effects of withheld negative information (Healy and Wahlen, 1999). In this sense, earnings management intensifies the ambiguity in firms' true financial results. This limits the detailed adverse information available to investors and reduces idiosyncratic risk by transferring specific risks to CEOs. However, it also increases the potential for stock price crashes (Jin and Myers, 2006; Bleck and Liu, 2007; Hutton et al., 2009). Notably, other factors also motivate the

manipulation of reported earnings. These factors include avoiding dramatic market overreaction (Skinner and Sloan, 2002; Graham et al., 2005; Bleck and Liu, 2007), maximising managerial equity portfolios (Bergstresser and Philippon, 2006; Bleck and Liu, 2007), improving stakeholders' perception about firms' financial health (Bowen et al., 1995), and enhancing access to external capital (Strobl, 2013).

A survey study conducted by Graham et al. (2005) reveals that the majority of top executives are inclined to manipulate real activities to inflate earnings. On the one hand, it is evident that myopic CEOs face a trade-off between fulfilling short-term earnings expectations and fostering long-term, sustainable growth through real earnings management (e.g., Roychowdhury, 2006; Bhojraj et al., 2009). On the other hand, CEOs find this strategy appealing over other techniques to meet earnings benchmarks, for several reasons.[57] First, CEOs have complete discretion over discretionary expenses and are willing to forgo them to inflate reported earnings (Benmelech et al., 2010). Second, unlike the use of accounting accruals that reverse in subsequent periods, detecting and quantifying real earnings management pose challenges for analysts, investors, and regulators (Graham et al., 2005; Roychowdhury, 2006). Last, and perhaps most importantly, CEOs do not receive sufficiently strong incentives to maintain certain types of discretionary expenditures, such as CSR investments, which only pay off in the long run. This incomplete contracting problem allows CEOs to exploit and prioritise short-term earnings objectives, rather than pursuing superior long-term performance.

Meanwhile, stakeholder-oriented spending is one of the various real activities that are susceptible to manipulation by myopic CEOs.[58] Prior studies show that CEOs actively control CSR expenditures and investments, and such discretion may destroy both shareholder and stakeholder value. For example, Masulis and Reza (2015) find substantial evidence that corporate giving to

[57] CEOs may guide analysts' expectations down to a beatable level, but gloomy analysts' expectations may entail the costs of low stock prices that harm CEOs' shareholdings of firms (Matsumoto, 2002). Hutton et al. (2009) suggest that managers may also use accounting accruals to hide bad news, leading to a higher risk of stock crashes.

[58] Myopic CEOs may manipulate operational activities by offering abnormal discount programmes and lenient credit terms, reducing discretionary expenditures for employee training and maintenance, or adjusting the production level to improve reported operating margins (Roychowdhury, 2006). Besides, considerable empirical evidence suggests that myopic CEOs may forgo positive NPV projects, such as R&D investments, to boost short-term earnings (e.g., Dechow and Sloan, 1991; Bushee, 1998).

charities is positively associated with agency motives to maximise personal interests. Cohn and Wardlaw (2016) find that workplace safety deteriorates when firms are highly financially constrained. This finding is consistent with Caskey and Ozel (2017), who show that managers reduce explicit and implicit safety expenses to meet or beat earnings benchmarks. Additionally, Liu et al. (2021) show that earnings pressure discourages Chinese firms from addressing toxic gas emissions in their production. Similarly, Cohn et al. (2021) show that a decrease in managers' short-termism, as observed following private equity buyouts, is associated with improvements in workplace safety.

One may question whether CEOs have fewer incentives to manage earnings upward if firms formally hold CEOs responsible for stakeholder-oriented expenditures and periodically monitor performance. A recent development in corporate practice that links CEO compensation to pre-determined CSR metrics, namely CSR contracting, supports this possibility. Accordingly, CSR contracting incentivises CEOs to consider the interests of salient stakeholders in setting corporate policies (e.g., investments, operations) and discipline their use of corporate resources. In this sense, firms counter managerial short-termism and pursue long-term value creation in which the important roles of stakeholders are seriously considered (Flammer et al., 2019). To meet CSR targets, incentivised CEOs must allocate specific human and financial resources to CSR investments. This mechanism reduces managerial flexibility in managing earnings upward and withholding bad news. The moderating effect is stronger if firms correspondingly invest in governance systems to improve, monitor, and report managerial CSR performance (Eccles et al., 2014; Derchi et al., 2020). Overall, CSR contracting may curb managerial incentives to hide bad news through real earnings management, thus decreasing stock price crash risk. We formulate the following hypothesis.

Hypothesis 1: CSR contracting reduces crash risk.

If incentivised CEOs are less likely to behave myopically, there must be channels through which bad news is communicated quickly to market participants. We conjecture that incentivised CEOs adopt an alternative, more conservative accounting policy that accelerates the disclosure of unfavourable news. Accordingly, Basu (1997) define conditional conservatism in reporting as

managers' tendency to require a higher (lower) degree of verification to recognise good (bad) news as gains (losses). Firms following a conservative accounting policy tend to reflect bad news as earnings losses swiftly. As a result of this asymmetric timeliness of earnings in recognising bad news compared to good news (Basu, 1997), bad news is conveyed more quickly to investors and analysts. Supporting this concept, Kim and Zhang (2016) find that firms with more conservative accounting policies offset managers' tendency to delay bad news, thereby reducing crash risk. In this vein, if CEOs committing to CSR performance targets are less likely to withhold bad news, we should expect them to report more conservatively.

Hypothesis 2: CSR contracting induces CEOs to report more conservatively.

Another channel allowing investors to update adverse information swiftly is through the enhanced transparency of firms' financial reports. According to Jin and Myers (2006), the opacity surrounding firm performance allows CEOs to absorb firm-specific variance and capture firms' cash flow. As a result, adverse information is accumulated over time. In line with Jin and Myers (2006), Hutton et al. (2009) find that the lower level of firm transparency, as measured by the level of discretionary accruals, facilitates bad news hoarding and aggravates the probability of stock price crashes. Therefore, we conjecture that CEOs with CSR contracting may adopt a more transparent reporting approach that accelerates the revelation of bad news. Following Jin and Myers (2006), we utilise the dispersion of analysts' earnings forecasts as an indicator of a firm's financial report transparency. If CEOs are less likely to manufacture earnings, analysts should receive higher-quality information promptly, thus issuing less dispersed forecast numbers.

Hypothesis 3: CSR contracting induces CEOs to report more transparently.

Even when the presence of CSR contracting makes firms less prone to crashes, this moderating effect may not be equal in all circumstances. First, the extent to which firms rely on the continuation of relationships with stakeholders may influence the likelihood of CSR contracting adoption and CEOs' incentives to manage earnings. On the one hand, maintaining strong stakeholder engagement is costly and requires long-term efforts (Eccles et al., 2014). On the other hand, this endeavour pays off by improving firms' reputation capital, bolstering firms'

profitability, and shielding firms from idiosyncratic and systemic shocks. (e.g., Cornell and Shapiro, 1987; Albuquerque et al., 2019). For firms that heavily rely on ongoing relationships with stakeholders, such as those with principal customers, the net benefits from engaging with customers are positive (i.e., the overall benefits are more significant than the costs). In this vein, stakeholder-dependent firms should be more likely to adopt CSR contracting, and this provision should be provided more substantially. In this case, CSR contracting should effectively offset managerial preference to accumulate bad news.

Hypothesis 4: The negative impact of CSR contracting on crash risk is more significant for firms having higher stakeholders' implicit claims.

The stability of earnings is another factor that may influence the effect of CSR contracting on crash risk. Bumpy earnings paths deteriorate the predictability of future earnings and render investors' and analysts' estimations of firm value inaccurately (Graham et al., 2005; Dichev and Tang, 2009). Firms with volatile earnings are also perceived to be riskier and have questionable viability, thus having less analyst following, lower stock prices, and higher costs of capital (Jung et al., 2013; Khurana et al., 2018). As a result, CEOs at firms with high earnings volatility have stronger incentives to smooth earnings via real activities management (Khurana et al., 2018). In this context, the threats imposed on stakeholder-oriented investments are more substantial, suggesting that the presence of CSR contracting provisions in CEO contracts would be more effective in safeguarding stakeholders' interests. Following this logic, we conjecture that CSR contracting is more effective in reducing crash risk when earnings volatility is high.

Hypothesis 5: CSR contracting is more impactful in reducing crash risk for firms having higher earnings volatility.

Hilary and Hui (2009) argue that stakeholders in US counties with higher religiosity are more risk-averse. In other words, if firms' viability is questionable and the likelihood that firms renege on implicit claims is high, these stakeholders may react more strongly, thus imposing severe damages on firms' sales and operations. Restraining managerial discretion on CSR-related expenditures, thus, becomes crucial for firms operating in a highly religious environment. CSR

contracting, therefore, should be designed to be more appropriate and substantially to curb myopic bad news hoarding and protect stakeholders' interests. In this vein, we conjecture that religiosity would strengthen the adverse relationship between CSR contracting and bad news hoarding.

Hypothesis 6: CSR contracting is more impactful in reducing crash risk for firms in US counties with higher religious adherents.

5.3. Data sample and methodology

In this section, we describe the construction of the main variables used in this study, including measures of CSR contracting and stock price crash risk. We also discuss control variables included in the baseline analysis and the instrumental variable that we use to check the robustness of baseline results. Then, we discuss our baseline identification and provide summary statistics and a correlation matrix between variables.

5.3.1. Sample selection

As discussed in Section 1.4 of Chapter 1, we utilise hand-collected data from firms' proxy statements, which provide details about the use and designs of CSR contracting. Specifically, we extract details of CSR contracting provisions from annual proxy statements (Form DEF 14A) filed with the US Securities and Exchange Commission (SEC). We focus on the "Compensation discussion and analysis" section. Our focus is on the inclusion of CSR metrics in CEOs' compensation, rather than that of other executives. This approach avoids potential bias stemming from firms providing CSR-based compensation to non-CEO executives who lack the power to influence corporate policies and the subsequent levels of crash risk.

This chapter focuses on firms that constitute the Standard & Poor's 500 (S&P 500) index. For a specific fiscal year, only firms listed in the index are retained in our data sample. In other words, a firm can disappear in one year and reappear in other years to reflect the fact that firms can move in and move out of the S&P 500 index after periodical adjustments of the index. Similar to previous chapters, we begin the sample period from 2000 to avoid the impacts of data issues

associated with pre-2000 proxy statements in SEC's EDGAR platform.[59] We end our sample period in 2018 because the occurrence and spread of the COVID-19 pandemic (from 2019 to 2023) may confound the potential effects of CSR contracting on crash risk.

Our initial sample consists of 9208 firm-year observations. We supplement this dataset by merging it with information from other data sources. Specifically, the financial and accounting data comes from Compustat. The data on CEO and board characteristics are from the Institutional Shareholder Services (ISS) database. Stock prices and the number of shares outstanding are from CRSP. Non-financial information, such as the number of a firm's employees, is from Compustat. In the next step, we drop all observations with missing values for variables included in the baseline specifications, while removing observations with invalid values, such as negative total book assets and firm sales. To reduce the potential impact of outliers, all control variables are winsorized at the 1st and 99th percentiles. After applying all these conditions, our final sample consists of 7217 firm-year observations, in which 1961 firm-year observations have connections with CSR contracting provisions. This sample size is consistent with the size of the data sample used in Flammer et al. (2019) and the size of data samples constructed in previous chapters of this thesis.

5.3.2. Variable construction and empirical specification

5.3.2.1. CSR contracting

To search for the relationship between CSR contracting and crash risk, we hand-collect data and construct two measures of CSR contracting. Following Flammer et al. (2019), we construct a dummy variable (i.e., *CSR contracting*) that equals one if a firm's CEO has CSR contracting criteria in his compensation in a fiscal year, and zero otherwise. As discussed in Section 1.4.1 of Chapter 1, we follow Flammer et al. (2019) and decide that firms have CSR contracting provisions if at least one of the following criteria is integrated into CEOs' compensation: "Community, Compliance with ethical standards, CSR, Diversity, Employee well-being, Energy efficiency, Environmental compliance, Environmental goals, Environmental performance, Environmental

[59] We find a large number of missing values (exceeding 10%) for CSR contracting variables before 2000, which is attributed to the challenges of accessing and collecting pre-2000 proxy statement data from SEC's EDGAR platform.

projects, Greenhouse gas emissions reductions, Health, Performance relative to a corporate responsibility index, Product safety, Reduce injury rates, Safety, and Sustainability" (Flammer et al., 2019, p.1105).

A second measure of CSR contracting is the share of this provision in CEO compensation, or *% CSR contracting*. We construct *% CSR contracting* by taking the ratio of the actual payout of CSR-based compensation to total CEO compensation. For firms that do not adopt CSR contracting, *% CSR contracting* equals 0. We mark corresponding observations as missing for firms that adopt CSR contracting but do not specify the amount of CSR-based compensation.

5.3.2.2. Measuring crash risk

Since we focus on the impact of a firm-level factor (i.e., the inclusion of CSR criteria in executive compensation) on firm-specific crash risk, we follow the literature on crash risk and construct different measures of crash risk, based on firm-specific weekly returns, after removing the market components that explain firms' stock returns. Following Hutton et al. (2009) and Chen et al. (2001), we first calculate the firm-specific weekly return, *W*, by taking the natural logarithm of one plus the residual, ϵ, where the residual is estimated from the following market regression:

$$return_{i,t} = \alpha + \beta_{1i} return_{m,t-2} + \beta_{2i} return_{m,t-1} + \beta_{3i} return_{m,t} + \beta_{4i} return_{m,t+1} + \beta_{5i} return_{m,t+2} + \epsilon_{i,t}$$

where $return_{i,t}$ is a weekly return of stock i in week *t*. $return_{m,t}$ is the CRSP value-weighted market index's return in week *t*. The inclusion of two leads and lags of the marker return is to account for the impact of non-synchronous trading of infrequently traded stocks (Dimson, 1979). As a result, $W_{i,t}$ is calculated as $\ln(1 + \widehat{\epsilon_{i,t}})$. To alleviate the bias caused by measurement errors, we require a specific firm year to have return data for at least 26 weeks. All firm years with less than 26 weeks are removed from the data construction process.

In the second step, we construct three common-used measures of stock price crash risk based on firm-specific weekly return $W_{i,t}$. Our first measure of crash risk is the negative coefficient of skewness, or *NCSKEW*. This measure captures the skewness of the return distribution of a stock.

If *NCSKEW* is larger, the return distribution would be more skewed to the left. In other words, the left tails of the return distribution are thicker, suggesting that extreme negative returns are more likely to occur. Following Chen et al. (2001), for each firm in a specific year, we calculate *NCSKEW* by taking the negative of the third moment of $W_{i,t}$ scaled by the standard deviation of $W_{i,t}$ raised to the third power, as follows:

$$NCSKEW_{i,u} = \frac{-n(n-1)^{\frac{3}{2}}\Sigma W_{i,t}^3}{(n-1)(n-2)\left(\Sigma W_{i,t}^2\right)^{\frac{3}{2}}}$$

where *n* is the number of firm-specific weekly returns in year *u*.

The second measure of crash risk is down-to-up volatility, or *DUVOL*. For each firm in each fiscal year, we separate the corresponding observations into two groups. The first group consists of firm-specific returns that are higher, or equal to, the period mean (i.e., "up" weeks), and the second group includes firm-specific returns that are lower than the period mean (i.e., "down" weeks). Following Chen et al. (2001), we calculate the standard deviations of these groups separately and take the natural logarithm of the ratio of "down" weeks to "up" weeks. Like the construction of *NCSKEW*, we require each firm-year to have at least 26 weeks to avoid the scenario that the number of available weeks is too small, causing large measurement errors. Besides, the rationale for using this measure is similar to *NCSKEW* in that they aim to capture the asymmetry of the return distribution. If the value of *DUVOL* is more significant, a stock return tends to fluctuate wider if the return itself is negative. This means that stock returns are more left-skewed distributed. Indeed, we show that the correlation coefficient between *NCSKEW* and *DUVOL* is high. In this study, we use *NCSKEW* and *DUVOL* as our main measures of crash risk.

Our last measure is *Crash,* which aims to identify firm-specific weekly returns $W_{i,t}$ that are several standard deviations smaller than the mean $W_{i,t}$, thus creating severe losses for investors. Following Kim et al. (2011a, 2011b), we set *Crash* equals one if a firm in a fiscal year experiences one or more weeks having $W_{i,t}$ that are 3.2 standard deviations below the mean of $W_{i,t}$, which represents a frequency of 0.07% in the normal distribution, and zero otherwise. In this sense, *Crash* captures the likelihood of large share price declines in a fiscal year. Although Hutton et al.

(2009) choose a threshold of 3.09 standard deviations (which represents a frequency of 0.1% in the normal distribution), choosing 3.2 standard deviations gives us a more conservative option.[60] In this study, we use *Crash* as an alternative measure of crash risk in our robustness checks (Section 5.4.2).

5.3.3. Empirical specification

To establish the relationship between the adoption of CSR contracting and crash risk, we regress measures of crash risk on measures of CSR contracting and other control variables. As described above, this study uses *NCSKEW* and *DUVOL*, which are continuous variables, to represent crash risk in most of our analyses. Consistent with previous studies, we use OLS regressions for *NCSKEW* and *DUVOL*. Overall, the baseline specification is as follows:

$$Crash\ risk_{i,t} = \beta \times CSR\ contracting_{i,t-1} + \gamma X_{i,t-1} + industry_i + year_t + \epsilon_{i,t} \quad (1)$$

where *Crash risk* includes *NCSKEW* and *DUVOL*. CSR contracting measures include *CSR contracting* and *% CSR contracting*, as described in Section 5.3.2.1. *X* is a vector of control variables. $Industry_i$ and $year_t$ are industry- and year-fixed effects, respectively. The dependent variable is measured at time *t*, while all regressors are measured at time *t-1*. Including control variables and fixed effects in the baseline model reduces the possible bias caused by omitted factors (including time-variant and time-invariant factors) that correlate with crash risk and CSR contracting measures. In addition, because firm-year observations of a specific firm may correlate with each other, we cluster all standard errors at the firm level.

Regarding control variables, we control for factors related to firm-level crash risk in the baseline specification. Chen et al. (2001) summarise different theories explaining the left skewness of the return distribution. First, the volatility-feedback mechanism indicates that when a large piece of bad news reaches the market, return volatility would be higher, and investors subsequently require a higher risk premium. This effect moves in the same direction as the negative, direct impact of bad news on stock return, thus amplifying the overall effect of bad news on the left tail's thickness. In contrast, when a large piece of good news reaches the market, the direct effect of good news is

[60] The overall results do not change if we use 3.09 standard deviations instead of 3.2 standard deviations.

offset by the effect of a higher risk premium required for higher volatility, thus resulting in the thinner right tail of the return distribution. In other words, firms with higher past stock return volatility are more prone to crash. Therefore, following Chen et al. (2001), we control for the past volatility of firm-specific return $W_{i,t}$, or *Sigma*.

Second, a firm stock bubble may increase the likelihood of large, negative returns (Blanchard and Watson, 1982). Strong market conditions and exuberant investor behaviour may inflate a stock price more than its intrinsic value. At some point in the future, the price bubble bursts, resulting in a significant decline in stock price and severe losses to investors. Simply put, firms with high past returns would be more likely to crash. Thus, we control for the past firm-specific return, *Ret*.

Third, a model by Stein and Hong (1999) shows that investors' heterogeneous opinions may also lead to price crashes. The underlying mechanism is similar to the argument of Chen et al. (2001) in Section 5.2.1, which includes the behaviour of bearish investors, bullish investors, and risk-neutral arbitrageurs. Stein and Hong (1999) posit that an abnormally high trading volume tends to follow a pronounced difference in investors' opinions. Thus, the strong trading volume would indicate investors' heterogeneity and predict negative skewness of the return distribution. Following this vein, we control for the past trading volume, *Dturn*, of firms' stocks.

Consistent with prior literature on stock price crash risk (e.g., Hutton et al., 2009; Kim et al., 2011a; Kim et al., 2011b), we use other firm-level control variables related to firms' financial performance and governance environment. In particular, the variable *Ln(Sales)* is the natural logarithm of total sales. The variable *ROA* is earnings before interests and taxes (EBIT) scaled by total assets. The variable *Market leverage* is the sum of debts in current liabilities and long-term debt scaled by the market value of assets. The variable *CEO chair* is a dummy variable that equals one if the CEO is the board's chairman, and zero otherwise. The variable *Board independence* is the number of independent directors divided by the total number of directors on the board. To reduce the potential impact of outliers, all control variables are winsorized at the 1st and 99th percentiles. Overall, by controlling for these factors, we reduce the possibility that omitted factors drive our empirical findings. Definitions of all dependent and independent variables are provided in the Appendix.

5.3.4. Summary statistics

Panel A of Table 5.1 provides descriptive statistics of the main variables used in this research. In particular, descriptive statistics of each variable are provided in groups for the full sample (Column 1), a sub-sample of firms not adopting CSR contracting (i.e., *CSR contracting* = 0) (Column 2) and a sub-sample of firms adopting CSR contracting (i.e., *CSR contracting* = 1) (Column 3). Then, we compare statistics between the above sub-samples to identify signals that support our hypotheses.

The full sample means of crash risk measures, *NCSKEW* and *DUVOL*, are 0.271 and 0.084, respectively. When aggregating *NCSKEW* and *DUVOL* by *CSR contracting*, the mean values of these variables are not statistically different from each other, given the corresponding t-statistics of 1.3 and -0.3. Meanwhile, the mean value of *Crash* is 0.192 for the full sample, meaning that the unconditional probability of a crash is 19.2% on average. Consistent with our conjecture, firms that link CEOs' compensation to CSR criteria are statistically less prone to crash. Indeed, the probability of a crash for a group of firms without CSR contracting is 19.9%, which is statistically greater than that of firms adopting CSR contracting (i.e., 17.3%). In addition, firms with CSR contracting tend to have smaller detrended stock trading volume (0.048 versus 0.063) and lower firm-specific weekly volatility (0.033 versus 0.039). Given that the probability of a crash is statistically smaller when firms adopt CSR contracting, the statistics of trading volume and return volatility are consistent with prior literature that firms with higher investor heterogeneity and higher volatility are more prone to crash (e.g., Stein and Hong, 1999; Chen et al., 2001). In contrast, firms adopting CSR contracting have higher means of weekly returns (-0.066 versus -0.096), which is not in line with the prediction that firms with higher past returns tend to crash more in the future (Blanchard and Watson, 1982).

Regarding firm-specific characteristics, firms using CSR contracting are significantly larger, as indicated by firm sales. This aligns with Waddock and Graves (1997), suggesting that larger and mature firms are more inclined to adopt CSR contracting when facing greater public scrutiny. CSR contracting adopters are also less profitable (measured by *ROA*) (0.095 versus 0.107) and more leveraged (0.193 versus 0.15). Regarding governance control variables, firms with CSR

contracting tend to have better governance quality, since they are less likely to have CEO duality and have a higher percentage of independent directors on the boards. This is in line with Hong et al. (2016), who find that the presence of CSR contracting is positively associated with strong corporate governance.

In Panel B of Table 5.1, we provide the correlation matrix of dependent and independent variables. As expected and consistent with previous studies on crash risk, all three measures of crash risk are strongly correlated with each other. Otherwise, the reported correlation coefficients between variables are relatively small, all below 0.5, indicating no significant concern for multicollinearity. Taken together, measures of CSR contracting are negatively correlated with measures of crash risk. This result lends initial support to our main hypothesis about the negative association between CSR contracting and crash risk.

5.4. CSR contracting and crash risk: Baseline results and robustness checks

5.4.1. Baseline results

We start our analysis by examining whether the presence of CSR contracting provisions in CEO contracts reduces managerial bad news hoarding and the subsequent level of crash risk. Following our baseline specification described in Section 5.3.3, we regress measures of crash risk on measures of CSR contracting (i.e., *CSR contracting* and *% CSR contracting*) and report results in Table 5.2. We use OLS regression with industry and year-fixed effects where *NCSKEW* and *DUVOL* are the dependent variables. We use the Fama-French 48 industry classification to construct the industry fixed effects.

As reported in Table 5.2, we consistently find that the coefficients of *CSR contracting* and *% CSR contracting* are negative and significant across regression. These results suggest that stocks of firms adopting CSR contracting are less likely to crash, since the subsequent downside volatility of the return distribution decreases. Moreover, the impacts of CSR contracting on measures of crash risk are economically significant. In particular, the coefficient of *CSR contracting* is -0.057 in Column 1 and -0.02 in Column 3, meaning that introducing CSR criteria in CEO compensation reduces *NCSKEW* and *DUVOL* by 0.057 and 0.02, respectively. Considering that the sample

Table 5.1. Descriptive statistics

This table provides summary statistics for variables included in the baseline regression. Panel A provides basic statistics, including means and standard deviations, of measures of crash risk, CSR contracting, and control variables of all S&P 500 companies from 2000 to 2018. The statistics are provided for two sub-samples of firms without (Column 1) and with (Column 2) CSR contracting (i.e., CSR contracting = 0 and CSR contracting = 1). Except for measures of crash risk, all other variables' one-year lagged statistics are reported to be consistent with the baseline specification. We compare summary statistics between two sub-samples by taking the difference between values and providing corresponding t-statistics. Panel B reports Pearson correlation coefficients between variables. All variables are defined in the Appendix.

Panel A. Summary statistics

Variables	Full sample (1)		CSR contracting = 0 (2)		CSR contracting = 1 (3)		Difference (2) - (3)
	N= 7217		N= 5256		N= 1961		
	Mean	SD	Mean	SD	Mean	SD	
Crash measures							
NCSKEW	0.271	1.028	0.28	1.07	0.245	0.908	0.036
DUVOL	0.084	0.408	0.083	0.418	0.086	0.38	-0.003
Crash	0.192	0.394	0.199	0.4	0.173	0.379	0.026**
CSR contracting measures							
% CSR contracting$_{t-1}$	0.004	0.014	0	0	0.033	0.029	-0.033***
Other control variables							
Dturn$_{t-1}$	0.059	0.308	0.063	0.312	0.048	0.296	0.015*
Sigma $_{t-1}$	0.037	0.022	0.039	0.023	0.033	0.018	0.006***
Ret $_{t-1}$	-0.088	0.125	-0.096	0.133	-0.066	0.095	-0.03***
Sales $_{t-1}$	19178.889	36844.579	15761.492	26221.153	28338.419	55129.31	-12576.93***
Ln(Sales) $_{t-1}$	9.06	1.181	8.918	1.167	9.438	1.133	-0.52***
ROA $_{t-1}$	0.104	0.076	0.107	0.078	0.095	0.07	0.013***

(continues)

(continued)

Variables	Full sample (1)		CSR contracting = 0 (2)		CSR contracting = 1 (3)		Difference (2) - (3)
	N= 7217		N= 5256		N= 1961		
	Mean	SD	Mean	SD	Mean	SD	
Mkt. Leverage $_{t-1}$	0.161	0.126	0.15	0.126	0.193	0.121	-0.043***
CEO chair $_{t-1}$	0.683	0.465	0.696	0.46	0.649	0.478	0.047***
Board independence $_{t-1}$	0.787	0.127	0.772	0.134	0.826	0.099	-0.054***

Panel B. Correlation matrix

	Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1)	NCSKEW	1												
(2)	DUVOL	0.951	1											
(3)	Crash	0.64	0.603	1										
(4)	CSR contracting$_{t-1}$	-0.015	0.005	-0.03	1									
(5)	% CSR contracting$_{t-1}$	-0.019	-0.007	-0.032	0.706	1								
(6)	Dturn$_{t-1}$	-0.031	-0.055	-0.014	-0.026	-0.022	1							
(7)	Sigma $_{t-1}$	-0.013	-0.034	-0.014	-0.125	-0.059	0.283	1						
(8)	Ret $_{t-1}$	0.014	0.032	0.018	0.101	0.041	-0.266	-0.962	1					
(9)	Ln(Sales) $_{t-1}$	0.002	0.014	-0.008	0.208	0.128	-0.023	-0.192	0.164	1				
(10)	ROA $_{t-1}$	0.068	0.061	0.066	-0.081	-0.074	-0.029	-0.101	0.11	-0.035	1			
(11)	Mkt. Leverage $_{t-1}$	-0.053	-0.046	-0.055	0.15	0.128	0.119	0.002	-0.005	0.097	-0.377	1		
(12)	CEO chair $_{t-1}$	0	-0.006	-0.019	-0.057	-0.068	0.041	0.062	-0.064	0.084	-0.067	0.04	1	
(13)	Board independence$_{t-1}$	-0.025	0.002	-0.011	0.216	0.133	-0.056	-0.218	0.191	0.195	-0.086	0.088	0.016	1

means for *NCSKEW* and *DUVOL* are 0.27 and 0.084, respectively, these reductions translate to a substantial decrease of 21.11% and 23.8%, respectively, in crash risk measures. When we change the main regressor to *% CSR contracting*, we also achieve similar results where one standard deviation of *% CSR contracting* (1.4%) causes 0.031 $(= -2.226 \times 0.014)$ and 0.013 $(= 0.947 \times 0.014)$ drops in *NCSKEW* and *DUVOL*. In summary, our findings suggest that the adoption of CSR contracting significantly reduces the probability of a stock price crash, manifested by a decrease in the left-tail thickness of the return distribution, compared to the right-tail thickness. These results, thus, lend support to the notion that CEOs are less likely to accumulate bad news when they are incentivised by CSR pay.

The signs of other control variables are generally consistent with previous studies on crash risk. Specifically, firm profitability (measured by *ROA*) is significantly correlated with *NCSKEW* and *DUVOL*. The positive sign of *ROA*'s coefficient is consistent with the stochastic bubble theory in Chen et al. (2001), in which high profitability inflates stock prices (i.e., a stock price "bubble" is built up). The formation of this price bubble may be due to managerial delaying of bad news disclosure, while managers may accelerate good news. When adverse information hits the market, the inflated stock price drops significantly (i.e., the "bubble" bursts) toward its intrinsic value and causes large negative returns for investors. We also find that market leverage is negatively associated with crash risk, which is similar to the results of Hutton et al. (2009) and Kim et al. (2011a). The reason might be that firms that are less prone to crash risk are able (or more willing) to raise more debt capital (Hutton et al., 2009).

Table 5.2. CSR contracting and stock price crash risk

This table examines whether CSR contracting affects crash risk by using OLS regressions. The dependent variables are *negative skewness (NCSKEW)* and *down-to-up volatility (DUVOL)*, as specified in Section 5.3.2.2. The main explanatory variables are *CSR contracting* and *% CSR contracting*. *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. Industry- and year-fixed effects are included in all regressions. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the Appendix.

Variables	NCSKEW		DUVOL	
	(1)	(2)	(3)	(4)
CSR contracting$_{t-1}$	-0.057**		-0.020*	
	(-1.98)		(-1.74)	
% CSR contracting$_{t-1}$		-2.226***		-0.947**
		(-2.62)		(-2.54)
Dturn$_{t-1}$	-0.010	0.010	-0.019	-0.006
	(-0.23)	(0.21)	(-1.12)	(-0.31)
Sigma $_{t-1}$	-0.968	-0.943	-0.825	-0.647
	(-0.41)	(-0.37)	(-0.92)	(-0.66)
Ret $_{t-1}$	0.075	0.087	-0.003	0.026
	(0.23)	(0.25)	(-0.02)	(0.19)
NCSKEW$_{t-1}$	-0.012	-0.017	-0.002	-0.004
	(-0.81)	(-1.04)	(-0.35)	(-0.56)
Ln(Sales) $_{t-1}$	0.002	0.008	0.004	0.005
	(0.16)	(0.64)	(0.82)	(1.11)
ROA $_{t-1}$	0.738***	0.571**	0.266***	0.179**
	(3.57)	(2.49)	(3.36)	(2.06)
Mkt. Leverage $_{t-1}$	-0.174	-0.246*	-0.090*	-0.122**
	(-1.55)	(-1.95)	(-1.96)	(-2.33)
CEO chair $_{t-1}$	-0.037	-0.061*	-0.012	-0.020
	(-1.20)	(-1.75)	(-1.00)	(-1.53)
%Independent directors $_{t-1}$	0.051	0.059	0.027	0.022
	(0.41)	(0.45)	(0.60)	(0.47)
Observations	7,217	5,886	7,217	5,886
R-squared	0.04	0.04	0.05	0.05
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

5.4.2. Robustness checks

In this section, we implement a series of robustness checks to enhance the reliability of our baseline findings by changing our baseline specification. In the first robustness test, we re-examine the relationship between CSR contracting and stock price crash risk by using an alternative measure of crash risk. As discussed in Section 5.3.2.2, we construct an alternative variable, *Crash,* which aims to count the number of weeks in a fiscal year having large negative stock returns. Following Kim et al. (2011a, 2011b), we set *Crash* equals one if a firm in a fiscal year experiences one or more weeks having weekly returns $W_{i,t}$ that are 3.2 standard deviations below the mean of $W_{i,t}$, which represents a frequency of 0.07% in the standard normal

distribution, and zero otherwise. In this sense, *Crash* captures the likelihood of large share price declines in a fiscal year. Then, we examine the impact of CSR contracting measures on *Crash* by estimating the following logistic regression.

$$\log \frac{\pi_{Crash}}{1-\pi_{Crash}} = \beta \times CSR\ contracting_{i,t-1} + \gamma X_{i,t-1} + Industry_i + Year_t + \epsilon_{i,t} \quad (2)$$

where π_{Crash} is the probability that one or more weeks have stock returns that are 3.2 standard deviations below the mean of a fiscal year's weekly returns. The main regressors are *CSR contracting* and *% CSR contracting*. X is a set of control variables included in the baseline regressions. $Industry_i$ and $Year_i$ are fixed effects, as discussed in Section 3.3. ϵ is the error term.

Panel A of Table 5.3 reports the estimation results of equation (2) using logistic regression. We find that the coefficients of *CSR contracting* and *% CSR contracting* are negative and significant at the 5% level, suggesting that the observed moderating effect of CSR contracting on crash risk is not likely to be influenced by our choice of crash risk measures. More importantly, the effect of CSR contracting on the likelihood of a stock price crash is statistically substantial. The coefficient of *CSR contracting* is -0.163, suggesting that the introduction of CSR contracting reduces the probability of a crash by 3.21%, all else being equal. This reduction represents 16.71% of the annual mean crash frequency. Similarly, the coefficient of *% CSR contracting* is -6.968. This result suggests that one standard deviation increase (1.4%) in the share of CSR-based compensation in total CEO compensation is associated with a 2.03% drop in the probability of crash, all else being equal. This reduction represents 10.6% of the annual mean crash frequency.

Next, we check the reliability of the baseline findings by controlling for additional factors that could potentially affect managerial disclosure of bad news. Specifically, we control for the sensitivity of the value of CEO's stock and option holdings to a firm's stock price. The rationale behind this test is that the provisions of stock and option compensation could potentially affect earnings manipulation, thus supporting the accumulation of bad news. Burns and Kedia (2006) argue that the convexity of the pay-for-performance relation introduced by option compensation allows CEOs to benefit substantially from stock price increases, while the loss to CEO wealth when stock price decreases is limited. This feature of option compensation induces CEOs to adopt

an aggressive accounting policy that increases the likelihood of the restatement of financial reports. Supporting this view, Bergstresser and Philippon (2006) find that the strong correlation between CEO compensation and the value of stock and option holdings may motivate managerial use of discretionary accruals to manipulate short-term reported earnings. Following Kim et al. (2016) and Bergstresser and Philippon (2006), we construct two following measures capturing the link between CEO compensation and the value of stock and option holdings. *Stock incentives* is calculated as one percent of a firm's fiscal year-end stock price multiplied by a CEO's stock holdings, scaled by the sum of this product, CEO's bonus, and salary. *Option incentives* is calculated as one percent of a firm's fiscal year-end stock price multiplied by a CEO's option holdings, scaled by the sum of this product, CEO's bonus, and salary.[61]

We re-estimate equation (1) and additionally control for *Stock incentives* and *Option incentives*. Panel B of Table 5.3 reports the regression results. The dependent variables of this analysis are *NCSKEW* and *DUVOL*. Compared to the baseline findings, we find that the coefficients of *CSR contracting* and *% CSR contracting* remain largely unchanged. These findings, thus, strengthen our argument that CSR contracting reduces stock price crash risk.

In the last analysis of this section, consistent with previous chapters of the thesis, we implement a falsification test to alleviate the concern that there may be unobserved factors that affect the level of crash risk while coinciding with the adoption of CSR contracting provisions. If this possibility takes place, the negative relationship between CSR contracting and crash risk would remain unchanged even when we randomly assign the false values of CSR contracting measures for each observation in our sample. To implement this test, we construct two pseudo measures of CSR contracting that correspond to *CSR contracting* and *% CSR contracting*. Then, we examine whether these pseudo CSR contracting measures can explain crash risk, measured by *NCSKEW* and *DUVOL*. The first pseudo variable, *Pseudo CSR contracting*, is constructed by randomly assigning 1961 firm-year observations (which may originally adopt, or not adopt, CSR contracting) with CSR contracting values equal to 1, while the remaining observations are

[61] An implicit assumption of this calculation is that the CEO option's delta equals one. This assumption implies that a one-dollar change in the stock price would result in a one-dollar change in the value of the option.

assigned CSR contracting values of 0. The second variable, *Pseudo % CSR contracting*, is constructed by reallocating the initial *% CSR contracting* values between observations of a group having CSR contracting. Let us consider a simple example of the construction of pseudo variables. Both firm A and firm B adopt CSR contracting, while firms C and D do not adopt CSR contracting. Initially, Firm A has a *% CSR contracting* value of 10%, and Firm B has a *% CSR contracting* value of 1%. After the reallocation, Firm A would have a *Pseudo % CSR contracting* value of 1%, while Firm B would have a *Pseudo % CSR contracting* value of 10%. Observations belonging to the group without CSR contracting (originally) are assigned a *Pseudo % CSR contracting* value of 0. For *Pseudo CSR contracting* (a binary variable), after randomly assigning the values of *CSR contracting*, firm A and firm C would have *Pseudo CSR contracting* equals one, while firm B and firm D would have *Pseudo CSR contracting* equals zero. All missing values are excluded from this analysis.

Panel C of Table 5.3 presents the results of the falsification test. We find that none of the coefficients of pseudo CSR contracting variables is negative and significant. These results lend support to the notion that our baseline findings are not affected by unobserved differences between firms with and without CSR contracting. More importantly, the findings highlight the significance of not only the presence of CSR contracting provisions in CEO contracts, but also the substantiveness of this compensation design in reducing bad news hoarding and stock price crash risk.

Table 5.3. Robustness checks

This table reports the results of three robustness checks of the relationship between CSR contracting and crash risk, including an alternative measure of crash risk, controlling for additional compensation variables, and the falsification test. The same control variables and fixed effects as in the baseline regression (Table 5.2) are included. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the Appendix.

Panel A. An alternative measure of crash risk

	Dependent: Crash	
Variables	(1)	(2)
CSR contracting$_{t-1}$	-0.163**	
	(-2.012)	
% CSR contracting$_{t-1}$		-6.968**
		(-2.104)
Dturn$_{t-1}$	0.103	0.169
	(0.853)	(1.291)
Sigma $_{t-1}$	4.290	7.442
	(0.696)	(1.113)
Ret $_{t-1}$	1.144	1.619
	(1.096)	(1.440)
Ln(Sales) $_{t-1}$	-0.074**	-0.062*
	(-2.379)	(-1.749)
ROA $_{t-1}$	0.751	0.444
	(1.590)	(0.874)
Mkt. Leverage $_{t-1}$	-0.184	-0.133
	(-0.546)	(-0.357)
CEO chair $_{t-1}$	-0.030	-0.025
	(-0.427)	(-0.323)
Board independence $_{t-1}$	0.191	0.092
	(0.653)	(0.292)
Observations	7,205	5,882
Pseudo R-squared	0.0329	0.0368
Industry FE	Yes	Yes
Year FE	Yes	Yes

Panel B. Controlling for option and stock incentives

	NCSKEW		DUVOL	
Variables	(1)	(2)	(3)	(4)
CSR contracting$_{t-1}$	-0.077**		-0.032**	
	(-2.531)		(-2.565)	
% CSR contracting$_{t-1}$		-1.328		-0.684*
		(-1.494)		(-1.690)
Dturn$_{t-1}$	-0.094**	-0.087	-0.064***	-0.059***
	(-2.000)	(-1.647)	(-3.195)	(-2.586)
Sigma $_{t-1}$	1.709	0.492	-0.117	-0.404
	(0.651)	(0.168)	(-0.113)	(-0.352)

(continues)

(continued)

	NCSKEW		DUVOL	
Variables	(1)	(2)	(3)	(4)
Ret $_{t-1}$	0.438	0.280	0.044	0.011
	(1.065)	(0.613)	(0.258)	(0.060)
Ln(Sales) $_{t-1}$	-0.002	0.008	0.002	0.006
	(-0.179)	(0.550)	(0.446)	(1.103)
ROA $_{t-1}$	0.334	-0.048	0.145	-0.027
	(1.438)	(-0.183)	(1.591)	(-0.258)
Mkt. Leverage $_{t-1}$	-0.300**	-0.413***	-0.166***	-0.220***
	(-2.368)	(-2.862)	(-3.182)	(-3.600)
CEO chair $_{t-1}$	-0.000	-0.032	0.005	-0.006
	(-0.009)	(-0.943)	(0.400)	(-0.453)
Board independence $_{t-1}$	0.103	0.131	0.056	0.051
	(0.663)	(0.824)	(0.925)	(0.822)
Option incentives$_{t-1}$	-0.063	-0.087	-0.027	-0.036
	(-0.790)	(-0.927)	(-0.828)	(-0.941)
Stock incentives$_{t-1}$	-0.083	-0.040	-0.049**	-0.031
	(-1.415)	(-0.589)	(-2.096)	(-1.123)
Observations	5,080	3,975	5,080	3,975
R-squared	0.044	0.044	0.066	0.066
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Panel C. Falsification test

	NCSKEW		DUVOL	
Variables	(1)	(2)	(3)	(4)
Pseudo CSR contracting$_{t-1}$	-0.010		-0.004	
	(-0.38)		(-0.33)	
Pseudo % CSR contracting$_{t-1}$		-1.114		-0.307
		(-1.27)		(-0.78)
Dturn$_{t-1}$	-0.007	0.016	-0.019	-0.004
	(-0.16)	(0.35)	(-1.10)	(-0.21)
Sigma $_{t-1}$	-1.623	-1.988	-0.914	-0.859
	(-0.76)	(-0.84)	(-1.10)	(-0.94)
Ret $_{t-1}$	0.022	-0.001	-0.009	0.010
	(0.07)	(-0.00)	(-0.07)	(0.07)
Ln(Sales) $_{t-1}$	-0.003	0.004	0.002	0.004
	(-0.25)	(0.34)	(0.49)	(0.81)
ROA $_{t-1}$	0.721***	0.526**	0.265***	0.169**
	(3.59)	(2.37)	(3.42)	(1.99)

(continues)

(continued)

	NCSKEW		DUVOL	
Variables	(1)	(2)	(3)	(4)
Mkt. Leverage $_{t-1}$	-0.174	-0.250**	-0.091*	-0.124**
	(-1.55)	(-1.99)	(-1.96)	(-2.36)
CEO chair $_{t-1}$	-0.036	-0.059*	-0.011	-0.019
	(-1.14)	(-1.71)	(-0.94)	(-1.45)
Board independence $_{t-1}$	0.039	0.058	0.024	0.022
	(0.31)	(0.45)	(0.53)	(0.47)
Observations	7,217	5,886	7,217	5,886
R-squared	0.04	0.04	0.05	0.05
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

5.4.3. Cross-sectional heterogeneity

In this section, we examine whether the moderating effect of CSR contracting on crash risk is the same for all firms and in all circumstances. The rationale behind these tests is that if CSR contracting curbs managerial bad news hoarding by incentivising them not to cut stakeholder-oriented investments, this effect should be stronger in circumstances where the presence of CSR contracting is more valuable to protect stakeholders' interests. Such circumstances encompass various factors, such as firms' reliance on stakeholders' implicit claims, the volatility of firms' earnings, and the level of religiosity of local areas where firms reside. In this vein, if we find evidence that the crash risk-reduction effect of CSR contracting is heterogeneous in the cross-section, this evidence will strengthen our argument that CEOs with CSR-based compensation commit themselves to maintaining stakeholder-oriented investments that discourage real earnings management and bad news hoarding. Further, these tests help us to alleviate concerns regarding omitted variables, since it is difficult for these omitted variables to cause biases in all regressions. In general, establishing heterogeneous effects of CSR contracting in the cross-section will support our main hypothesis and strengthen the baseline results.

5.4.3.1. Stakeholders' implicit claims

We argue that the dependency of firms on various stakeholders (e.g., employees, customers, suppliers) would amplify the adverse relationship between CSR contracting and crash risk. This conjecture stems from the fact that much of stakeholders' claims against firms remain implicit and are not legally enforced. On the one hand, firms may choose to build the reputation of being socially responsible and meet the expectations of various stakeholders. The resultant higher reputation of fulfilling implicit commitments would generate favourable terms of trade in transactions with stakeholders that result in improvements in future cash flow and lower cost of capital (Bowen et al., 1995). Chakravarthy et al. (2014) define this benefit as reputational capital and posit that higher stakeholders' trust in firms would lead to higher reputational capital, since stakeholders require a lower risk premium to transact with firms. On the other hand, meeting stakeholders' demands consumes much of firms' human and financial resources, while cutting CSR-related spending may save firms resources for other short-term, profitable investments (e.g., Cohn and Wardlaw, 2016; Liu et al., 2021). In this vein, firms may renege on their promises if the present value of firms' gains from reputational capital is marginal and negligible, compared to the costs of meeting implicit commitments. Vice versa, if outcomes of reneging on stakeholders' claims are adversely significant and value-destroying, honouring implicit commitments becomes self-enforced (Bowen et al., 1995).

For firms that heavily rely on long-term relationships with stakeholders (e.g., firms with a specialised workforce and produce unique products), sacrificing implicit claims for a one-off gain is not a wise decision. Indeed, the tightened bonds between firms and stakeholders may amplify the adverse effects of stakeholders' reactions on firm sales and operations if firms renege on implicit commitments. For example, firms making large relationship-specific investments (e.g., purchasing unique physical equipment) to supply major customers would avoid behaving irresponsibly, since any adverse reactions of customers would threaten the continuation of long-term relationships and lead to large losses. In this case, the self-enforcing effect should be stronger, and these firms would optimally incentivise CEOs to improve CSR performance. From the perspective of firms, higher dependency on stakeholders' claims may induce the integration of more intensive CSR contracting in CEOs' compensation contracts to protect stakeholders'

interests and firms' reputations. From the perspective of CEOs, using different techniques to manipulate earnings and conceal bad news may increase the likelihood of restatement in the future, which damages firms' reputation and result in CEO dismissals as a part of the reputation repair and potential civil and criminal liabilities (Karpoff et al., 2008; Chakravarthy et al., 2014). It follows that the presence of CSR contracting is more valuable for firms with large implicit claims.

In this analysis, we focus on the implicit claims of the two most important stakeholders, including employees and customers. To proxy for employees' claims, we follow Chakravarthy et al. (2014) and use *Sales per Employee*, which is the ratio of firm sales to the number of employees. We argue that firms with higher *Sales per employee* are more likely to have a more skilled workforce that is more difficult and expensive to replace (i.e., higher implicit claims against firms). To proxy for customers' claims, we follow Titman and Wessels (1988) and Bowen et al. (1995) to construct *R&D intensity*, calculated as the ratio of R&D expenses to total book assets. Titman and Wessels (1988) argue that R&D-extensive products are more unique and require more ongoing, long-term maintenance and servicing than other products. Customers that purchase more unique products, thus, rely more on ongoing relationships with firms and have higher implicit claims. We conjecture that the negative relationship between CSR contracting and crash risk is stronger for firms having higher *Sales per employee* and *R&D intensity*, where firms have stronger incentives to adopt CSR contracting.

To test this conjecture, we repeat the baseline regression by including an interaction term between CSR contracting measures and proxies for stakeholders' implicit claims (i.e., *Sales per employee* and *R&D intensity*) and the proxies themselves. If the higher reliance of firms on the relationships with stakeholders leads to a more prominent effect of CSR contracting on crash risk, the coefficients of the interaction terms should be negative and significant. The results reported in Table 5.4 are largely consistent with our conjecture that the effect of CSR contracting on crash risk varies with the level of implicit claims. Specifically, we report in Panel A of Table 5.4 that the coefficients of the interaction terms between CSR contracting measures and *Sales per employee* are negatively significant at the 1% level. The regression results suggest that CSR

contracting has a stronger adverse effect on *NCSKEW* and *DUVOL* if *Sales per employee* is higher. This finding is consistent with the notion that CSR contracting is more effective in curbing bad news hoarding when firms have a more specialised workforce.

Following the same strategy, we further examine the impact of customers' claims on the link between CSR contracting and crash risk. As reported in Panel B of Table 5.4, the interaction terms between CSR contracting measures and the proxy for customers' implicit claims (i.e., *R&D intensity*) are largely negative and significant when we use *NCSKEW* and *DUVOL* to measure crash risk. This finding suggests that the effect of CSR contracting on crash risk is more effective if firms have greater reliance on customers' claims. Overall, the evidence provided in this section lends support to our argument that the extent to which firms rely on long-term relationships with stakeholders is one dimension that influences the strength of the link between CSR contracting and crash risk. If the continuation of ongoing relationships with stakeholders is more crucial for firm performance, firms are more likely to adopt CSR contracting more substantially to protect stakeholders' claims, thereby further reducing managerial bad news hoarding.

Table 5.4. The impact of CSR contracting on crash risk, conditional on stakeholders' implicit claims

This table examines the impact of the level of stakeholders' implicit claims on the relationship between CSR contracting and crash risk. The dependent variables are *negative skewness (NCSKEW)* and *down-to-up volatility (DUVOL)*, as specified in Section 5.3.2.2. The main explanatory variables are *CSR contracting* and *% CSR contracting*. *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. Panel A examines the effect of CSR contracting on crash risk, conditional on *Sales per Employee. Sales per Employee* is the ratio of firm sales to the number of employees. Panel B examines the effect of CSR contracting on crash risk, conditional on research and development (R&D) expenditures, measured as the ratio of R&D spending to total assets. The same control variables and fixed effects as in the baseline regression (Table 5.2) are included. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the Appendix.

Panel A. The influence of employees' claims on the effect of CSR contracting

	NCSKEW		DUVOL	
Variables	(1)	(2)	(3)	(4)
CSR contracting$_{t-1}$	0.010		0.007	
	(0.265)		(0.469)	
% CSR contracting$_{t-1}$		-0.553		-0.154

(continues)

(continued)

	NCSKEW		DUVOL	
Variables	(1)	(2)	(3)	(4)
		(-0.430)		(-0.276)
Sales per Employee $_{t-1}$	0.000***	0.000***	0.000***	0.000***
	(3.670)	(3.225)	(3.374)	(2.701)
CSR contracting $_{t-1}$ x Sales per employee $_{t-1}$	-0.000***		-0.000***	
	(-2.914)		(-3.179)	
% CSR contracting $_{t-1}$ x Sales per employee $_{t-1}$		-0.002**		-0.001***
		(-2.206)		(-2.674)
Dturn$_{t-1}$	-0.002	0.020	-0.017	-0.003
	(-0.046)	(0.438)	(-1.018)	(-0.178)
Sigma $_{t-1}$	-1.972	-2.323	-1.058	-0.997
	(-0.930)	(-0.994)	(-1.291)	(-1.108)
Ret $_{t-1}$	-0.020	-0.044	-0.029	-0.011
	(-0.065)	(-0.130)	(-0.232)	(-0.082)
Ln(Sales) $_{t-1}$	-0.004	0.000	0.002	0.004
	(-0.374)	(0.038)	(0.440)	(0.716)
ROA $_{t-1}$	0.703***	0.512**	0.260***	0.165*
	(3.533)	(2.319)	(3.380)	(1.955)
Mkt. Leverage $_{t-1}$	-0.191*	-0.253**	-0.096**	-0.124**
	(-1.719)	(-2.038)	(-2.101)	(-2.383)
CEO chair $_{t-1}$	-0.035	-0.056	-0.011	-0.018
	(-1.140)	(-1.627)	(-0.940)	(-1.403)
Board independence $_{t-1}$	0.058	0.068	0.031	0.026
	(0.461)	(0.520)	(0.671)	(0.538)
Observations	7,190	5,862	7,190	5,862
R-squared	0.039	0.041	0.053	0.053
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Panel B. The influence of customers' claims on the effect of CSR contracting

	NCSKEW		DUVOL	
Variables	(1)	(2)	(3)	(4)
CSR contracting$_{t-1}$	-0.026		-0.011	
	(-0.818)		(-0.844)	
% CSR contracting$_{t-1}$		-1.734**		-0.758*
		(-1.965)		(-1.959)
R&D intensity $_{t-1}$	-0.602	-0.744	-0.254	-0.307
	(-1.178)	(-1.361)	(-1.270)	(-1.431)
CSR contracting $_{t-1}$ x R&D intensity $_{t-1}$	-1.660**		-0.492*	

(continues)

(continued)

	NCSKEW		DUVOL	
Variables	(1)	(2)	(3)	(4)
	(-2.580)		(-1.738)	
% CSR contracting $_{t-1}$ x R&D intensity $_{t-1}$		-55.910*		-22.380
		(-1.758)		(-1.414)
Dturn$_{t-1}$	-0.007	0.012	-0.019	-0.006
	(-0.176)	(0.260)	(-1.126)	(-0.312)
Sigma $_{t-1}$	-1.586	-1.836	-0.887	-0.799
	(-0.751)	(-0.782)	(-1.075)	(-0.880)
Ret $_{t-1}$	0.030	0.009	-0.005	0.013
	(0.096)	(0.027)	(-0.041)	(0.099)
Ln(Sales) $_{t-1}$	-0.001	0.005	0.003	0.005
	(-0.101)	(0.431)	(0.616)	(0.943)
ROA $_{t-1}$	0.717***	0.519**	0.263***	0.166**
	(3.628)	(2.380)	(3.446)	(1.993)
Mkt. Leverage $_{t-1}$	-0.208*	-0.286**	-0.104**	-0.139***
	(-1.842)	(-2.274)	(-2.226)	(-2.625)
CEO chair $_{t-1}$	-0.040	-0.063*	-0.013	-0.020
	(-1.299)	(-1.813)	(-1.089)	(-1.588)
Board independence $_{t-1}$	0.060	0.071	0.032	0.028
	(0.485)	(0.541)	(0.703)	(0.580)
Observations	7,217	5,886	7,217	5,886
R-squared	0.039	0.041	0.052	0.053
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

5.4.3.2. Earnings volatility

Besides the level of firms' implicit commitments to stakeholders, the cross-sectional heterogeneity in the effect of CSR contracting on crash risk may also be due to firm performance factors that incentivise stronger real earnings management. One potential factor is the stability of earnings paths. In a survey study, Graham et al. (2005) explain a managerial preference for achieving smooth reported earnings. First, bumpy reported earnings deteriorate investors' ability to estimate future earnings and firm value, thus amplifying estimation risk (Dichev and Tang, 2009). It follows that investors would perceive firms having volatile earnings as riskier, thus adversely affecting firm value (Khurana et al., 2018). Simultaneously, highly volatile earnings patterns would undermine analysts' trust in accounting numbers and increase analysts'

disagreement about firms' prospects. As a result, both higher estimation risk and more sceptical views of analysts would lead to a higher risk premium required, lower stock price, and higher costs of capital (Rountree et al., 2008). Smoothing earnings, either using accrual discretionary or real activities, may support CEOs in maintaining optimistic firms' financial images. For example, managers may smooth earnings via earnings management to receive favourable credit ratings that reduce the costs of debts and equity (Jung et al., 2013; Khurana et al., 2018).

Second, important stakeholders, such as corporate customers and suppliers, may perceive volatile earnings as signals of financial problems that deteriorate firms' ability to maintain sustainable business relationships. Thus, stakeholders may take actions that negatively affect the terms of trade in transactions with firms (Graham et al., 2005). For instance, suppliers might view volatile earnings as an early indicator of firms' potential inability to settle their payments timely. Overall, smoothing earnings is a value-enhancing activity if firms' earnings volatility is high, and managers have a stronger incentive to manipulate CSR investments to smooth bumpy earnings. This argument aligns with Khurana et al. (2018), who find that earnings smoothing via real activities can support managerial earnings inflation and affect crash risk. Similarly, we argue that when earnings volatility is high, which induces stronger earnings smoothing activities, the presence of CSR contracting should have a stronger moderating effect on managerial earnings manipulation via sacrificing CSR spending.

One may argue that given a level of earnings volatility, CEOs may choose accrual-based earnings smoothing devices, which is unlikely to be associated with the effect of CSR contracting on real earnings management. We justify this analysis by positing that although CEOs have numerous options to smooth earnings, smoothing earnings by sacrificing CSR investments is difficult to be challenged by investors, analysts, and regulators (Graham et al., 2005; Roychowdhury, 2006).[62] In addition, Khurana et al. (2018) emphasise the importance of real earnings smoothing, since lower-level managers do not have the authority to choose accounting methods for smoothing, while real earnings smoothing is easier to implement and more likely to be undertaken. Overall,

[62] In their survey, Graham et al. (2005) report that 78% of CFOs prefer to forgo economic value to achieve smoother earnings patterns.

we conjecture that the link between CSR contracting and crash risk is strengthened if firms' earnings volatility is higher.

To test this conjecture, we first follow Callen and Fang (2015) to construct the variable *Earnings volatility*. *Earnings volatility* is the standard deviation of net income scaled by total book assets of four quarters within a fiscal year. Then, we repeat the baseline regressions with the inclusion of *Earnings volatility* and the interaction term between *Earnings volatility* and measures of CSR contracting. If CSR contracting is more effective when *Earnings volatility* is high, we expect the interaction term to be negative and significant. We report regression results in Table 5.5. Consistent with our conjecture, the coefficients of the interaction terms are negative and significant across all regressions. We interpret these results that the moderating effect of CSR contracting on crash risk is more pronounced for firms having higher levels of *Earnings volatility*. Overall, the above findings support the idea that CSR contracting becomes more crucial to mitigate crash risk as bumpy performance encourages earnings smoothing and exacerbates bad news accumulation.

Table 5.5. The impact of CSR contracting on crash risk, conditional on earnings volatility

This table examines the effect of CSR contracting on crash risk, conditional on earnings volatility. The dependent variables are *negative skewness (NCSKEW)* and *down-to-up volatility (DUVOL)*, as specified in Section 5.3.2.2. The main explanatory variables are *CSR contracting* and *% CSR contracting*. *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. *Earnings volatility* is the standard deviation of net income, scaled by total assets of four quarters within a fiscal year. The same control variables and fixed effects as in the baseline regression (Table 5.2) are included. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the Appendix.

	NCSKEW		DUVOL	
Variables	(1)	(2)	(3)	(4)
CSR contracting$_{t-1}$	-0.032		-0.011	
	(-1.069)		(-0.932)	
% CSR contracting$_{t-1}$		-1.164		-0.459
		(-1.260)		(-1.067)
Earnings volatility $_{t-1}$	1.258**	1.189**	0.330	0.282
	(2.285)	(2.226)	(1.437)	(1.273)
CSR contracting $_{t-1}$ x Earnings volatility $_{t-1}$	-1.671**		-0.569*	

(continues)

(continued)

	NCSKEW		DUVOL	
Variables	(1)	(2)	(3)	(4)
	(-2.407)		(-1.847)	
%CSR contracting $_{t-1}$ x Earnings volatility $_{t-1}$		-89.280*		-44.209*
		(-1.876)		(-1.738)
Dturn$_{t-1}$	-0.005	0.016	-0.017	-0.003
	(-0.128)	(0.343)	(-1.014)	(-0.166)
Sigma $_{t-1}$	-1.953	-2.166	-1.061	-0.941
	(-0.912)	(-0.908)	(-1.277)	(-1.028)
Ret $_{t-1}$	-0.004	-0.009	-0.028	-0.004
	(-0.012)	(-0.026)	(-0.221)	(-0.028)
Ln(Sales) $_{t-1}$	0.003	0.009	0.004	0.006
	(0.224)	(0.687)	(0.869)	(1.156)
ROA $_{t-1}$	0.680***	0.495**	0.252***	0.159*
	(3.392)	(2.227)	(3.256)	(1.870)
Mkt. Leverage $_{t-1}$	-0.148	-0.223*	-0.082*	-0.116**
	(-1.327)	(-1.796)	(-1.793)	(-2.239)
CEO chair $_{t-1}$	-0.035	-0.058*	-0.011	-0.019
	(-1.122)	(-1.672)	(-0.937)	(-1.460)
Board independence $_{t-1}$	0.028	0.041	0.019	0.016
	(0.228)	(0.316)	(0.429)	(0.332)
Observations	7,160	5,842	7,160	5,842
R-squared	0.038	0.040	0.051	0.052
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

5.4.3.3. Religiosity

Religion is another factor that may cause heterogeneity in the effect of CSR contracting. Hilary and Hui (2009) find that stakeholders in US counties having high religious adherents tend to be more risk averse. In this vein, corporate initiatives to safeguard the claims of risk-averse stakeholders should become more important and valuable. In turn, if firms' viability is questionable, we expect these stakeholders to react more strongly to protect their claims. In this case, stakeholders' reactions may seriously damage firms' sales and operations, thus imposing higher pressure on firms to honour promises. The outcome of this process is that firms may have strong incentives to provide more effective and more substantial CSR contracting provisions to constrain managerial discretion on CSR spending. In this vein, CSR contracting should have a

stronger adverse effect on the level of crash risk. Overall, we conjecture that the religiosity of US counties in which firms incorporate may strengthen the link between CSR contracting and crash risk.

To test this conjecture, following Hilary and Hui (2009), we construct a variable *Religious adherents* to proxy for the religiosity of a specific US county. Accordingly, *Religious adherents* is the number of religious adherents living in a US county, divided by the county's total population. We obtain data from the American Association of Religion Data Archives (ARDA) database, which provides detailed information about religious adherents and churches at the county level every ten years.[63] The database covers a period from 1980 to 2010. We then repeat the baseline regressions where we regress measures of crash risk (i.e., *NCSKEW* and *DUVOL*) on CSR contracting measures, *Religious adherents*, and the interaction terms between CSR contracting measures and *Religious adherents*. If religiosity amplifies the effect of CSR contracting on crash risk, we expect the interaction terms to be negative and significant.

Table 5.6 reports the regression results of this analysis. Accordingly, the interaction terms are negative and significant at the 5% level in Columns 2 to 4, thus lending support to our conjecture. Nevertheless, when the dependent variable is *NCSKEW* (Column 1), the interaction term is insignificant, possibly due to the lack of variation in the binary *CSR contracting* variable. These results suggest that the adverse effect of CSR contracting on crash risk is more pronounced for firms incorporated in US counties with higher levels of religiosity. Collectively, the above evidence is in line with the notion that due to the impact of religion on stakeholders' risk preferences, firms provide more substantial CSR contracting provisions to protect stakeholders' claims from managerial manipulation, thus making this provision more effective in reducing crash risk.

Table 5.6. The impact of CSR contracting on crash risk, conditional on religious adherence

This table examines the effect of CSR contracting on crash risk, conditional on religious adherents. The dependent variables are *negative skewness (NCSKEW)* and *down-to-up volatility (DUVOL)*, as specified in Section 5.3.2.2. The

[63] The religious adherents data is available at https://www.thearda.com/data-archive/browse-categories?cid=B#B

main explanatory variables are *CSR contracting* and *% CSR contracting*. *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. *Religious adherents* is the number of religious adherents living in a US county, scaled by the total population of this county. The same set of control variables and fixed effects, as in the baseline regression (Table 5.2), are included. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the Appendix.

	NCSKEW		DUVOL	
Variables	(1)	(2)	(3)	(4)
CSR contracting$_{t-1}$	-0.016		0.003	
	(-0.427)		(0.174)	
% CSR contracting$_{t-1}$		-0.355		0.011
		(-0.380)		(0.026)
Religious adherence $_{t-1}$	0.022	0.021	0.010	0.009
	(0.754)	(0.746)	(0.870)	(0.786)
CSR contracting $_{t-1}$ x Religious adherents $_{t-1}$	-0.078		-0.043**	
	(-1.503)		(-2.093)	
% CSR contracting $_{t-1}$ x Religious adherents $_{t-1}$		-3.593**		-1.841***
		(-2.549)		(-2.987)
Dturn$_{t-1}$	-0.000	0.029	-0.015	0.003
	(-0.004)	(0.614)	(-0.845)	(0.145)
Sigma $_{t-1}$	-2.159	-2.502	-1.164	-1.121
	(-1.008)	(-1.049)	(-1.401)	(-1.223)
Ret $_{t-1}$	-0.041	-0.062	-0.042	-0.026
	(-0.128)	(-0.178)	(-0.332)	(-0.191)
Ln(Sales) $_{t-1}$	0.002	0.008	0.004	0.006
	(0.192)	(0.659)	(0.847)	(1.142)
ROA $_{t-1}$	0.721***	0.555**	0.269***	0.184**
	(3.557)	(2.460)	(3.450)	(2.151)
Mkt. Leverage $_{t-1}$	-0.168	-0.240*	-0.087*	-0.117**
	(-1.454)	(-1.875)	(-1.835)	(-2.204)
CEO chair $_{t-1}$	-0.039	-0.066*	-0.012	-0.021*
	(-1.242)	(-1.866)	(-1.016)	(-1.653)
Board independence $_{t-1}$	0.019	0.027	0.017	0.010
	(0.153)	(0.201)	(0.359)	(0.215)
Observations	7,044	5,760	7,044	5,760
R-squared	0.039	0.042	0.053	0.054
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

5.5. Addressing endogeneity concerns

One concern that prevents us from concluding a causal relationship between CSR contracting and crash risk is the endogeneity of CSR contracting. Although we control for different time-varying firm characteristics and fixed effects, our baseline results are still susceptible to possible impacts of omitted variables that correlate with CSR contracting and firm-specific crash risk. In this case, any conclusions about the causal relationship would be spurious. Therefore, we perform additional robustness checks to alleviate the endogeneity concern and increase the reliability of our results. Similar to Chapter 4, we first provide supporting evidence from the propensity score matching analysis and difference-in-differences analysis. Then, we examine the exogenous effect of CSR contracting on crash risk using the two-stage least square regression, and lastly, perform a check for reverse causality.

5.5.1. Propensity score matching analysis

In the first attempt to alleviate endogeneity concerns, we exploit the propensity score matching analysis. This analysis aims to derive two sub-samples of firms with CSR contracting (i.e., treated firms) and without CSR contracting (i.e., control firms) that are indistinguishable from each other. To derive these samples, firms in the treatment group are matched with firms in the control group using a set of observable firm characteristics used in the baseline specification. After matching, these firms become indifferent, resulting in the higher likelihood that any difference in firm outcomes (i.e., crash risk) is due to the presence of CSR-based compensation but not due to other factors.

To implement this analysis, we start by estimating the probability (i.e., the propensity score) that a firm would adopt CSR contracting. In this analysis, we estimate the propensity score of CSR contracting adoption by using logistic regression and controlling for all explanatory variables and fixed effects included in the baseline specification. Panel A of Table 5.7 reports the pre-match regression result in Column 1. Consistent with Waddock and Graves (1997), we find that larger firms (measured by *Ln(Sales)*) receive more public pressure to behave responsibly, and thus, they are more likely to adopt CSR contracting. Consistent with Hong et al. (2016), we find that firms

with CEO duality and less board independence are less likely to adopt CSR contracting. Then, the propensity scores of firms' adoption of CSR contracting are estimated from the regression result reported in Column 1 of Panel A.

In the next step, we use the nearest neighbour matching algorithm to match firms in the treatment group with those in the control group without replacement.[64] Specifically, an observation in the treatment group is matched with an observation in the control group with the nearest propensity score to the former. Because we implement the one-on-one matching, we only retain a pair of firm-year observations with the smallest difference in propensity scores if one observation in the control group is matched with more than one observation in the treatment group. In addition, we require that the maximum difference between propensity scores (i.e., the caliper) of paired observations is 0.01 to ensure the matching quality.[65] Besides, we implement an additional diagnostic test reported in Column 2 of Panel A. Contrary to the results of the pre-match logistic regression, none of the control variables can explain the probability of adopting CSR contracting in the post-match regression. This evidence suggests that matched firms have no distinguishable characteristics that can determine crash risk and the adoption of CSR contracting at the same time.

We compare different characteristics of treated firms with those of control firms and report the results in Panel B of Table 5.7. Accordingly, these firms are indistinguishable after the matching procedure, except for the presence of CSR contracting observed in the treatment group. Collectively, these diagnostic tests increase our confidence that any difference in the level of firm risk between treatment and control groups is due to the presence of CSR contracting, not firm characteristics.

Lastly, in Panel C of Table 5.7, we present the propensity score matching estimates. Our analysis reveals that treated firms exhibit a reduced susceptibility to stock price crashes, as measured by *NCSKEW* and *DUVOL*, compared to control firms. Given their indistinguishable characteristics after matching, this decrease in crash risk is likely attributed to the presence of CSR contracting.

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[64] Matching without replacement means that once a control firm (observations) is matched with a treated firm (observations), it is not eligible to be matched with other treated firms (observations).

[65] Our results remain the same if we adjust the caliper to different values, including 0.05, 0.005, 0.001 and 0.0005, to allow for stricter or looser matching.

Specifically, we observe reductions of 0.072 and 0.024 in *NCSKEW* and *DUVOL*, which represent 26.56% and 28.57% of their respective sample means. These findings collectively reinforce our baseline results.

Table 5.7. Propensity score matching estimator

This table reports the results of the propensity score matching approach. Panel A reports the pre-match and post-match propensity score regressions. The dependent variable is CSR contracting. *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. The same set of control variables and fixed effects, as in the baseline regression (Table 5.2), are included. Panel B reports the post-match differences in firm characteristics between samples of firms with and without CSR contracting. Panel C reports the average treatment effect of the treated. The variables of interest are *negative skewness (NCSKEW)* and *down-to-up volatility (DUVOL)*, as specified in Section 5.3.2.2. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the Appendix.

Panel A. Pre-match and post-match (diagnostic) propensity score regression

	Dependent: CSR contracting	
Variables	(1)	(2)
$Dturn_{t-1}$	-0.088	-0.015
	(-0.857)	(-0.123)
$Sigma_{t-1}$	-21.952***	4.115
	(-4.031)	(0.603)
Ret_{t-1}	-2.345**	0.526
	(-2.457)	(0.427)
$Ln(Sales)_{t-1}$	0.345***	0.006
	(12.508)	(0.173)
ROA_{t-1}	-1.002**	0.254
	(-2.056)	(0.429)
Mkt. $Leverage_{t-1}$	0.717***	0.137
	(2.606)	(0.408)
CEO $chair_{t-1}$	-0.525***	-0.003
	(-8.331)	(-0.041)
Board $independence_{t-1}$	2.667***	0. 038
	(9.730)	(0.113)
Observations	7,230	3,344
Pseudo R-squared	0.1537	0.0018
Industry FE	Yes	Yes
Year FE	Yes	Yes

Panel B. Differences in firm characteristics

Variables	Treated mean	Control mean	Difference	t-stat
Dturn	0.048	0.048	0.000	-0.02
Sigma	0.034	0.033	0.000	0.35
Ret	-0.070	-0.070	-0.001	-0.28
Ln(Sales)	9.328	9.323	0.004	0.11
ROA	0.102	0.101	0.001	0.45
Mkt. Leverage	0.177	0.176	0.001	0.2
CEO chair	0.656	0.659	-0.004	-0.22
Board independence	0.815	0.814	0.001	0.21

Panel C. Propensity score matching estimators

Variables	Treated	Controls	Difference	t-stat
NCSKEW	0.242	0.314	-0.072	-2.08**
DUVOL	0.082	0.106	-0.024	-1.72*

5.5.2. Evidence from the difference-in-differences estimates

To further alleviate the endogeneity concerns, we implement the difference-in-differences analysis using the first-time adoption of CSR contracting as the treatment event. We consider the first year of CSR contracting adoption as the treatment event, for two reasons. First, the first-time CSR contracting adoption is highly likely to have the largest impact on executive behaviour and subsequent firm outcomes, compared to the later firm-years with CSR contracting. Second, the effect of the first-time adoption is not confounded by the effects of CSR contracting provisions in the previous years.

To perform this analysis, we first separate the dataset into two groups: (i) the treatment group in which firms adopt CSR contracting; and (ii) the control group in which firms do not adopt CSR contracting. Similar to Section 5.5.1, we require that treated firms are not different from control firms, or in other words, observed firm characteristics (i.e., explanatory variables in the baseline model) of the two groups must be statistically similar to each other. In addition, all firms included in this analysis must have data in five years before (year *t-5*, year *t-4*, year *t-3*, year *t-2*, and year *t-1*) and five years after (year *t+1*, year *t+2*, year *t+3*, year *t+4*, and year *t+5*) the first-time

adoption of CSR contracting (i.e., year *t*). The chosen lengths of pre- and post-treatment periods are long enough to retain sufficient observations for accurate analyses. We also exclude the treatment year to avoid the noise caused by the transition. Overall, any changes in crash risk after the adoption of CSR contracting should be more likely due to the presence of CSR-based compensation rather than observable changes of controlled firm characteristics.

We start by estimating the probability that a firm links the CEO compensation to CSR criteria (i.e., the propensity score). The propensity score is the estimated value from the probit regression where *CSR contracting* is regressed on past firm characteristics as in the baseline model, including industry and year-fixed effects. Then, a firm-year observation in the control group is matched with a treated firm-year observation having the nearest propensity score using the nearest neighbour matching algorithm without replacement.[66] To ensure the best possible matching of observations, we require that the difference in propensity scores of control and treated firms must be smaller or equal to 0.005 (e.g., Chen et al., 2017).[67] In addition, if one control firm-year observation matches with more than one treated firm-year observation, only a pair of observations with the smallest difference in propensity scores is retained.

Panel A of Table 5.8 compares firm characteristics between the treatment and control groups after matching. As can be seen, after the matching process, all firm characteristics are not statistically different from each other. This result demonstrates that we have performed a good matching where there are no observable differences between two groups of firms, except the treatment in year *t*. This result also suggests that any variation in the level of crash risk after the treatment event in year *t* is due to the effect of the first-time adoption, not the pre-existing differences between firms. After matching, we retain 1200 observations, which are equivalent to 60 pairs of firms. We then estimate the following panel regression to identify the effect of the treatment on crash risk.

[66] Matching without replacement means that once a control firm (observations) is matched with a treated firm (observation), it is not eligible to be matched with other treated firms (observations).
[67] Our results remain the same if we adjust the caliper to different values, including 0.05, 0.01, 0.001 and 0.0005, to allow for stricter or looser matching.

$$Crash\ risk_{i,t} = \alpha + \beta_1 Treatment_{i,t} + \beta_2 Post_{i,t} + \beta_3 \times Treatment_{i,t} \times Post_{i,t} + \gamma X_{i,t-1} + Industry_i + Year_t + \epsilon_{i,t} \quad (3)$$

where *Crash risk* includes *NCSKEW* and *DUVOL*. *Treatment* equals one if a firm is in the treatment group, and zero otherwise. As illustrated in Figure 5.1, *Post* equals one if a firm-year is after the treatment, and zero if a firm-year is before the treatment. If CSR contracting has a moderating effect on crash risk after the adoption of this provision, then we should expect the coefficient β_3 is negative. Panel B of Table 5.8 reports regression results where *NCSKEW* (Column 1) and *DUVOL* (Column 2) are dependent variables. As expected, the coefficients β_3 are negative and significant in both regressions at the 1% level. These results lend support to the notion that the first-time adoption of CSR contracting has a negative and considerable impact on the level of crash risk, compared to the pre-treatment period, thus strengthening our baseline results.

Table 5.8. Difference-in-Differences analysis using the first-time adoption as the treatment event

This table reports the results of difference-in-differences analysis using the first-time adoption of CSR contracting as the treatment event. Panel A reports the covariate balance between the treatment and control groups. Panel B reports the results of the difference-in-differences regressions. The dependent variables are *negative skewness (NCSKEW)* and *down-to-up volatility (DUVOL)*, as specified in Section 5.3.2.2. *Treatment* is an indicator that equals one for treatment firms, and zero otherwise. *Post* is an indicator variable that equals one for fiscal years after the first year of CSR contracting adoption, and zero otherwise. The same control variables and fixed effects as in the baseline regression (Table 5.2) are included. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the Appendix.

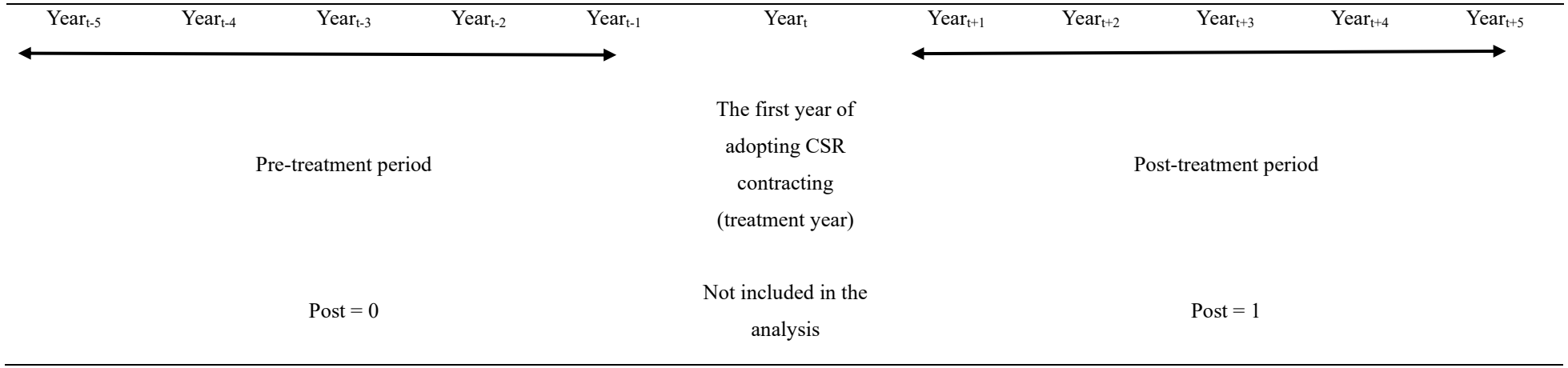
Panel A. Post-match differences in firm characteristics

Variables	Treated mean	Control mean	Difference	t-stat
Dturn	0.058	0.056	0.002	0.11
Sigma	0.038	0.037	0.000	0.36
Ret	-0.090	-0.088	-0.003	-0.37
Ln(Sales)	9.047	8.970	0.077	1.14
ROA	0.110	0.116	-0.005	-1.24
Mkt. Leverage	0.143	0.136	0.007	0.93
CEO chair	0.692	0.699	-0.007	-0.25
Board independence	0.771	0.768	0.003	0.33

Panel B. Difference-in-Differences regressions

	NCSKEW	DUVOL
Variables	(1)	(2)
Treatment	0.028	0.000
	(0.422)	(0.002)
Post	0.199**	0.077**
	(2.543)	(2.482)
Treatment x Post	-0.299***	-0.107**
	(-2.712)	(-2.326)
$Dturn_{t-1}$	0.070	0.019
	(0.760)	(0.492)
$Sigma_{t-1}$	0.500	0.102
	(0.103)	(0.050)
Ret_{t-1}	0.400	0.155
	(0.553)	(0.506)
$Ln(Sales)_{t-1}$	-0.021	-0.008
	(-0.775)	(-0.757)
ROA_{t-1}	1.359***	0.514**
	(2.646)	(2.592)
Mkt. $Leverage_{t-1}$	0.033	0.040
	(0.123)	(0.377)
CEO $chair_{t-1}$	0.002	0.004
	(0.024)	(0.134)
Board $independence_{t-1}$	0.234	0.070
	(0.944)	(0.714)
Observations	1,200	1,200
R-squared	0.076	0.093
Industry FE	Yes	Yes
Year FE	Yes	Yes

Figure 5.1. Observation window in DiD analysis



5.5.3. Evidence from the instrumental variable analysis

Our next identification strategy to address endogeneity concerns is to use the two-stage least squares (2SLS) regression with an instrumental variable. The main purpose of this analysis is to isolate the exogenous component of CSR contracting and link this component to the variation in the level of crash risk. In line with Flammer et al. (2019), we use constituency statutes as an instrument for 2SLS regressions. Constituency statutes are US states' statutes that allow managers to consider the interests of a broader set of stakeholders, such as employees, customers, and community, in their decision-making process, thus balancing the interests of various constituency groups. In this case, CEOs are not considered breaching their fiduciary duties to shareholders. Flammer et al. (2019) posit that constituency statutes pave the way for more responsible corporate decisions, since the barriers that prevent managers and directors from deciding responsibly are removed. In this vein, firms operating in US states that enact constituency statutes should be more likely to adopt CSR contracting and assign more weight to this provision in executive compensation. Thus, constituency statutes are positively associated with the corporate adoption of CSR contracting. Further, the enactment of constituency statutes is unlikely related to corporate strategies, since firms are not involved in the enactment of such statutes. Using constituency statutes as an instrumental variable, thus, allows us to extract the exogenous variation of firms' propensity to adopt CSR contracting and examine how this variation affects the level of crash risk.

Similar to previous chapters, we construct the variable *Constituency statutes* based on the report of enactment years in Karpoff and Wittry (2018). *Constituency statutes* equals one if a firm incorporates in the US state that enacts this statute, and zero otherwise. Although most US states adopted constituency statutes before 2000, two states enacted this legislation within our observation window from 2000 to 2018: Texas in 2006 and Nebraska in 2007. The variation of *Constituency statutes* variable due to these two enactments allows us to estimate 2SLS regression and examine the exogenous impact of CSR contracting on crash risk.

Panel A of Table 5.9 reports 2SLS regression results using *NCSKEW* and *DUVOL* as dependent variables and *CSR contracting* as the main regressor. We first report the results of first-stage

regressions, followed by the second-stage regressions' results. As can be seen in Columns 1 and 3 of Panel A, the coefficients of *Constituency statutes* are positive and significant at the 1% level, suggesting that these statutes increase the likelihood of CSR contracting.[68] Similarly, the regression results reported in Columns 1 and 3 of Panel B (Table 5.9) show that the instrument *Constituency statutes* is significantly and positively associated with *% CSR contracting* at the 1% level. Overall, consistent with Flammer et al. (2019), these results support our conjecture that firms incorporated in US states that enact constituency statutes are more inclined to adopt CSR contracting provisions.

We next examine the relationship between an exogenous component of CSR contracting (i.e., the predicted values of CSR contracting measures in the first-stage regressions) and *NCSKEW* and *DUVOL* in second-stage regressions. Again, we use the same control variables as in the baseline specification. In Columns 2 and 4 of Panel A (Table 5.9), we find that *Instrumented CSR contracting* is adversely associated with *NCSKEW* and *DUVOL* at the 1% and 10% levels, respectively. Meanwhile, as reported in Columns 2 and 4 of Panel B (Table 5.9), *Instrumented % CSR contracting* significantly decreases *NCSKEW* at the 10% significance level but does not moderate *DUVOL*. In addition, the coefficients of instrumented CSR contracting variables are larger than those of CSR contracting measures reported in the baseline results. For example, the presence of CSR contracting (i.e., *CSR contracting* = 1) decreases *NCSKEW* by 0.192 in the 2SLS regression, compared to the decrease of 0.057 of *NCSKEW* in the baseline OLS regression. The signs of control variables also align with those reported in the baseline results. Overall, these findings continue supporting the notion that CSR contracting reduces managerial bad news hoarding and crash risk.

Table 5.9. Instrumental variable analysis

This table reports the results of the instrumental variable analysis using two-stage least square panel regressions. Panel A reports the results of regressions using *CSR contracting* as the main explanatory variable. *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. Panel B reports the results of regressions using *% CSR contracting* as the main explanatory variable. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. Regressions in both Panels A and B use *Constituency*

[68] In the first-stage regressions, we reject the hypothesis that *Constituency statutes* is irrelevant and weak, since the F-statistics are above ten and the Kleibergen-Paap rk Wald F statistics are larger than Stock-Yogo's critical values (Stock and Yogo, 2005).

statute as the instrumental variable. *Constituency statute* is an indicator variable that equals one if a firm is incorporated in a state that enacts a constituency statute, and zero otherwise. The same control variables and fixed effects (firm- and year-fixed effects as in the baseline regression (Table 5.2) are included. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the Appendix.

Panel A. CSR contracting as the main independent variable

	CSR contracting	NCSKEW	CSR contracting	DUVOL
Variables	(1)	(2)	(3)	(4)
Constituency statute$_{t-1}$	0.512***		0.512***	
	(12.36)		(12.36)	
Instrumented CSR contracting$_{t-1}$		-0.192***		-0.093*
		(-2.64)		(-1.93)
Dturn$_{t-1}$	-0.009	0.042	-0.009	-0.002
	(-0.68)	(0.98)	(-0.68)	(-0.11)
Sigma $_{t-1}$	0.257	-11.848***	0.257	-3.979***
	(0.29)	(-4.68)	(0.29)	(-4.00)
Ret $_{t-1}$	0.060	-1.127***	0.060	-0.356**
	(0.43)	(-3.03)	(0.43)	(-2.36)
Ln(Sales) $_{t-1}$	-0.008	0.095**	-0.008	0.041**
	(-0.31)	(2.01)	(-0.31)	(2.30)
ROA $_{t-1}$	-0.121	0.345	-0.121	0.170
	(-0.79)	(1.13)	(-0.79)	(1.42)
Mkt. Leverage $_{t-1}$	-0.053	-0.789***	-0.053	-0.359***
	(-0.43)	(-3.44)	(-0.43)	(-3.73)
CEO chair $_{t-1}$	-0.013	-0.034	-0.013	-0.012
	(-0.74)	(-0.77)	(-0.74)	(-0.71)
Board independence $_{t-1}$	-0.028	0.110	-0.028	0.045
	(-0.31)	(0.57)	(-0.31)	(0.63)
Observations	7,012	7,012	7,012	7,012
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Panel B. % CSR contracting as the main independent variable

	% CSR contracting	NCSKEW	% CSR contracting	DUVOL
Variables	(1)	(2)	(3)	(4)
Constituency statute$_{t-1}$	0.020***		0.020***	
	(2.63)		(2.63)	
Instrumented % CSR contracting$_{t-1}$		-3.952*		-1.653
		(-1.90)		(-1.53)

(continues)

(continued)

	% CSR contracting	NCSKEW	% CSR contracting	DUVOL
Variables	(1)	(2)	(3)	(4)
$Dturn_{t-1}$	-0.001*	0.059	-0.001*	0.012
	(-1.68)	(1.24)	(-1.68)	(0.63)
$Sigma_{t-1}$	-0.043	-11.949***	-0.043	-3.652***
	(-1.53)	(-4.14)	(-1.53)	(-3.26)
Ret_{t-1}	-0.006	-1.123***	-0.006	-0.300*
	(-1.48)	(-2.72)	(-1.48)	(-1.82)
$Ln(Sales)_{t-1}$	-0.001	0.064	-0.001	0.033
	(-1.22)	(1.19)	(-1.22)	(1.61)
ROA_{t-1}	-0.005	0.254	-0.005	0.138
	(-1.22)	(0.71)	(-1.22)	(1.01)
Mkt. $Leverage_{t-1}$	-0.005	-0.613**	-0.005	-0.295***
	(-1.17)	(-2.50)	(-1.17)	(-2.89)
CEO $chair_{t-1}$	-0.000	-0.035	-0.000	-0.014
	(-0.79)	(-0.72)	(-0.79)	(-0.74)
Board $independence_{t-1}$	0.001	0.146	0.001	0.068
	(0.51)	(0.67)	(0.51)	(0.85)
Observations	5,732	5,732	5,732	5,732
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

5.5.4. Addressing reverse causality concern

Although we have provided evidence supporting the first hypothesis, it is possible that the historical level of crash risk may influence firms' propensity to link CEOs' compensation to CSR criteria. For example, firms more prone to crash are more willing and able to raise more debt capital (Hutton et al., 2009), leading to higher interest expenses and financial constraints in the future. Higher financial constraints reduce firms' ability to protect stakeholders' interests. As a result, managers may cut CSR investments and focus on meeting constrained budgets and maintaining other short-term, profitable investments (e.g., Cohn and Wardlaw, 2016). In this scenario, the higher crash risk may reduce firms' likelihood of adopting CSR contracting.

To alleviate the possibility of reverse causality, we implement a panel regression similar to the baseline regression in Section 5.4.1. However, we use *CSR contracting* and *% CSR contracting* as the dependent variables while using *NCSKEW* and *DUVOL* as the main regressors. All control

variables ($X_{i,t-1}$) as in the baseline specification, industry and year-fixed effects are included in this regression, as follows:

$$CSR\ contracting_t = \beta \times Crash\ risk_{i,t-1} + \gamma X_{i,t-1} + Industry_i + Year_t + \epsilon_{i,t} \quad (4)$$

If our results are not affected by reverse causality, we should expect the coefficients of lagged *NCSKEW* and lagged *DUVOL* to be insignificant across all regressions. Table 5.10 provides the regression results of equation (4). As predicted, we find that the coefficients of lagged *NCSKEW* and lagged *DUVOL* are insignificant across all regressions, thereby mitigating the reverse causality concern.[69]

Table 5.10. Addressing reverse causality concern

This table examines the possibility of the impact of crash risk on CSR contracting. The dependent variables are *CSR contracting* and *% CSR contracting*. *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. The main explanatory variables are *negative skewness (NCSKEW)* and *down-to-up volatility (DUVOL),* as specified in Section 5.3.2.2. The same set of control variables and fixed effects, as in the baseline regression (Table 5.2), are included. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the Appendix.

	CSR contracting		% CSR contracting$_{t-1}$	
VARIABLES	(1)	(2)	(3)	(4)
NCSKEW$_{t-1}$	0.001		-0.000*	
	(0.14)		(-1.84)	
DUVOL$_{t-1}$		0.054		0.001
		(1.23)		(0.56)
Dturn$_{t-1}$	-0.016	-0.018	-0.001**	-0.001**
	(-1.07)	(-1.16)	(-2.42)	(-2.46)
Sigma $_{t-1}$	-1.891	-1.662	0.013	0.016
	(-1.17)	(-0.98)	(0.25)	(0.29)
Ret $_{t-1}$	-0.280	-0.268	-0.003	-0.003
	(-1.30)	(-1.23)	(-0.48)	(-0.44)
Ln(Sales) $_{t-1}$	0.059***	0.059***	0.002***	0.002***
	(4.70)	(4.71)	(3.20)	(3.21)
ROA $_{t-1}$	-0.218	-0.210	0.003	0.003
	(-1.38)	(-1.32)	(0.62)	(0.64)
Mkt. Leverage $_{t-1}$	0.026	0.026	0.004	0.004

(continues)

[69] The results remain unchanged if we use *Crash* to measure the level of crash risk and estimate the impact of a one-year-lagged *Crash* on CSR contracting measures using logistic regressions.

(continued)

	CSR contracting		% CSR contracting$_{t-1}$	
VARIABLES	(1)	(2)	(3)	(4)
	(0.23)	(0.24)	(1.11)	(1.11)
CEO chair $_{t-1}$	-0.035	-0.035	-0.002**	-0.002**
	(-1.55)	(-1.55)	(-2.18)	(-2.18)
Board independence $_{t-1}$	0.171**	0.171**	0.000	0.000
	(2.15)	(2.15)	(0.16)	(0.16)
Observations	7,230	7,230	5,802	5,802
R-squared	0.25	0.25	0.20	0.20
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

5.6. CSR contracting, accounting and reporting policies

Our results to this point show that the presence of CSR contracting is negatively correlated with crash risk. We interpret this result as an indication of the adverse effect of CSR contracting on CEOs' incentive to withhold bad news and the resultant crash risk. This finding is consistent with the managerial bad news hoarding story of Jin and Myers (2006). In this section, we further examine changes in corporate policies that CEOs may adopt to accelerate bad news recognition. From this analysis, we can gain insights into the mechanisms leading to the moderating impact of CSR contracting on crash risk. Our main argument is that if CEOs are less likely to accumulate bad news due to having CSR criteria in their contracts, they should adjust accounting and reporting policies that accelerate the recognition of bad news and release it to the market more quickly.

First, we conjecture that incentivised CEOs would report more conservatively. Prior accounting literature shows that accounting conservatism may prevent managerial opportunistic behaviour from concealing adverse information, given managers' bonus plans and career concerns, thus alleviating crash risk. Basu (1997) interpret conditional conservatism as accountants' tendency to require a higher degree of verification to recognise good news as gains than bad news as losses in financial reporting. As discussed previously, CEOs have different incentives to provide misleading information to the market to maximise their interests, such as managerial

shareholdings of firms, compensation plans, career concerns, and the amount of corporate resources under management control. Because these benefits directly link to "hard" accounting numbers in financial statements and the resultant stock returns, CEOs may behave myopically and delay bad news to make firms' performance look promising. In this context, applying a conservative reporting policy offsets CEOs' tendency to accelerate good news and delay bad news (LaFond and Watts, 2008).

Second, accounting conservatism disciplines various "soft" information sources that may be inconsistent with audited financial statements, such as CEOs' voluntary disclosures. Suppose that firms apply accounting conservatism and increase the reliability of financial statements. In that case, investors may use accounting numbers as benchmarks to evaluate different competing sources of soft information and learn more about managerial reporting strategies (LaFond and Watts, 2008), thus uncovering CEOs' misleading disclosures quicker. In addition, Ball and Shivakumar (2005) and Kim and Zhang (2016) posit that if losses are recognised in a timelier manner, shareholders and boards may identify and eliminate value-destroying projects promptly. In this vein, accounting conservatism rules out bad performance and the accumulation of bad news that makes firms more prone to crash. Overall, the risk of large declines in stock price would be reduced if CEOs report more conservatively (Kim and Zhang, 2016).

To this point, our evidence is consistent with the bad news hoarding story that CSR contracting reduces managerial incentives to withhold bad news. Since conservative financial reporting is an effective governance mechanism that prevents the accumulation of adverse information, it is a potential channel that leads to the adverse relationship between CSR contracting and crash risk. Indeed, a two-period model developed by Glover and Xue (2022) suggests that accounting conservatism strengthens relationships between managers and increases managerial horizons. According to the authors, because conservatism imposes higher (lower) standards to recognise good news (bad news), a report of a low performance in the previous period is followed by a report of a good performance in the next period due to accruals. This process increases CEOs' stakes in future performance and motivates them to stay longer (through bad times in the first period) in the relationships with other managers, thus addressing the horizon problem (Glover

and Xue, 2022). In this vein, the managers-managers' and managers-stakeholders' relationships are fostered. This effect of accounting conservatism on the managerial horizon is consistent with Flammer et al. (2019), who show that incentivised CEOs demonstrate stronger attention to long-term corporate strategies and value creation (i.e., longer organisational time horizon). Thus, it is possible that CEOs having CSR criteria in their compensation are under stronger pressure to report more conservatively, making firms less prone to crash.

Second, we conjecture that incentivised CEOs should report more transparently. Extant literature on crash risk posits that corporate opaqueness, which is defined as the lack of information that allows investors to value firms correctly, is one of the major factors that increase the crash likelihood. Jin and Myers (2006) argue that firms with more hidden private information enable managers to capture more (less) firms' cash flow if the information itself is positive (negative). Even if the information is negative, managers may still absorb it if managers' gains from hiding adverse information exceed the corresponding costs. When the costs of absorbing any additional adverse information are sufficiently large, managers may abandon absorbing and release all accumulated hidden information to the market, causing stock price crashes. This argument is further confirmed by Hutton et al. (2009), who show that using discretionary accruals, which increases firms' opaqueness, leads to a higher risk of crash. Thus, it is possible that CSR contracting induces CEOs to report more transparently, reduce adverse information accumulation, and thus reduce the crash likelihood.

For our empirical tests, we use two different measures of conditional conservatism in Basu (1997), Ball and Shivakumar (2005), and Ball and Shivakumar (2006). In particular, Basu (1997) measure the asymmetric timeliness of the recognition of good news versus bad news. Following Kim and Zhang (2016), we estimate Basu's (1997) measure by implementing the following piecewise regression:[70]

$$\frac{Net\ Income_{i,t}}{Market\ value\ of\ equity_{i,t-1}} = \beta_1 + \beta_2 Ret_{i,t} + \beta_3 D_{i,t} + \beta_4 Ret_{i,t} \times D_{i,t} + \epsilon_{i,t}$$

[70] Sources of data to construct variables are reported in the Appendix: Definitions of variables

Where $Ret_{i,t}$ is the compound rate of return over 12 months before the end of a fiscal year *t* of firm *i*. $D_{i,t}$ is a dummy variable that equals one if $Ret_{i,t}$ is negative, and zero otherwise. Basu (1997) interpret this regression that if the coefficient β_4 is large and positively significant, then the sensitivity of earnings to reporting adverse information is larger. In other words, when Basu's (1997) coefficient is larger, firms recognise bad news more quickly and reflect this promptly in reported earnings (i.e., firms report more conservatively).

The second measure of conservatism we use in this research is an accruals-based measure of asymmetric timeliness of good news versus bad news by Ball and Shivakumar (2005) and Ball and Shivakumar (2006). Following Kim and Zhang (2016), we construct this measure by implementing the following piecewise regression:[71]

$$ACC_{i,t} = \beta_0 + \beta_1 \Delta Rev_{i,t} + \beta_2 GPPE_{i,t} + \beta_3 DCF_{i,t} + \beta_4 CF_{i,t} + \beta_5 DCF_{i,t} \times CF_{i,t} + \epsilon_{i,t}$$

where $ACC_{i,t}$ is accruals of firm *i* in year *t*, calculated as (change in current assets – change in cash) – (change in current liabilities – change in current debt – change in tax payable). $\Delta Rev_{i,t}$ is the change in revenue (i.e., $Rev_t - Rev_{t-1}$) divided by average total assets. *GPPE* is gross property, plant, and equipment divided by average total assets. $DCF_{i,t}$ is a dummy variable that equals one if a firm's industry median-adjusted operating cash flow is negative, and zero otherwise. A firm's operating cash flow is calculated as (income before extraordinary items – current accruals + depreciation). Then, industry median-adjusted operating cash flow is calculated as operating cash flow minus a firm's industry's median operating cash flow, divided by average total assets. A larger estimate of Ball and Shivakumar's coefficient (i.e., β_5) means more incremental timeliness of accruals in reflecting negative news regarding cash flow (i.e., more conditional conservatism).

Last, to construct a measure of firms' opaqueness, following Jin and Myers (2006), we use the dispersion (i.e., standard deviation) of analysts' forecasts of earnings per share (EPS). We name this variable as *EPS forecast dispersion*. If CEOs generate more transparent reports, accounting

[71] Sources of data to construct variables are reported in the Appendix: Definitions of variables

numbers would be less misleading, enabling more accurate and homogenous analysts' forecasts. As a result, the standard deviation of analysts' earnings forecasts should decrease.

Table 5.11 presents the regression results of our analysis, exploring the underlying channels that contribute to the negative association between CSR contracting and crash risk. In Panel A of Table 5.11, we regress Basu's (1997) and Ball and Shivakumar's (2005, 2006) accounting conservatism measures on CSR contracting measures. We find that the coefficients of *CSR contracting* and *% CSR contracting* are positive and significant, suggesting that CEOs with CSR contracting report more conservatively. For example, the presence of CSR contracting provisions increases Basu's and Ball and Shivakumar's measures by 0.044 and 0.391, respectively.

In Panel B of Table 5.11, we report the regression results using *EPS forecast dispersion* as the dependent variable. We find that the coefficients of *CSR contracting* and *% CSR contracting* are negative and significant at the 5% level, suggesting that incentivised CEOs improve the transparency of firms' financial reports and reduce the dispersion of analysts' earnings forecasts. In particular, the presence of CSR contracting reduces analysts' forecasting dispersion by 0.063, which is equivalent to 27.19% relative to the sample mean. Similarly, a one percent increase in *% CSR contracting* reduces analysts' forecasting dispersion by 1.271%, which is equivalent to 5.49% relative to the sample mean. Collectively, the above evidence indicates that CSR contracting induces CEOs to report more conservatively and transparently, reducing the accumulation of bad news and the likelihood of a stock price crash.

Table 5.11. The impact of CSR contracting on reporting policy

This table examines the impact of CSR contracting on firm reporting policy. Panel A examines the impact of CSR contracting on the conservatism of a firm's accounting reports. The dependent variables are measures of the degree of accounting conservatism constructed by Basu (1997) and Ball and Shivakumar (2005), as specified in Section 5.6. Panel B examines the impact of CSR contracting on the transparency of a firm's reports, measured by *EPS forecast dispersion*. *EPS forecast dispersion* is the standard deviation of analysts' forecasts of a firm's earnings per share for a fiscal year. The main explanatory variables in both panels are *CSR contracting* and *% CSR contracting*. *CSR contracting* is a binary variable that equals one if a firm adopts CSR contracting, and zero otherwise. *% CSR contracting* is a continuous variable measuring the ratio of CSR-based compensation to total CEO compensation. The same set of control variables and fixed effects, as in the baseline regression (Table 5.2), are included. Statistical significance is based on the heteroscedasticity-robust firm-clustered standard errors. t-statistics are presented in parentheses. The levels of significance are denoted by *, **, and *** for 10%, 5%, and 1% levels of significance, respectively. All variables are defined in the Appendix.

Panel A. The impact of CSR contracting on accounting conservatism

	Basu's (1997)		Ball and Shivakumar's (2005)	
Variables	(1)	(2)	(3)	(4)
CSR contracting$_{t-1}$	0.044***		0.391*	
	(2.743)		(1.754)	
% CSR contracting$_{t-1}$		0.861*		14.970**
		(1.908)		(2.138)
Dturn$_{t-1}$	0.032**	0.040**	-0.248	-0.116
	(2.143)	(2.349)	(-1.201)	(-0.487)
Sigma $_{t-1}$	-1.609	-1.261	12.997	17.796
	(-1.471)	(-1.077)	(0.921)	(1.305)
Ret $_{t-1}$	-0.117	-0.045	1.790	2.686
	(-0.622)	(-0.212)	(0.755)	(1.086)
Ln(Sales) $_{t-1}$	0.076***	0.076***	-0.280	-0.341**
	(7.580)	(6.494)	(-1.590)	(-2.000)
ROA $_{t-1}$	0.113	0.096	-0.968	-1.968
	(0.762)	(0.599)	(-0.628)	(-1.312)
Mkt. Leverage $_{t-1}$	0.338***	0.404***	1.472	0.621
	(3.004)	(3.066)	(1.442)	(0.616)
CEO chair $_{t-1}$	-0.070***	-0.068***	-0.090	0.074
	(-3.669)	(-3.134)	(-0.401)	(0.343)
Board independence $_{t-1}$	0.120	0.085	-1.637**	-1.672**
	(0.945)	(0.583)	(-1.984)	(-2.128)
Observations	5,412	4,271	2,369	1,909
R-squared	0.227	0.199	0.133	0.141
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Panel B. The impact of CSR contracting on reporting transparency

	Dependent: EPS forecast dispersion	
Variables	(1)	(2)
CSR contracting$_{t-1}$	-0.063**	
	(-2.155)	
% CSR contracting$_{t-1}$		-1.271**
		(-2.084)
Dturn$_{t-1}$	0.037	0.045
	(0.377)	(0.384)
Sigma $_{t-1}$	3.355	3.337
	(0.720)	(0.613)
Ret $_{t-1}$	0.064	0.012
	(0.073)	(0.012)

(continues)

(continued)

	Dependent: EPS forecast dispersion	
Variables	(1)	(2)
Ln(Sales) $_{t-1}$	0.040**	0.043**
	(2.410)	(2.242)
ROA $_{t-1}$	-0.203	-0.236
	(-0.899)	(-1.003)
Mkt. Leverage $_{t-1}$	0.650***	0.703***
	(3.315)	(2.919)
CEO chair $_{t-1}$	-0.068	-0.076
	(-1.072)	(-0.942)
Board independence $_{t-1}$	-0.284	-0.340
	(-1.176)	(-1.199)
Observations	7,088	5,775
R-squared	0.016	0.016
Industry FE	Yes	Yes
Year FE	Yes	Yes

5.7. Conclusion

In this study, we investigate the impact of a novel governance practice, which aligns CEO compensation with CSR performance metrics, on the risk of stock price crashes. This risk is quantified by the frequency of significant share price drops and the negative skewness of return distribution. The rationale behind our research is that CSR performance criteria, which explicitly require CEOs to allocate financial resources to CSR activities, reduce CEOs' incentives and abilities to sacrifice stakeholders' value to manage earnings upward and conceal bad news. As a result, bad news is recognised more quickly, and investors are less surprised when adverse information reaches the market, thereby reducing the likelihood of large price declines. We provide evidence that the presence and the share of CSR contracting in CEO compensation packages are negatively related to the future crash risk. This finding is robust to different checks that reduce endogeneity concerns.

Nevertheless, it is essential to note that the relationship between CSR contracting and stock price crash risk varies across firms and circumstances. We find that the effect of CSR contracting on crash risk is more pronounced when firms have greater reliance on stakeholders' implicit claims,

higher earnings volatility, and incorporated US counties with higher levels of religiosity. These findings strengthen our baseline results and alleviate potential endogeneity concerns, since it is difficult for omitted factors to cause similar biases in all regressions when different dimensions of the underlying relationship are considered.

Exploring mechanisms leading to the crash risk-reduction effect of CSR contracting, we find evidence that incentivised CEOs report more conservatively and transparently, as reflected in lower analysts' earnings forecast dispersion. Overall, while firms' primary objective in adopting CSR contracting is to direct managers' focus on stakeholders' interests, we shed light on the by-products of CSR contracting on accounting and reporting policies, corporate information environment, and market sustainability. Flammer et al. (2019) argue that CSR contracting reduces managerial short-termism and lengthens their horizons. In this sense, our study provides evidence that CSR contracting effectively constrains managerial short-termism by discouraging bad news hoarding, thus complementing the argument of Flammer et al. (2019) about the benefits of CSR-based compensation.

Chapter 5 Appendix: Definitions of variables

Variables	Definitions	Sources
CSR contracting measures		
CSR contracting	Indicator equal to one if a firm adopts CSR contracting provision, and zero otherwise.	Form DEF 14A, SEC's EDGAR
% CSR contracting	The actual percentage of CSR-based compensation over total CEO compensation.	Form DEF 14A, SEC's EDGAR
Crash risk measures		
NCSKEW	The negative skewness of firm-specific weekly returns in a specific fiscal year.	CRSP
DUVOL	The natural logarithm of the ratio of the standard deviation of down-week returns (i.e., weeks having returns lower than the mean of firm-specific weekly returns) to up-week returns (i.e., weeks having returns lower than the mean of firm-specific weekly returns).	CRSP
Crash	A dummy variable that takes the value one if at least one week (in a fiscal year) has firm-specific weekly returns that are 3.2 standard deviations below the mean of firm-specific weekly returns.	CRSP
Control variables		
Dturn	First, monthly share turnover is calculated as the trading volume, divided by the total number of shares outstanding within a specific month. Then Dturn is calculated as the change of average monthly share turnover of year t compared to year t-1.	CRSP
Sigma	The standard deviation of firm-specific weekly return in a fiscal year.	CRSP
Ret	The mean of firm-specific weekly returns in a fiscal year.	CRSP
Ln(Sales)	The natural logarithm of firm sales.	Compustat
ROA	Earnings before interest and taxes divided by total book assets.	Compustat
Mkt. leverage	The sum of current liabilities and long-term debt divided by the sum of debt and market equity.	Compustat
CEO chair	Indicator equal to one if the CEO is also the chairman of the board of directors, and zero otherwise.	ISS

Variables	Definitions	Sources
Board independence	The number of independent directors divided by board size.	ISS
Conditional conservatism and forecast dispersion measures		
Basu's (1997) measure	The market-based timeliness of earnings in recognising bad news compared to good news. The measure is constructed following Basu (1997).	Compustat & CRSP
Ball and Shivakumar's (2005) measure	The accrual-based timeliness of earnings in recognising bad news compared to good news. The measure is constructed following Ball and Shivakumar (2005, 2006).	Compustat
EPS forecast dispersion	The standard deviation of analysts' forecasts of firms' earnings per share for a fiscal year.	ExecuComp
Instrument		
Constituency statutes	Indicator equal to one if a firm incorporates in a state that enacts constituency statute, and zero otherwise.	Karpoff & Wittry (2018)
Implicit claims, earnings volatility, and Religious adherents		
Customers' implicit claims	R&D expenses scaled by total assets.	Compustat
Sales per employee	A firm's sales divided by the number of employees in a fiscal year.	Compustat
Earnings volatility	The standard deviation of net income scaled by total equity of four quarters within a fiscal year.	Compustat
Religious adherents	The number of religious adherents living in a US county divided by the total population of this county.	American Association of Religion Data Archives (ARDA)

Chapter 6. Thesis conclusion

6.1. Introduction

To this point, this thesis has thoroughly examined the impacts of CSR contracting on managerial decision-making processes and subsequent firm outcomes. In this conclusion chapter, we summarise the key findings and contributions of each following empirical chapter to the literature. Chapter 3 examines the impact of CSR contracting on CEOs' repurchase decisions and considers this relationship under the perspectives of the optimal contracting and rent-extraction hypotheses. Chapter 4 examines the impact of CSR contracting on firm risk, firm performance, and CEOs' risk-taking decisions reflected through the choices of investment and financial policies. Chapter 5 examines whether CSR contracting affects managerial bad news hoarding and the stock price crash risk.

The chapter proceeds as follows. Section 6.2 summarises the main empirical findings and contributions of Chapters 3 to 5. Section 6.3 discusses the limitations of our research. Section 6.4 provides suggestions for prospective research avenues concerning CSR contracting.

6.2. Summary of key findings and contributions

To address recent social and environmental concerns, various stakeholders, including investors, regulators, and the general public, have taken initiatives to establish norms and ESG-related legal systems. They are increasingly urging companies to adhere to these standards by incorporating social and environmental objectives into corporate strategies. Responding to these pressures, many firms are transitioning from the shareholder primacy view to the stakeholder governance model. As part of this transition, a novel remuneration scheme involving tying CEO compensation to CSR performance metrics, known as CSR contracting, is believed to motivate effective managerial actions toward building a more sustainable economy.

Nevertheless, numerous external and internal challenges in designing effective CSR contracting provisions exist, such as the continuous evolution of ESG-related regulations, the lack of standards in collecting and constructing CSR databases for target setting, and the lack of best practices in disclosing CSR-based compensation. These challenges give rise to several important,

yet unanswered, questions. For example, how do managerial behaviour and management approaches change when CEOs are incentivised by CSR pay? Do incentivised CEOs genuinely dedicate themselves to improving CSR outcomes? Are stakeholder-oriented managerial decisions value-creating, or value-destroying, from a shareholder perspective? Given the increasing prevalence of CSR contracting and its significance in total CEO compensation, answering these questions is imperative to uncover the real effects and economic implications of this remuneration scheme. By doing so, the pros and cons of CSR contracting can be exposed, allowing the boards and regulators to enhance the effectiveness of CSR pay.

In this context, this thesis takes a significant step forward in enhancing our comprehensive understanding of CSR contracting. By manually constructing a unique and novel dataset that outlines the implementation of CSR contracting among S&P 500 companies over an extensive period from 2000 to 2018, we empirically examine and establish the relationships between CSR contracting and CEO decision-making and firm outcomes. Specifically, we investigate the impact of CSR contracting on share repurchase decisions, corporate risk-taking, and managerial bad news stockpiling. We summarise our empirical findings and contributions to the literature, as follows.

In the empirical Chapter 3, we examine the relationship between CSR-based compensation and CEOs' repurchase decisions. First, our analyses reveal that CEOs with CSR contracting tend to reduce and avoid repurchasing shares. We highlight CEOs' preference for significant CSR-related investments, leading them to conserve financial assets these investments rather than allocate surplus cash to shareholders. This finding reveals that CSR contracting is a potential mechanism that has visible impacts on firms' payout policies. In this vein, we contribute to a strand of literature that links different aspects of executive compensation to share repurchases, such as option compensation (Dittmar, 2000; Fenn and Liang, 2001; Kahle, 2002), vesting equity (Edmans et al., 2022), and earnings-contingent bonus (Hribar et al., 2006; Cheng et al., 2015). Second, the adverse effect of CSR contracting on share repurchases is more substantial for firms having higher investment opportunities and higher cash flow volatility, which is consistent with managerial responses in Brav et al. (2005). Last, exploring the impact of CSR contracting on dividend policy, we did not find evidence suggesting that dividends are reduced for similar

reasons as share repurchases or that dividends serve as a substitute for repurchases in distributing excess cash to shareholders. This finding contributes to a strand of research about corporate choices of payout methods between share repurchases and dividends. Accordingly, firms tend to allocate surplus cash through share repurchases rather than dividends, especially when they require financial flexibility to respond to unforeseen risks and opportunities, thus evading any dividend cuts (Brav et al., 2005; Jagannathan et al., 2000). Our results support this view by showing that incentivised CEOs only refer to repurchase reduction as a strategy to preserve financial resources, especially when CSR-related risks and opportunities are evolving and require more corporate flexibility.

Last, our research is close to but distinct from Bliss et al. (2015). Specifically, Bliss et al. (2015) show that, during the 2008-2009 financial crisis, firms reduced repurchases to build cash reserves and fund strategic investments. The authors argue that executives view reducing repurchases as an alternative form of financing during challenging times. In line with Bliss et al. (2015), our findings support the notion that CEOs with CSR contracting enhance stakeholder value by pursuing CSR investment projects, resulting in the reduction of share repurchases. Nevertheless, our research differs from Bliss et al. (2015) in that we do not study how CSR contracting adopters utilise cash savings from repurchase reduction. This is because these savings can only be observed among firms that repurchase shares regularly. Instead, our study focuses on the presence of CSR contracting provisions as a general practice among firms, rendering the analysis of cash savings irrelevant.

Although the use of preserved financial resources and the mechanisms leading to a conservative repurchase policy are not observable, Chapter 3 suggests a direction to examine the effects of CSR contracting more comprehensively by focusing on the conservativeness of CEOs' decisions. Therefore, in the empirical Chapter 4, we examine the impacts of CSR contracting on managerial risk-taking. Our results show that both the presence and the substantiveness of CSR contracting adversely affect managerial risk-taking, which is reflected in the lower level of future firm risk. The impact is stronger when firms are highly financially constrained and reside in areas with higher levels of social capital. Given that stakeholders have illiquid claims against firms that are

susceptible to downside risks, our findings lend support to the notion that incentivised CEOs manage risk more prudently to balance the risk preferences of shareholders and stakeholders (Gao et al., 2021; Jensen & Meckling, 1976). In this vein, we show that CSR contracting is a novel remuneration scheme that can influence managerial risk-taking, in addition to other designs, such as the provision of equity-based compensation (Coles et al., 2006; Core & Guay, 2002; Guay, 1999), performance-vesting equity (Bettis et al., 2018), and relative performance valuation (Do et al., 2022).

Second, our findings relate to the outcomes of addressing the conflict of interests, not only between managers and shareholders, but also between managers, shareholders, and non-shareholder stakeholders. Specifically, CEOs may be overly risk-averse due to their firm-specific human capital and avoid undertaking risky yet profitable investments (Gibbons & Murphy, 1992; Guay, 1999). To counter this behaviour, firms offer managers more risk-taking incentives, such as greater pay convexity (Jensen and Meckling, 1976; Coles et al., 2006; Chen et al., 2022). Nevertheless, CEOs' increased risk-taking is harmful to stakeholders with limited protection against financial constraints (Cohn & Wardlaw, 2016). Thus, CSR contracting helps to balance this conflict of risk preferences by alleviating excessive managerial risk-taking. Third, our finding contributes to the broad view about the role of diversity in moderating corporate risk-taking (Adams et al., 2005; Bernile et al., 2018). Consistent with this view, our study provides empirical evidence suggesting that the diversity in executive incentives moderates the extremity of managerial decisions.

Our further analyses reveal that incentivised CEOs manage risk more prudently by pursuing conservative financial and investment policies. Moreover, we rule out the rent-extraction hypothesis that the risk-reduction effect of CSR contracting is due to the opportunistic behaviour of CEOs to enjoy a quiet life. We also document that the risk-reduction effect of CSR contracting is not sub-optimal, since this provision improves firm performance, especially in the face of higher market volatility. Collectively, in line with the optimal contracting view of Flammer et al. (2019) and Cohen et al. (2023), we show that CSR contracting is an efficient compensation design that facilitates more effective risk-taking and creates value for both shareholders and stakeholders.

Last, in empirical Chapter 5, we document an adverse relationship between CSR contracting and stock price crash risk. We also find that this relationship is more pronounced for firms relying more on stakeholders' implicit claims, experiencing higher earnings volatility, and residing in US counties with higher levels of religiosity. These findings suggest that incentivised CEOs are less able and incentivised to withhold bad news through real earnings management when held responsible for specified CSR targets. To the extent that CSR contracting can also alleviate real earnings management, we add to the literature that focuses on equity-based compensation as the main cause of bad news hoarding(e.g., Bergstresser & Philippon, 2006; Burns & Kedia, 2006; Kim et al., 2011a, 2011b). In addition, our further analyses show that CEOs having CSR contracting are more inclined to report more conservatively and transparently. These proactive communication strategies help prevent the detrimental accumulation of bad news that can lead to stock crashes upon revelation. Thus, the empirical findings of Chapter 5 lend support to the notion that CSR contracting improves the effectiveness of managerial decisions that create value for various stakeholders while enhancing the stability and sustainability of the market.

Collectively, the thesis presents compelling and reliable evidence supporting the notion that CSR-based compensation is an efficient remuneration scheme. While CSR contracting aims to safeguard stakeholder interests, this approach motivates more calculated repurchase decisions, fosters more effective risk-taking decisions, and encourages timely and transparent corporate disclosures. These findings are consistent with the assertions made by Flammer et al. (2019) and Hong (2017) that tying executive compensation to CSR performance serves as an effective incentive, showcasing CEOs' dedication to enhancing firm value. As a result, we align ourselves with the optimal contracting perspective on CSR contracting while countering the managerial power hypothesis supported by Bebchuk & Tallarita (2022).

6.3. Research limitations

Although we have implemented rigorous checks to ensure the robustness of our results and mitigate endogeneity concerns, there are still several constraints in our research presented in Chapters 3 to 5. The first limitation pertains to our data sample. As we manually collect information from firms' proxy statements, our sample is limited to S&P 500 companies. The

advantage of this approach lies in keeping the data collection process manageable and justifying that the practices of large and publicly visible firms may exert significant influence on smaller firms. Nevertheless, there are three notable drawbacks to this approach. First, our findings and contributions cannot be generalised to firms outside the United States. Indeed, firms operating in different jurisdictions may encounter distinct business environments, operating models, corporate governance practices, and varying degrees of pressure from the public to adopt CSR contracting. As a result, the observed impacts of CSR contracting on firm outcomes in this thesis may not hold true for international firms. To address this limitation, future research could encompass international CSR contracting practices, following the approach by Cohen et al. (2023).

Another limitation resulting from focusing on S&P500 firms is that this approach restricts our ability to investigate how mid-cap and small-cap firms use CSR contracting. Smaller firms, in contrast to their larger counterparts, may possess limited resources for CSR investments and less developed governance systems to oversee managerial behaviour effectively. Consequently, there is a concern regarding the potential symbolic utilization of CSR contracting, lacking substantial impact. Furthermore, while we have examined the impacts of the presence and substantiveness of CSR contracting, we missed the opportunity to explore the effects of other aspects, such as the selection and dimensions of CSR metrics and the forms of CSR compensation (e.g., cash, options, shares). Nevertheless, as Section 1.4 of Chapter 1 indicates, these aspects are unevenly distributed, with most selected firms adopting employee-related metrics and providing short-term cash rewards. Overall, these issues are attributed to our data collection strategy, which could be improved by expanding the selection of sample firms.

The second limitation of our study pertains to the chosen sample period, as discussed in Section 1.4 of Chapter 4. Our dataset encompasses firm years from 2000 to 2018, which introduces a challenge due to changes in regulatory requirements governing executive compensation disclosures. Specifically, the introduction of the 2006 disclosure rules mandated firms to transparently disclose various aspects of executive compensation contracts in a distinct section of the proxy statement, known as "Compensation Analysis and Discussion." Consequently, a disparity in data quality arises between observations before and after 2006. Prior to this regulation,

firms were not obligated to disclose information about CSR-based compensation, whereas post-2006, strict reporting requirements have been in place.

This discrepancy raises concerns about sample selection bias since our manually collected sample may exclude CSR contracting adopters who did not provide relevant disclosures prior to the 2006 rule change. One potential omitted factor stemming from this selection bias is the influence of corporate culture. It is plausible that firms characterized by transparency and a stakeholder-oriented culture may exhibit a greater propensity to adopt CSR contracting and explicitly detail CSR-based compensation in their proxy statements, thus potentially moderating executive risk-taking behaviour (Li et al., 2013). This factor could potentially confound the observed impacts of CSR contracting on corporate policies and firm outcomes, as explored in this thesis. One potential remedy for this issue is to restrict our sample period from 2006 to 2018, which, unfortunately, results in a substantial reduction in sample size. Therefore, it is crucial to be cognizant of the trade-off inherent in addressing this sample selection bias and to approach the interpretation of our empirical findings with caution.

The third limitation of our study is related to our focus on the behaviour of incentivised CEOs rather than examining other top executives within the firms. This approach was chosen to isolate the impacts of CSR contracting on the most influential and powerful executive within the top management team, thereby reducing potential noise introduced by including non-CEO executives, who may have limited impacts on the firm's decisions (e.g., Chief Technology Officers, Chief Operating Officers). Nevertheless, expanding our analyses to include other executives could serve as an alternative strategy to test the robustness of our results and develop a more comprehensive understanding of the effects of CSR contracting. For instance, Chief Financial Officers (CFOs) hold a crucial responsibility in securing the necessary financial resources for CSR initiatives. A study by Jiang et al. (2010) highlights that CFOs' equity-based incentives are more influential than those of CEOs in explaining earnings management and the likelihood of meeting or beating analyst forecasts. This aligns with the findings of Chava and Purnanandam (2010), who demonstrate that CFO incentives significantly impact decisions related to earnings smoothing. Additionally, Kim et al. (2011a) find that it is CFOs' option incentives, rather than those of CEOs,

that are significantly and positively correlated with a firm's susceptibility to stock price crashes. In light of this perspective, it is possible that the inclusion of CSR-based provisions in CFOs' contracts, alongside those of CEOs, may hold significance in explaining the impacts of CSR contracting on share repurchases and earnings management decisions discussed in Chapters 3 and 5 of this thesis. In addition to the roles of CFOs, an increasing number of firms are employing Chief Sustainability Officers (CSOs) to advise CEOs on sustainability-related matters (Fu et al., 2020). Overall, expanding empirical analyses to capture CSR contracting in non-CEO compensation contracts would enhance our comprehension of CSR contracting effects on firm outcomes.

Last, despite employing different approaches to mitigate endogeneity concerns, we cannot entirely rule out the potential for omitted variable bias in our findings. For example, if certain firms adopt CSR contracting due to peer influence while others in the same industry do not, the assignment of CSR-based compensation may not be entirely random. As a result, the established relationships in our study could still be influenced by unobservable firm characteristics. Due to this possibility, we should interpret our findings with caution. In this context, future research that includes a larger sample size and employs more robust empirical approaches may offer further insights and better address the endogeneity concerns.

6.4. Directions for future research

Our empirical findings contribute to a burgeoning area of research on CSR contracting and suggest valuable avenues for future research. Researchers may consider following our research theme and investigating the impacts of CSR contracting on other important corporate decisions. For instance, examining the interaction between CSR contracting and merger decisions presents an intriguing topic. Mergers can potentially affect shareholder wealth and intensify risks for stakeholder interests (Deng et al., 2013). Therefore, it is plausible that CEOs with CSR contracting may pursue a more conservative approach to mergers to protect stakeholder interests. In addition, future research may delve into the potential effects of CSR contracting on managerial tax avoidance. Previous studies have indicated that corporate tax avoidance facilitates earnings management and increases the risk of stock price crashes (Kim et al., 2011b). Considering our

findings regarding the adverse impact of CSR contracting on crash risk, it is worth exploring whether a relationship exists between CSR contracting and corporate tax avoidance.

Another promising avenue for future research involves exploring whether the adoption of CSR contracting fosters more sustainable relationships between firms and various stakeholders. For example, Flammer (2018) reveals that superior CSR performance enhances firms' relationships with governments and increases the likelihood of winning governmental procurement contracts. Given that CSR contracting incentivises more effective managerial efforts toward CSR, it is possible that CSR contracting would further facilitate the business relationship between firms and governmental customers. In addition, researchers can explore whether CSR contracting leads to more employee-related initiatives that enhance workforce productivity and firm value, as proposed by Edmans (2012). Understanding the link between CSR contracting, employee engagement, and firm performance would shed light on the broader impacts of this incentive structure. Further, considering the evidence suggesting a connection between executive compensation and customer-base structure (Liu et al., 2021; Chen et al., 2022), future research may examine whether CSR contracting enhances the duration of the customer-base relationship and the trade premiums that firms can gain from it. This inquiry would provide valuable insights into how CSR-based compensation affects firms' market positioning and customer loyalty. Alternatively, researchers may explore whether socially responsible customers influence firms (i.e., suppliers) to pursue CSR initiatives and subsequently adopt CSR contracting, as suggested by Dai et al. (2021).

References

Adams, R.B., Almeida, H. and Ferreira, D. 2005. Powerful CEOs and their impact on corporate performance. *Review of Financial Studies*. **18**(4), pp.1403–1432.

Albuquerque, R., Koskinen, Y. and Zhang, C. 2019. Corporate social responsibility and firm risk: Theory and empirical evidence. *Management Science*. **65**(10), pp.4451–4469.

An, B.-J., Ang, A., Bali, T.G. and Cakici, N. 2014. The joint cross section of stocks and options. *Journal of Finance*. **69**(5), pp.2279–2337.

Armstrong, C.S. and Vashishtha, R. 2012. Executive stock options, differential risk-taking incentives, and firm value. *Journal of Financial Economics*. **104**(1), pp.70–88.

Bagwell, L.S. 1991. Share repurchase and takeover deterrence. *Rand Journal of Economics*. **22**(1), pp.72–88.

Ball, R. 2009. Market and political/regulatory perspectives on the recent accounting scandals. *Journal of Accounting Research*. **47**(2), pp.277–323.

Ball, R. and Shivakumar, L. 2005. Earnings quality in UK private firms: Comparative loss recognition timeliness. *Journal of Accounting and Economics*. **39**(1), pp.83–128.

Ball, R. and Shivakumar, L. 2006. The role of accruals in asymmetrically timely gain and loss recognition. *Journal of Accounting Research*. **44**(2), pp.207–242.

Bansal, P. 2005. Evolving sustainably: A longitudinal study of corporate sustainable development. *Strategic Management Journal*. **26**(3), pp.197–218.

Bansal, P. and Roth, K. 2000. Why companies go green: a model of ecological responsiveness. *Academy of management journal*. **43**(4), pp.717–736.

Basu, S. 1997. The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting and Economics*. **24**(1), pp.3–37.

Bebchuk, L., Cohen, A. and Ferrell, A. 2009. What matters in corporate governance? *Review of Financial Studies*. **22**(2), pp.783–827.

Bebchuk, L. and Fried, J.M. 2003. Executive compensation as an agency problem. *Journal of Economic Perspectives*. **17**(3), pp.71–92.

Bebchuk, L.A. and Fried, J.M. 2006. Pay without performance: overview of the issues. *Academy of Management Perspectives*. **20**(1), pp.5–24.

Bebchuk, L.A. and Tallarita, R. 2022. The perils and questionable promise of ESG-based compensation. *Journal of Corporation Law*. **48**(1), pp.37–75.

Benmelech, E., Kandel, E. and Veronesi, P. 2010. Stock-based compensation and CEO (dis)incentives. *Quarterly Journal of Economics*. **125**(4), pp.1769–1820.

Ben-Nasr, H. and Ghouma, H. 2018. Employee welfare and stock price crash risk. *Journal of Corporate Finance*. **48**, pp.700–725.

Ben-Zion, U. and Shalit, S.S. 1975. Size, leverage, and dividend record as determinants of equity risk. *Journal of Finance*. **30**(4), pp.1015–1026.

Bergstresser, D. and Philippon, T. 2006. CEO incentives and earnings management. *Journal of Financial Economics*. **80**(3), pp.511–529.

Bernile, G., Bhagwat, V. and Yonker, S. 2018. Board diversity, firm risk, and corporate policies. *Journal of Financial Economics*. **127**(3), pp.588–612.

Berrone, P. and Gomez-Mejia, L.R. 2009. Environmental performance and executive compensation: An integrated agency-institutional perspective. *Academy of Management Journal*. **52**(1), pp.103–126.

Bertrand, M. and Mullainathan, S. 2003. Enjoying the quiet life? Corporate governance and managerial preferences. *Journal of Political Economy*. **111**(5), pp.1043–1075.

Bettis, J.C., Bizjak, J., Coles, J.L. and Kalpathy, S. 2018. Performance-vesting provisions in executive compensation. *Journal of Accounting and Economics*. **66**(1), pp.194–221.

Bhojraj, S., Hribar, P., Picconi, M. and McInnis, J. 2009. Making sense of cents: An examination of firms that marginally miss or beat analyst forecasts. *Journal of Finance*. **64**(5), pp.2361–2388.

Billet, M.T. and Xue, H. 2007. The takeover deterrent effect of open market share repurchases. *Journal of Finance*. **62**(4), pp.1827–1850.

Bizjak, J.M., Brickley, J.A. and Coles, J.L. 1993. Stock-based incentive compensation and investment behavior. *Journal of Accounting and Economics*. **16**(1), pp.349–372.

Blanchard, O.J. and Watson, M.W. 1982. Bubbles, rational expectations and financial markets. *NBER Working Paper Series*., p.945.

Bleck, A. and Liu, X. 2007. Market transparency and the accounting regime. *Journal of Accounting Research*. **45**(2), pp.229–256.

Bliss, B.A., Cheng, Y. and Denis, D.J. 2015. Corporate payout, cash retention, and the supply of credit: Evidence from the 2008–2009 credit crisis. *Journal of Financial Economics*. **115**(3), pp.521–540.

Borghesi, R., Houston, J.F. and Naranjo, A. 2014. Corporate socially responsible investments: CEO altruism, reputation, and shareholder interests. *Journal of Corporate Finance*. **26**, pp.164–181.

Bowen, R.M., DuCharme, L. and Shores, D. 1995. Stakeholders' implicit claims and accounting method choice. *Journal of Accounting and Economics*. **20**(3), pp.255–295.

Brav, A., Graham, J.R., Harvey, C.R. and Michaely, R. 2005. Payout policy in the 21st century. *Journal of Financial Economics*. **77**(3), pp.483–527.

Burns, N. and Kedia, S. 2006. The impact of performance-based compensation on misreporting. *Journal of Financial Economics*. **79**(1), pp.35–67.

Bushee, B.J. 1998. The influence of institutional investors on myopic R&D investment behavior. *Accounting Review*. **73**(3), pp.305–333.

Cai, X., Gao, N., Garrett, I. and Xu, Y. 2020. Are CEOs judged on their companies' social reputation? *Journal of Corporate Finance*. **64**, p.101621.

Cain, M.D., McKeon, S.B. and Solomon, S.D. 2017. Do takeover laws matter? Evidence from five decades of hostile takeovers. *Journal of Financial Economics*. **124**(3), pp.464–485.

Callen, J.L. and Fang, X. 2015. Religion and stock price crash risk. *Journal of Financial and Quantitative Analysis*. **50**(1–2), pp.169–195.

Canina, L. and Figlewski, S. 1993. The informational content of implied volatility. *Review of Financial Studies*. **6**(3), pp.659–681.

Caskey, J. and Ozel, N.B. 2017. Earnings expectations and employee safety. *Journal of Accounting and Economics*. **63**(1), pp.121–141.

Chakravarthy, J., DeHaan, E. and Rajgopal, S. 2014. Reputation repair after a serious restatement. *Accounting Review*. **89**(4), pp.1329–1363.

Chang, C.-H., Chen, S.-S., Chen, Y.-S. and Peng, S.-C. 2019. Commitment to build trust by socially responsible firms: Evidence from cash holdings. *Journal of Corporate Finance*. **56**, pp.364–387.

Chava, S. and Purnanandam, A. 2010. CEOs versus CFOs: Incentives and corporate policies. *Journal of Financial Economics*. **97**(2), pp.263–278.

Chay, J.B. and Suh, J. 2009. Payout policy and cash-flow uncertainty. *Journal of Financial Economics*. **93**(1), pp.88–107.

Chen, H., Xu, Y. and Yang, J. 2021. Systematic risk, debt maturity, and the term structure of credit spreads. *Journal of Financial Economics*. **139**(3), pp.770–799.

Chen, J., Hong, H. and Stein, J.C. 2001. Forecasting crashes: trading volume, past returns, and conditional skewness in stock prices. *Journal of Financial Economics*. **61**(3), pp.345–381.

Chen, J., Leung, W.S. and Goergen, M. 2017. The impact of board gender composition on dividend payouts. *Journal of Corporate Finance*. **43**, pp.86–105.

Chen, J., Su, X., Tian, X. and Xu, B. 2022. Does customer-base structure influence managerial risk-taking incentives? *Journal of Financial Economics*. **143**(1), pp.462–483.

Chen, S.-S. and Wang, Y. 2012. Financial constraints and share repurchases. *Journal of Financial Economics*. **105**(2), pp.311–331.

Cheng, Y., Harford, J. and Zhang, T. (Tim) 2015. Bonus-Driven Repurchases. *Journal of Financial and Quantitative Analysis*. **50**(3), pp.447–475.

Choi, J., Hackbarth, D. and Zechner, J. 2021. Granularity of corporate debt. *Journal of Financial and Quantitative Analysis*. **56**(4), pp.1127–1162.

Cohen, S., Kadach, I., Ormazabal, G. and Reichelstein, S. 2023. Executive compensation tied to ESG performance: International evidence. *Journal of accounting research*. **61**(3), pp.805–853.

Cohn, J., Nestoriak, N. and Wardlaw, M. 2021. Private equity buyouts and workplace safety. *Review of Financial Studies*. **34**(10), pp.4832–4875.

Cohn, J.B. and Wardlaw, M.I. 2016. Financing constraints and workplace safety. *Journal of Finance*. **71**(5), pp.2017–2058.

Coles, J.L., Daniel, N.D. and Naveen, L. 2006. Managerial incentives and risk-taking. *Journal of Financial Economics*. **79**(2), pp.431–468.

Cook, M., Savage, K. and Barge, F. 2023. Linking executive pay to sustainability goals. *Harvard Business Review*.

Core, J. and Guay, W. 2002. Estimating the value of employee stock option portfolios and their sensitivities to price and volatility. *Journal of Accounting Research*. **40**(3), pp.613–630.

Cornell, B. and Shapiro, A.C. 1987. Corporate stakeholders and corporate finance. *Financial Management*. **16**(1), pp.5–14.

Custodio, C., Ferreir, M.A. and Matos, P. 2019. Do general managerial skills spur innovation? *Management Science*. **65**(2), pp.459–476.

Custódio, C., Ferreira, M.A. and Matos, P. 2013. Generalists versus specialists: Lifetime work experience and chief executive officer pay. *Journal of Financial Economics*. **108**(2), pp.471–492.

Dai, R., Liang, H. and Ng, L. 2021. Socially responsible corporate customers. *Journal of Financial Economics*. **142**(2), pp.598–626.

Daniel, N.D., Denis, D.J. and Naveen, L. 2010. Sources of financial flexibility: Evidence from cash flow shortfalls *In*: Drexel University.

Dechow, P.M. and Sloan, R.G. 1991. Executive incentives and the horizon problem: An empirical investigation. *Journal of Accounting and Economics*. **14**(1), pp.51–89.

Deloitte 2021. *Road to net zero* [Online]. Available from: https://ukpages.deloitte.com/rs/676-RGI-700/images/Road-to-net-zero-incentivising-leadership-2021.pdf.

Deng, X., Kang, J. and Low, B.S. 2013. Corporate social responsibility and stakeholder value maximization: Evidence from mergers. *Journal of Financial Economics*. **110**(1), pp.87–109.

Denis, D.J., Denis, D.K. and Sarin, A. 1994. The Information Content of Dividend Changes: Cash Flow Signaling, Overinvestment, and Dividend Clienteles. *Journal of Financial and Quantitative Analysis*. **29**(4), pp.567–587.

Derchi, G.-B., Zoni, L. and Dossi, A. 2020. Corporate social responsibility performance, incentives, and learning effects. *Journal of Business Ethics*.

Dichev, I.D. and Tang, V.W. 2009. Earnings volatility and earnings predictability. *Journal of Accounting and Economics*. **47**(1), pp.160–181.

DiMaggio, P.J. and Powell, W.W. 1983. The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American sociological review*. **48**(2), pp.147–160.

Dimson, E. 1979. Risk measurement when shares are subject to infrequent trading. *Journal of Financial Economics*. **7**(2), pp.197–226.

Dittmar, A.K. 2000. Why do firms repurchase stock. *Journal of Business*. **73**(3), pp.331–355.

Do, T., Zhang, H. and Zuo, L. 2022. Rocking the boat: How relative performance evaluation affects corporate risk taking. *Journal of Accounting and Economics*. **73**(1), p.101425.

Dunbar, C., Li, Z. and Shi, Y. 2020. CEO risk-taking incentives and corporate social responsibility. *Journal of Corporate Finance*. **64**, p.101714.

Easterbrook, F.H. 1984. Two agency-cost explanations of dividends. *American Economic Review*. **74**(4), pp.650–659.

Eccles, R.G., Ioannou, I. and Serafeim, G. 2014. The impact of corporate sustainability on organizational processes and performance. *Management Science*. **60**(11), pp.2835–2857.

Eccles, R.G. and Mavrinac, S.C. 1995. Improving the corporate disclosure process. *MIT Sloan Management Review*. **36**(4), p.11.

Edmans, A. 2012. The link between job satisfaction and firm value, with implications for corporate social responsibility. *Academy of Management Perspectives*. **26**(4), pp.1–19.

Edmans, A., Fang, V.W. and Huang, A.H. 2022. The long-term consequences of short-term incentives. *Journal of Accounting Research*. **60**(3), pp.1007–1046.

Faccio, M., Marchica, M.-T. and Mura, R. 2011. Large shareholder diversification and corporate risk-taking. *Review of Financial Studies*. **24**(11), pp.3601–3641.

Feng, M., Ge, W., Luo, S. and Shevlin, T. 2011. Why do CFOs become involved in material accounting manipulations? *Journal of Accounting and Economics*. **51**(1), pp.21–36.

Fenn, G.W. and Liang, N. 2001. Corporate payout policy and managerial stock incentives. *Journal of Financial Economics*. **60**(1), pp.45–72.

Flammer, C. 2018. Competing for government procurement contracts: The role of corporate social responsibility. *Strategic Management Journal*. **39**(5), pp.1299–1324.

Flammer, C. 2013. Corporate social responsibility and shareholder reaction: The environmental awareness of investors. *Academy of Management Journal*. **56**(3), pp.758–781.

Flammer, C., Hong, B. and Minor, D. 2019. Corporate governance and the rise of integrating corporate social responsibility criteria in executive compensation: Effectiveness and implications for firm outcomes. *Strategic Management Journal*. **40**(7), pp.1097–1122.

Freeman, R.E. 1984. *Strategic management : A stakeholder approach*. Boston [Mass.] ; Pitman.

Frynas, J.G. and Yamahaki, C. 2016. Corporate social responsibility: Review and roadmap of theoretical perspectives. *Business Ethics*. **25**(3), pp.258–285.

Fu, L., Boehe, D. and Orlitzky, M. 2020. Are R&D-intensive firms also corporate social responsibility specialists? A multicountry study. *Research Policy*. **49**(8), p.104082.

Fu, R., Tang, Y. and Chen, G. 2020. Chief sustainability officers and corporate social (Ir)responsibility. *Strategic Management Journal*. **41**(4), pp.656–680.

Gao, H., Li, K. and Ma, Y. 2021. Stakeholder orientation and the cost of debt: Evidence from state-level adoption of constituency statutes. *Journal of Financial and Quantitative Analysis*. **56**(6), pp.1908–1944.

Ghaly, M., Dang, V.A. and Stathopoulos, K. 2015. Cash holdings and employee welfare. *Journal of Corporate Finance*. **33**, pp.53–70.

Gibbons, R. and Murphy, K.J. 1992. Optimal incentive contracts in the presence of career concerns: Theory and evidence. *Journal of Political Economy*. **100**(3), pp.468–505.

Gillan, S.L., Koch, A. and Starks, L.T. 2021. Firms and social responsibility: A review of ESG and CSR research in corporate finance. *Journal of Corporate Finance*. **66**, p.101889.

Glover, J. and Xue, H. 2022. Accounting conservatism and relational contracting. *Journal of Accounting and Economics*., p.101571.

Godfrey, P.C. 2005. The relationship between corporate philanthropy and shareholder wealth: A risk management perspective. *Academy of Management Review*. **30**(4), pp.777–798.

Graham, J.R., Harvey, C.R. and Rajgopal, S. 2005. The economic implications of corporate financial reporting. *Journal of Accounting and Economics*. **40**(1), pp.3–73.

Grewal, J. and Serafeim, G. 2020. Research on corporate sustainability: Review and directions for future research. *Foundations and Trends in Accounting*. **14**(2), pp.73–127.

Grullon, G. and Michaely, R. 2004. The information content of share repurchase programs. *Journal of Finance*. **59**(2), pp.651–680.

Guay, W.R. 1999. The sensitivity of CEO wealth to equity risk: An analysis of the magnitude and determinants. *Journal of Financial Economics*. **53**(1), pp.43–71.

Guo, B., Pérez-Castrillo, D. and Toldrà-Simats, A. 2019. Firms' innovation strategy under the shadow of analyst coverage. *Journal of Financial Economics*. **131**(2), pp.456–483.

Hadlock, C.J. and Pierce, J.R. 2010. New evidence on measuring financial constraints: Moving beyond the KZ index. *Review of Financial Studies*. **23**(5), pp.1909–1940.

Han, S. and Qiu, J. 2007. Corporate precautionary cash holdings. *Journal of Corporate Finance*. **13**(1), pp.43–57.

Harford, J., Klasa, S. and Maxwell, W.F. 2014. Refinancing risk and cash holdings. *Journal of Finance*. **69**(3), pp.975–1012.

Hart, O.D. and Zingales, L. 2022. The new corporate governance.

Hart, S.L. 1995. A natural-resource-based view of the firm. *Academy of Management Review*. **20**(4), pp.986–1014.

Hasan, I., Hoi, C.-K. (Stan), Wu, Q. and Zhang, H. 2017. Does social capital matter in corporate decisions? Evidence from corporate tax avoidance. *Journal of Accounting Research*. **55**(3), pp.629–668.

He, J. (Jack) and Tian, X. 2013. The dark side of analyst coverage: The case of innovation. *Journal of Financial Economics*. **109**(3), pp.856–878.

He, Z. and Xiong, W.E.I. 2012. Rollover risk and credit risk. *Journal of Finance*. **67**(2), pp.391–430.

Healy, P.M. and Wahlen, J.M. 1999. A review of the earnings management literature and its implications for standard setting. *Accounting Horizons*. **13**(4), pp.365–383.

Hilary, G. and Hui, K.W. 2009. Does religion matter in corporate decision making in America? *Journal of Financial Economics*. **93**(3), pp.455–473.

Ho, S. 2023. More executives could see their compensation tied to ESG goals if SEC finalizes climate disclosure rules. Thomson Reuters.

Hodgson, C. 2023. The money behind the coming wave of climate litigation. *Financial Times*. [Online]. Available from: https://www.ft.com/content/055ef9f4-5fb7-4746-bebd-7bfa00b20c82.

Hoi, C.K., Wu, Q. and Zhang, H. 2019. Does social capital mitigate agency problems? Evidence from Chief Executive Officer (CEO) compensation. *Journal of Financial Economics*. **133**(2), pp.498–519.

Holder, M.E., Langrehr, F.W. and Hexter, J.L. 1998. Dividend policy determinants: An investigation of the influences of stakeholder theory. *Financial management*. **27**(3), pp.73–82.

Holmstrom, B. 1979. Moral hazard and observability. *Bell Journal of Economics*. **10**(1), pp.74–91.

Holmstrom, B. and Milgrom, P. 1991. Multitask principal-agent analyses: Incentive contracts, asset ownership, and job design. *Journal of Law, Economics, and Organization*. **7**(special), pp.24–52.

Hong, B. 2017. Paying for CSR is good governance. *Ivey Business Journal*.

Hong, B., Li, Z. and Minor, D. 2016. Corporate governance and executive compensation for corporate social responsibility. *Journal of Business Ethics*. **136**(1), pp.199–213.

Hovakimian, A. 2004. The role of target leverage in security issues and repurchases. *Journal of Business*. **77**(4), pp.1041–1072.

Hribar, P., Jenkins, N.T. and Johnson, W.B. 2006. Stock repurchases as an earnings management device. *Journal of Accounting and Economics*. **41**(1), pp.3–27.

Huang, K. and Shang, C. 2019. Leverage, debt maturity, and social capital. *Journal of Corporate Finance*. **54**, pp.26–46.

Hui, K.W., Klasa, S. and Yeung, P.E. 2012. Corporate suppliers and customers and accounting conservatism. *Journal of Accounting and Economics*. **53**(1), pp.115–135.

Hutton, A.P., Marcus, A.J. and Tehranian, H. 2009. Opaque financial reports, R2, and crash risk. *Journal of Financial Economics*. **94**(1), pp.67–86.

Hwang, B.-H. and Kim, S. 2009. It pays to have friends. *Journal of Financial Economics*. **93**(1), pp.138–158.

Ikenberry, D., Lakonishok, J. and Vermaelen, T. 1995. Market underreaction to open market share repurchases. *Journal of Financial Economics*. **39**(2), pp.181–208.

Ioannou, I., Li, S.X. and Serafeim, G. 2016. The effect of target difficulty on target completion: The case of reducing carbon emissions. *Accounting Review*. **91**(5), pp.1467–1492.

Ittner, C.D., Larcker, D.F. and Rajan, M. V 1997. The choice of performance measures in annual bonus contracts. *Accounting Review*. **72**(2), pp.231–255.

Jagannathan, M., Stephens, C.P. and Weisbach, M.S. 2000. Financial flexibility and the choice between dividends and stock repurchases. *Journal of Financial Economics*. **57**(3), pp.355–384.

Jensen, M.C. 1986. Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review*. **76**(2), pp.323–329.

Jensen, M.C. 2005. Agency costs of overvalued equity. *Financial Management*. **34**(1), pp.5–19.

Jensen, M.C. and Meckling, W.H. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*. **3**(4), pp.305–360.

Jensen, M.C. and Murphy, K.J. 1990. Performance pay and top-management incentives. *Journal of Political Economy*. **98**(2), pp.225–264.

Jin, L. and Myers, S.C. 2006. R2 around the world: New theory and new tests. *Journal of Financial Economics*. **79**(2), pp.257–292.

John, K., Knyazeva, A. and Knyazeva, D. 2011. Does geography matter? Firm location and corporate payout policy. *Journal of Financial Economics*. **101**(3), pp.533–551.

John, K., Litov, L. and Yeung, B. 2008. Corporate governance and risk-taking. *Journal of Finance*. **63**(4), pp.1679–1728.

Jung, B., Soderstrom, N. and Yang, Y.S. 2013. Earnings smoothing activities of firms to manage credit ratings. *Contemporary Accounting Research*. **30**(2), pp.645–676.

Kahle, K.M. 2002. When a buyback isn't a buyback: open market repurchases and employee options. *Journal of Financial Economics*. **63**(2), pp.235–261.

Kaplan, S.N. and Zingales, L. 1997. Do investment-cash flow sensitivities provide useful measures of financing constraints? *Quarterly Journal of Economics*. **112**(1), pp.169–215.

Karpoff, J.M., Scott Lee, D. and Martin, G.S. 2008. The consequences to managers for financial misrepresentation. *Journal of Financial Economics*. **88**(2), pp.193–215.

Karpoff, J.M. and Wittry, M.D. 2018. Institutional and legal context in natural experiments: The case of state antitakeover laws: Institutional and legal context in natural experiments. *Journal of Finance*. **73**(2), pp.657–714.

Kasznik, R. and Lev, B. 1995. To warn or not to warn: Management disclosures in the face of an earnings surprise. *Accounting Review*. **70**(1), pp.113–134.

Kelly, B., Pástor, L. and Veronesi, P. 2016. The price of political uncertainty: Theory and evidence from the option market. *Journal of Finance*. **71**(5), pp.2417–2480.

Khurana, I.K., Pereira, R. and Zhang, E. (Xia) 2018. Is real earnings smoothing harmful? Evidence from firm-specific stock price crash risk. *Contemporary Accounting Research*. **35**(1), pp.558–587.

Kim, C. (Francis), Wang, K. and Zhang, L. 2019. Readability of 10-K reports and stock price crash risk. *Contemporary Accounting Research*. **36**(2), pp.1184–1216.

Kim, J.-B., Li, Y. and Zhang, L. 2011a. CFOs versus CEOs: Equity incentives and crashes. *Journal of Financial Economics*. **101**(3), pp.713–730.

Kim, J.-B., Li, Y. and Zhang, L. 2011b. Corporate tax avoidance and stock price crash risk: Firm-level analysis. *Journal of Financial Economics*. **100**(3), pp.639–662.

Kim, J.-B., Wang, Z. and Zhang, L. 2016. CEO overconfidence and stock price crash risk. *Contemporary Accounting Research*. **33**(4), pp.1720–1749.

Kim, J.-B. and Zhang, L. 2016. Accounting conservatism and stock price crash risk: Firm-level evidence. *Contemporary Accounting Research*. **33**(1), pp.412–441.

Kim, O. 1999. Discussion of the role of the manager's human capital in discretionary disclosure. *Journal of Accounting Research*. **37**(SUPP), pp.183–185.

Kothari, S.P., Laguerre, T.E. and Leone, A.J. 2002. Capitalization versus expensing: Evidence on the uncertainty of future earnings from capital expenditures versus R&D outlays. *Review of Accounting Studies*. **7**(4), pp.355–382.

Kothari, S.P., Shu, S. and Wysocki, P.D. 2009. Do managers withhold bad news? *Journal of Accounting Research*. **47**(1), pp.241–276.

Kruger, P. 2015. Corporate goodness and shareholder wealth. *Journal of Financial Economics*. **115**(2), pp.304–329.

LaFond, R. and Watts, R.L. 2008. The information role of conservatism. *Accounting Review*. **83**(2), pp.447–478.

Li, D. 2011. Financial constraints, R&D investment, and stock returns. *Review of Financial Studies*. **24**(9), pp.2974–3007.

Li, K., Griffin, D., Yue, H. and Zhao, L. 2013. How does culture influence corporate risk-taking? *Journal of Corporate Finance*. **23**, pp.1–22.

Li, S. and Zhan, X. 2019. Product market threats and stock crash risk. *Management Science*. **65**(9), pp.4011–4031.

Li, X., Low, A. and Makhija, A.K. 2017. Career concerns and the busy life of the young CEO. *Journal of Corporate Finance*. **47**, pp.88–109.

Lins, K. V, Servaes, H. and Tamayo, A. 2017. Social capital, trust, and firm performance: The value of corporate social responsibility during the financial crisis. *Journal of Finance*. **72**(4), pp.1785–1824.

Liu, C., Masulis, R.W. and Stanfield, J. 2021. Why CEO option compensation can be a bad option for shareholders: Evidence from major customer relationships. *Journal of Financial Economics*. **142**(1), pp.453–481.

Liu, Z., Shen, H., Welker, M., Zhang, N. and Zhao, Y. 2021. Gone with the wind: An externality of earnings pressure. *Journal of Accounting and Economics*. **72**(1), p.101403.

Ljungqvist, A., Zhang, L. and Zuo, L. 2017. Sharing risk with the government: How taxes affect corporate risk taking. *Journal of Accounting Research*. **55**(3), pp.669–707.

Al Mamun, M., Balachandran, B. and Duong, H.N. 2020. Powerful CEOs and stock price crash risk. *Journal of Corporate Finance*. **62**, p.101582.

Masulis, R.W. and Reza, S.W. 2015. Agency problems of corporate philanthropy. *Review of Financial Studies*. **28**(2), pp.592–636.

Matsumoto, D.A. 2002. Management's incentives to avoid negative earnings surprises. *Accounting Review*. **77**(3), pp.483–514.

McWilliams, A. and Siegel, D. 2001. Corporate social responsibility: A theory of the firm perspective. *Academy of Management Review*. **26**(1), pp.117–127.

McWilliams, A. and Siegel, D. 2000. Corporate social responsibility and financial performance: Correlation or misspecification? *Strategic Management Journal*. **21**(5), pp.603–609.

Meyer, J.W. and Rowan, B. 1977. Institutionalized organizations: formal structure as myth and ceremony. *American journal of sociology*. **83**(2), pp.340–363.

Miller, M.H. and Modigliani, F. 1961. Dividend policy, growth, and the valuation of shares. *Journal of Business*. **34**(4), pp.411–433.

Modigliani, F. and Miller, M.H. 1958. The cost of capital, corporation finance and the theory of investment. *American Economic Review*. **48**(3), pp.261–297.

Myers, S.C. 1984. The capital structure puzzle. *Journal of Finance*. **39**(3), pp.574–592.

Nagar, V. 1999. The role of the manager's human capital in discretionary disclosure. *Journal of Accounting Research*. **37**(SUPP), pp.167–181.

O'Connor, P., Harris, L. and Gosling, T. 2021. Linking executive pay to ESG goals. *PwC*. [Online]. Available from: https://www.pwc.com/gx/en/issues/reinventing-the-future/take-on-tomorrow/download/Linking-exec-pay-ESG.pdf.

Opler, T.C. and Titman, S. 1994. Financial distress and corporate performance. *Journal of Finance*. **49**(3), pp.1015–1040.

Pfeffer, J. 1992. Understanding power in organizations. *California Management Review*. **34**(2), pp.29–50.

Prendergast, C. and Stole, L. 1996. Impetuous youngsters and jaded old-timers: Acquiring a reputation for learning. *Journal of Political Economy*. **104**(6), pp.1105–1134.

Qin, B. and Yang, L. 2022. CSR contracting and performance-induced CEO turnover. *Journal of Corporate Finance*. **73**, p.102173.

Rountree, B., Weston, J.P. and Allayannis, G. 2008. Do investors value smooth performance? *Journal of Financial Economics*. **90**(3), pp.237–251.

Roychowdhury, S. 2006. Earnings management through real activities manipulation. *Journal of Accounting and Economics*. **42**(3), pp.335–370.

Rupasingha, A., Goetz, S.J. and Freshwater, D. 2006. The production of social capital in US counties. *Journal of Socio-Economics*. **35**(1), pp.83–101.

Russo, M. V and Fouts, P.A. 1997. A resource-based perspective on corporate environmental performance and profitability. *Academy of Management Journal*. **40**(3), pp.534–559.

Samuels, D. 2021. Government procurement and changes in firm transparency. *Accounting Review*. **96**(1), pp.401–430.

Serfling, M.A. 2014. CEO age and the riskiness of corporate policies. *Journal of Corporate Finance*. **25**, pp.251–273.

Shleifer, A. and Vishny, R.W. 1997. A survey of corporate governance. *Journal of Finance*. **52**(2), pp.737–783.

Simon, F.L. 1992. Marketing green products in the triad. *Journal of World Business*. **27**(3,4), p.268.

Skinner, D.J. 1997. Earnings disclosures and stockholder lawsuits. *Journal of Accounting and Economics*. **23**(3), pp.249–282.

Skinner, D.J. 2008. The evolving relation between earnings, dividends, and stock repurchases. *Journal of Financial Economics*. **87**(3), pp.582–609.

Skinner, D.J. 1994. Why firms voluntarily disclose bad news. *Journal of Accounting Research*. **32**(1), pp.38–60.

Skinner, D.J. and Sloan, R.G. 2002. Earnings surprises, growth expectations, and stock returns or don't let an earnings torpedo sink your portfolio. *Review of Accounting Studies*. **7**(2–3), p.289.

Stein, J.C. 1989. Efficient capital markets, inefficient firms: A model of myopic corporate behavior. *Quarterly Journal of Economics*. **104**(4), pp.655–669.

Stein, J.C. and Hong, H. 1999. Differences of opinion, rational arbitrage and market crashes.

Stephens, C.P. and Weisbach, M.S. 1998. Actual share reacquisitions in open-market repurchase programs. *Journal of Finance*. **53**(1), pp.313–333.

Stock, J. and Yogo, M. 2005. Testing for weak instruments in linear IV regression D. W. K. Andrews, ed. *Identification and Inference for Econometric Models*., pp.80–108.

Strobl, G. 2013. Earnings manipulation and the cost of capital. *Journal of Accounting Research*. **51**(2), pp.449–473.

Titman, S. and Wessels, R. 1988. The Determinants of capital structure choice. *Journal of Finance*. **43**(1), pp.1–19.

Trueman, B. and Titman, S. 1988. An explanation for accounting income smoothing. *Journal of Accounting Research*. **26**(2), pp.127–139.

Tsang, A., Wang, K.T., Liu, S. and Yu, L. 2021. Integrating corporate social responsibility criteria into executive compensation and firm innovation: International evidence. *Journal of Corporate Finance*. **70**, p.102070.

Vermaelen, T. 1981. Common stock repurchases and market signalling: An empirical study. *Journal of Financial Economics*. **9**(2), pp.139–183.

Waddock, S.A. and Graves, S.B. 1997. The corporate social performance-financial performance link. *Strategic Management Journal*. **18**(4), pp.303–319.

Wang, J. and Dewhirst, H.D. 1992. Boards of directors and stakeholder orientation. *Journal of Business Ethics*. **11**(2), pp.115–123.

Wang, Z., Yin, Q.E. and Yu, L. 2021. Real effects of share repurchases legalization on corporate behaviors. *Journal of Financial Economics*. **140**(1), pp.197–219.

WCED 1987. *Our common future* [Online]. Available from: https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf.

Xu, Q. and Kim, T. 2022. Financial constraints and corporate environmental policies. *Review of Financial Studies*. **35**(2), pp.576–635.

Xuefeng Jiang, J., Petroni, K.R. and Yanyan Wang, I. 2010. CFOs and CEOs: Who have the most influence on earnings management? *Journal of Financial Economics*. **96**(3).