Essays on CEO characteristics and firm behaviour in China

A thesis presented in fulfilment of the requirement for the degree of

Doctor of Philosophy in Finance

at Massey University, Manawatu campus, New Zealand

Xutang Liu

2023

ABSTRACT

This thesis consists of three essays. Essay one investigates the effect of chief executive officer (CEO) pay disparity on firm performance using a large sample of Chinese listed firms from 2005 to 2018. It is found that CEO pay disparity is associated with better firm performance. This result supports the rank-order tournament theory that a large pay disparity between the CEO and non-CEO top executives provides non-CEO top executives with strong tournament incentives to work harder for promotion of the next CEO. Further analysis indicates that CEO political connection and CEO tenure significantly weaken the effectiveness of tournament incentives because politically connected CEOs and CEOs with long tenures are more powerful and tend to entrench themselves. Moreover, the positive promotion-based tournament effects are reduced by female and older non-CEO top executives since they are less sensitive to tournament incentives. In addition, we examine the effectiveness of the 2015 "pay ceiling" regulation and find that this regulation significantly reduces CEO pay disparity and the positive tournament effect on firm performance in state-owned enterprises (SOEs). Our results suggest that CEO pay disparity can be used an effective corporate governance mechanism in improving firm performance and policy-makers should thoroughly consider potential side effects when limiting top executives' compensation.

The second essay examines the influence of CEO early-life experience on accounting conservatism. Using China's Cultural Revolution (1966–1976) as a shock to risk attitude, this study finds that CEOs who experienced the Cultural Revolution in their early life are more conservative and risk-averse, thus leading to a higher level of accounting conservatism. We further document that political influence can moderate such positive association. In particular, the Cultural Revolution effect is more pronounced in regions with higher political risks and in

SOEs. Additional analysis suggests that CEOs with early-life Cultural Revolution experience tend to increase firm's provisions for liabilities and decrease accrual-based earnings management, indicating the risk-averse attitude of such CEOs. Our findings add new evidence to support the upper echelons theory and the imprinting theory by highlighting the important role of CEOs' early-life traumatic experience in affecting firm financial reporting behaviour.

In the third essay, we also focus on CEOs' early-life Cultural Revolution experience and study its impact on stock price crash risk. We find that CEOs with early-life Cultural Revolution experience are negatively and significantly associated with stock price crash risk. This finding indicates that CEOs who experienced the Cultural Revolution in their early life are more risk-averse and less likely to hoard bad news. Further analysis indicates that such a negative association is more salient in firms with higher litigation risk, e.g., when firms are subjected to major lawsuits, in high-litigation risk industries, and in provinces with better legal development. In addition, the channel analysis suggests that CEOs with early-life Cultural Revolution experience tend to reduce corporate earnings management and tax avoidance, explaining the negative effect of CEO early-life experience on crash risk. These findings also support the upper echelons theory and the imprinting theory. Overall, this thesis documents the essential role of CEO characteristics on managerial decision-making and firm behaviours.

ACKNOWLEDGEMENT

First and foremost, I would like to express my deepest gratitude to Professor Martin Young and Associated Professor Jing Liao, my supervisors, for their exceptional guidance, support, and encouragement throughout my doctoral journey. Their expertise, advice, and mentorship have been invaluable in shaping my research and helping me navigate the challenges of the thesis. It is a great privilege and honour for me to work and study under their guidance. To Martin, thank you for your encouragement, patience, and valuable suggestions. Your immense knowledge, sincerity, and motivation have deeply inspired me. To Jing, you started being my supervisor since my Master study. You guided me into the research with your extraordinary knowledge, research enthusiasm, and continuous encouragement. Your unwavering support and constructive suggestions have been critical in helping me develop my research and expand my knowledge and skills. I am truly grateful for your contributions to my academic and personal growth.

I would like to acknowledge Associated Professor Jing Chi for academic and life advice, Mark Woods and Jana Blahova for technical support, Fong Mee Chin and Maryke Bublitz for administrative support. I am also grateful to everyone in the School of Economics and Finance for their various forms of support during my PhD study.

I wish to extend my appreciation to discussants and participants of the 2022 International Society for the Advancement of Financial Economics (ISAFE) conference for their valuable comments and suggestions. Their feedback definitely has positive effect on the overall quality of this thesis.

Many thanks to my PhD mates and friends who have made my PhD journey memorable. Your invaluable friendship and support are deeply appreciated. Special thanks to Bilal Hafeez

and Lu Wang. I have benefited greatly from discussing and sharing research with them often during my PhD study. Special thanks to Assistant Professor Shouyu Yao of Tianjin University who is a mentor and a friend to me. His enthusiasm for research has inspired me deeply and I am very grateful for his useful and practical academic and life advice.

Finally, I would like to express my great gratitude to my family. I want to thank my parents, Zixing Liu and Yuling Sun, and my older sister Lu Liu for their wise counsel and sympathetic ear. Their unconditional love and support keep me motivated and confident. This journey would not have been possible without their support and encouragement.

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CHAPTER ONE INTRODUCTION

1.1. Motivation and objectives

The top executives are responsible for a firm's day-to-day operations and profitability. Upper echelons theory suggests that the characteristics of top executives (especially CEOs) have a significant influence on corporate strategic decision-making and overall performance of a company (Hambrick and Mason, 1984; Hambrick, 2007). Accordingly, CEO characteristics and the role of the CEO in corporate decisions have received considerable attention and drawn significant research interest (e.g., Farrell and Whidbee, 2003; Carpenter et al., 2004; Kaplan et al., 2012; Faccio et al., 2016; Bernile et al., 2017). The three essays in this thesis focus on CEO pay disparity and CEO early-life experience to enrich this stream of research.

The disparity between the CEO's and non-CEO executives' compensation plays an important role in the inner workings of the top executive team (Bebchuk et al, 2011). On the one hand, a large CEO pay disparity fosters tournament incentives that motivate other top executives to exert increased effort, which promotes firm performance (Lazear and Rosen, 1981; Kale et al., 2009). On the other hand, a large pay difference between the CEO and other top executives may reflect an entrenched and powerful CEO, which can lead to more agency problems and worse corporate performance (Bebchuk et al, 2011). The Chinese government has implemented a series of regulations to limit executive compensation, especially CEOs and chairmen, to alleviate strong social discontent with pay inequality (Bai et al., 2019). In addition, Chinese traditional culture such as Confucian culture prefers collectivism, while Western cultures tend to emphasize individualism (Jin et al., 2023). The cultural influence will also matter to the CEO pay disparity effect, while there is still lack of evidence from China' setting.

Therefore, the first essay of this thesis investigates the effect of CEO pay disparity on firm performance in China.

CEOs' various experiences shape their cognition and values, thereby greatly influencing managerial decisions and firm behaviours (Hambrick and Mason, 1984; Hambrick, 2007; Chin et al., 2013; Crossland et al., 2014; O'Sullivan et al., 2021; Tian et al., 2023). Scholars recently focus on CEOs' early-life experiences which can have a profound effect on their decision-making and leadership style, and this is particularly true for CEOs who grew up during extreme events. Imprinting theory indicates that exposure to traumatic events during individuals' early-life has a long-lasting effect on their risk attitudes and personality traits (Marquis and Tilcsik, 2013). Thus, early-life traumatic experiences can generate long-term imprints that affect CEOs' future risk preferences and decision-making (Bernile et al., 2017; Chen et al., 2021; Tian et al., 2023). Using China's Cultural Revolution (1966–1976) as a shock to risk attitude, essay two and essay three examine the influence of CEO early-life experience on corporate accounting conservatism and stock price crash risk, respectively.

1.2. Essay one

Essay one explores the effect of CEO pay disparity on firm performance. CEO pay disparity is defined as the pay difference between the CEO and non-CEO top executives. Using a large sample of 3,316 Chinese A-share firms listed on the Shanghai and Shenzhen Stock Exchanges from 2005 to 2018, this essay finds that CEO pay disparity is associated with increased firm performance. This finding indicates that a large pay difference between the CEO and non-CEO top executives provides non-CEO top executives with great tournament incentives to work harder for promotion to the next CEO, thereby enhancing firm performance. The result remains robust after various endogeneity checks, including a propensity score matching (PSM) analysis, a Heckman two-stage model, and an instrumental variable (IV) approach. This essay further examines the moderating effects of the characteristics of CEOs

and non-CEO top executives on the positive association between CEO pay disparity and firm performance. It is found that the promotion-based tournament incentives are less effective in firms managed by CEOs with political connections and longer tenures who are more powerful and tend to entrench themselves. Moreover, the positive tournament effect is reduced in firms with more female and older non-CEO top executives since they are less sensitive to tournament incentives. In addition, this essay investigates the effectiveness of the 2015 "pay ceiling" regulation issued by the central government for limiting executive pay in SOEs. It is found that this regulation significantly reduces CEO disparity and weakens the positive association between CEO pay disparity and firm performance in SOEs.

Essay one first contributes to the literature on the impact of CEO pay disparity. The findings support the rank-order tournament theory and suggest that CEO pay disparity can be used as an effective corporate governance mechanism in improving firm performance in Chinese listed firms. Second, most of the previous studies focus on how CEOs' characteristics affect the tournament incentives for non-CEO executives (Kale et al., 2009; Hu et al., 2013; Jia, 2018; Ghosh et al., 2023). This essay finds that female and older non-CEO executives are less sensitive to rank-order tournament incentives. Third, this essay may be the first to investigate the influence of the 2015 "pay ceiling" regulation on CEO pay disparity and firm performance. It is found that this executive pay ceiling regulation significantly reduces CEO pay disparity and the positive tournament effects on firm performance in SOEs.

1.3. Essay two

Essay two investigates CEOs' early-life experience and its effect on corporate accounting conservatism. Using China's Cultural Revolution[1] (1966–1976) as a shock to risk attitude, this essay documents that CEOs who experienced China's Cultural Revolution in their early life

[1] China's Cultural Revolution was a political and social upheaval full of instability and uncertainty that greatly affected people.

tend to be more risk-averse and conservative, thereby leading to a higher level of accounting conservatism. This result still holds after endogeneity checks, including a multiple fixed effects model, a PSM analysis, placebo tests, and a difference-in-difference (DiD) approach. Further, this essay studies the moderating effects of political influence on the documented positive association and finds that such a positive relation is more salient in environments with stronger political risks, e.g., in regions where the provincial leadership changes, and where high-profile corruption cases occur. Moreover, the positive effect of CEOs' early-life Cultural Revolution experience on accounting conservatism is stronger in SOEs in which managers' political career concerns are more pronounced. In addition, this essay shows that CEOs with early-life Cultural Revolution experience are more likely to increase firm's provisions for liabilities and decrease accrual-based earnings management.

Essay two makes the following contributions to the literature. First, this essay adds evidence to the literature that studies the influence of CEOs' early-life traumatic experiences on corporate decisions. Prior studies find that CEOs' personal traumatic experiences such as war experience (Malmendier et al., 2011; Choi and Jung, 2021), famine experience (Zhang, 2017; Feng and Johansson, 2018; Tian et al., 2023), and disaster experience (Bernile et al., 2017; Chen et al., 2021) significantly affect their risk attitude and managerial decisions. However, the debate on whether early-life traumatic experiences would make CEOs more risk-averse or risk-taking is still ongoing. Based on the upper echelons theory and the imprinting theory, this study documents that CEOs who experienced China's Cultural Revolution in their early life are more risk-averse and conservative, and thereby are associated with a higher level of accounting conservatism. This essay's empirical results provide evidence to this debate. Furthermore, this essay finds that the positive relation between CEO's early-life Cultural Revolution experience and accounting conservatism is more salient in an environment with stronger political influence, indicating the important role of political influence in China.

Second, this essay contributes to the literature in the field of research on accounting conservatism. Existing research has mainly shown that accounting conservatism can be affected by firm-level factors (Watts, 2003; Lara et al., 2009), executives' demographic characteristics (Ho et al., 2015), and external factors such as contracting, shareholder litigation, taxation, and accounting regulation (Watts, 2003; Bushman and Piotroski, 2006). While there are limited studies on the association between CEOs' early-life traumatic experiences and accounting conservatism. This essay contributes to the view that accounting conservatism can be influenced by the early-life traumatic experiences of CEOs.

1.4. Essay three

Essay three uses a large sample of Chinese listed firms that contains 29,115 firm-year observations from 2003 to 2021 and finds that CEOs' early-life experience of China's Cultural Revolution is negatively associated with stock price crash risk. This result indicates that CEOs who experienced the Cultural Revolution in their early life are more risk-averse and less willing to accept the risks associated with bad news hoarding. The robustness of this result is checked by adopting multiple approaches such as a multiple fixed effects model, a PSM analysis, a DiD approach, and placebo tests. This essay further shows that the documented negative association is more pronounced in firms with higher litigation risk, e.g., when firms are facing major lawsuits, operating in high-litigation risk industries, and are headquartered in provinces with better legal development. These results suggest that litigation risk moderates the negative association between CEOs' early-life experience and stock price crash risk. In addition, the channel analysis documents that CEOs who experienced the Cultural Revolution in early life are less likely to engage in risky behaviours such as earnings manipulation and tax avoidance, which explains the mitigating effect of CEOs' early-life Cultural Revolution experience on stock price crash risk.

Essay three makes the following contributions to the literature. First, this essay enriches the literature that studies the influence of CEOs' early-life traumatic experiences on managerial risk preference and firm behaviour by documenting a negative association between CEOs' early-life Cultural Revolution experience and stock price crash risk. Prior studies have come to inconsistent conclusions on whether CEOs who have traumatic early-life experiences would become more risk-averse or risk-taking. On the one hand, traumatic early-life experiences may help CEOs to better deal with risky situations, thus leading to more risk-taking firm behaviours such as aggressive financing and investment policies (Bernile et al., 2017) and more risky research and development (R&D) investment (Gao et al., 2021). On the other hand, CEOs who experienced adverse events in early life would be more sensitive to potential risks, and thus they tend to make more risk-averse decisions such as conservative corporate policies (Feng and Johansson, 2018) and better firm information transparency (Choi and Jung, 2021). Based on the upper echelons theory and the imprinting theory, this essay provides evidence to this ongoing debate. Second, this study contributes to the vast literature on the influencing factors of stock price crash risk such as accounting information characteristics (Hutton et al., 2009; Kim and Zhang, 2014), institutional investors (An and Zhang, 2013), managerial demographic characteristics (Andreou et al., 2017; Li and Zeng, 2019), auditor (Callen and Fang, 2017), corporate tax avoidance (Kim et al., 2011a), and so on. Within this literature, few studies explore the role of CEOs' early-life traumatic experiences. This essay studies the influence of CEOs' early-life Cultural Revolution experience on stock price crash risk, which expands the studies on the determinants of stock price crash risk.

1.5. Research output

Essay two has been presented at:

- 2022 International Society for the Advancement of Financial Economics (ISAFE) conference via zoom

1.6. Structure of the thesis

The structure of the thesis is organized as follows. Chapter 2 presents the first essay, which investigates the effect of CEO pay disparity on firm performance in China. Chapter 3 presents the second essay, which examines the influence of CEOs' early-life experience of China's Cultural Revolution on corporate accounting conservatism. The third essay that studies the effect of CEOs' early-life Cultural Revolution experience on stock price crash risk is presented in Chapter 4. Chapter 5 concludes the thesis by outlining the main findings and implications of each of the three essays and discusses the limitations of the thesis and future research.

CHAPTER TWO ESSAY ONE

CEO pay disparity and firm performance: New evidence from China

Abstract

This study investigates the influence of CEO pay disparity on firm performance. Using a large sample of Chinese listed firms, we find that CEO pay disparity is associated with significantly higher firm performance. This finding is consistent with the rank-order tournament theory which suggests that a large CEO pay disparity provides strong tournament incentives for non-CEO top executives to make great efforts, thereby increasing the likelihood of promotion to the next CEO. The result remains robust after addressing potential endogeneity concerns by employing a PSM analysis, a Heckman two-stage model, and an IV approach. Further analysis indicates that the characteristics of CEOs and non-CEO top executives moderate the positive relation between CEO pay disparity and firm performance. Specifically, politically connected CEOs and CEOs with longer tenures significantly weaken the positive tournament effects. Moreover, the effectiveness of tournament incentives is reduced when firms have more female and older non-CEO top executives. In addition, the 2015 "pay ceiling" regulation significantly reduces CEO pay disparity and weakens its positive effect on firm performance in SOEs. Overall, the results highlight the important role of tournament incentives in improving firm performance.

Keywords: CEO pay disparity; Firm performance; Tournament incentives; 2015 "pay ceiling" regulation; China

2.1. Introduction

In recent years, CEO pay disparity has attracted wide attention as a research topic of interest in the field of corporate governance (Kale et al., 2009; Bebchuk et al., 2011; Kini and Williams, 2012; Chen et al., 2013; Haß et al., 2015; Park, 2017; Shen and Zhang, 2018; Sun et al., 2019; Vo and Canil, 2019; Rouen, 2020; Zhang et al., 2022a; Chowdhury and Rahman, 2023; Ghosh et al., 2023). The top management team of a firm is responsible for the day-to-day operations and profitability, and executive work requires a high degree of task interdependence (Siegel and Hambrick, 2005). As the key to the corporate remuneration structure, the pay disparity between the CEO and other top executives plays an important role in the inner workings of the top management team (Bebchuk et al., 2011). Therefore, CEO pay disparity is essential to incentivise senior executives to strive for success and improve firm outcomes.

In this study, we investigate the relationship between CEO pay disparity and firm performance using data from Chinese listed firms. According to the rank-order tournament theory, a larger CEO pay disparity is beneficial to firm performance because it provides non-CEO top executives with tournament incentives to work harder for promotion to the next CEO (Lazear and Rosen, 1981). Therefore, a wide pay disparity helps to build a large pool of skilled internal candidates to be selected from for the CEO position (Chen et al., 2013). However, the managerial power theory, proposed by Bebchuk et al. (2011), argues that a large CEO pay disparity harms firm performance since it reflects the relative power and dominance of the CEO within the top management team (Bebchuk et al., 2011; Chen et al., 2013; Choe et al., 2014; Chun, 2019; Shahab et al., 2020). That is, a large CEO pay disparity indicates an entrenched CEO (Bebchuk et al., 2011; Chen et al., 2013). Therefore, it is important to investigate whether and how CEO pay disparity can serve as a governance mechanism to improve firm outcomes.

China, as the world's largest emerging market, provides an interesting setting to examine the effect of CEO pay disparity due to its unique institutional mechanisms. It is argued that China's corporate governance system is less efficient and the country's minority investor protection is insufficient (Firth et al., 2006; Hu et al., 2013). Stakeholders of publicly listed firms may believe that internal monitoring mechanisms, such as managerial compensation, are more effective in ensuring better firm performance than external mechanisms (Firth et al., 2006; Murphy, 1999). In addition, the widening pay gap between senior executives and regular employees has attracted substantial public attention and caused significant controversy in society since the disclosure of the individual compensation of senior executives was made compulsory in 2005. The Chinese central government implemented a regulation to limit executive salaries for the country's centrally-controlled state-owned enterprises (CSOEs) in 2009; however, this regulation did not prove to be very effective.[2] In 2014, a stricter "pay ceiling" regulation was announced to further limit the compensation of top executives in CSOEs. This regulation was officially implemented on 1 January 2015, and gradually implemented for SOEs owned by the local governments (LSOEs). The 2015 "pay ceiling" regulation has had a significant effect, with the level of compensation of CEOs in SOEs falling significantly after its implementation (Bai et al., 2019). Therefore, CEO pay disparity is expected to play a critical role in firm performance in China's listed firms.

In addition, according to the upper echelons theory (Hambrick and Mason, 1984), the characteristics of a top executive team drive their strategic choices and impact firm outcomes, thus they may affect the role of CEO pay disparity in firm performance. Existing literature finds that the characteristics of top executives can moderate the relationship between CEO pay disparity and firm outcomes. For example, the effectiveness of tournament incentive for non-

[2] State-owned enterprises (SOEs) in China are either controlled by the central government (CSOEs) or local governments (LSOEs). The central government directly controls and manages strategic SOEs through the State Assets Supervision and Administration Commission (SASAC).

CEO top executives is affected by entrenched CEOs because that may be less concerned about the threat of dismissal (Ghosh et al., 2023). Especially, politically connected CEOs tend to entrench themselves and face a lower replacement probability (Cao et al., 2012), which can mitigate the tournament incentive (Hu et al., 2013). Also, CEO-chair duality and CEO tenure are proxies for CEO entrenchment which may affect tournament effect (Ghosh et al., 2023). Moreover, the tournament incentive is stronger when the CEO is close to retirement and is weaker when the CEO is newly appointed (Kale et al., 2009; Gad et al., 2023; Ghosh et al., 2023). In terms of the non-CEO executives' characteristics, Talavera et al. (2021) document that non-CEO executives' age diversity has significant impact on tournament incentives. In particular, the tournament effect is decreased when non-CEO executives are from different age cohorts but is enhanced when non-CEO executives are from the same age cohort. Overall, top executives' engagement in tournaments for promotion is impacted by their perceived probability of success (Gad et al., 2023), and this is largely affected by the characteristics of top executives. Therefore, top executives' personal characteristics such as age, gender, tenure, and political connection will also be investigated in this study.

Using a large sample of 3,316 Chinese A-share firms listed on the Shanghai and Shenzhen Stock Exchanges from 2005 to 2018, this study finds that CEO pay disparity enhances firm performance significantly. Our finding suggests that a large pay difference between the CEO and non-CEO executives provides strong tournament incentives for non-CEO executives to perform well in order to pursue future promotion to CEO, thereby increasing firm performance. We adopt multiple approaches to justify the causal relationship between CEO pay disparity and firm performance, including a PSM analysis, a Heckman two-stage model, and the IV approach. The baseline results remain robust after addressing potential endogeneity problems.

We further find that promotion-based tournament incentives are less efficient in firms managed by politically connected CEOs and CEOs with longer tenures because they are more

powerful and more likely to entrench themselves. Moreover, the positive tournament effects tend to be reduced in firms with a higher ratio of female non-CEO executives and an older non-CEO executive team. These results indicate that the characteristics of CEOs and non-CEO executives can moderate the positive effect of CEO pay disparity on firm performance. In addition, we investigate the effectiveness of the 2015 "pay ceiling" regulation and find that this regulation significantly reduces CEO pay disparity and weakens the positive association between CEO pay disparity and firm performance in SOEs.

This study makes several contributions to the literature. First, we add evidence on the influence of CEO pay disparity on firm performance. Existing studies have examined the relation between CEO pay disparity and corporate performance; however, controversy remains in this line of research. Most of the existing studies in this area such as Kale et al. (2009), Bebchuk et al. (2011), and Chen et al. (2013) are conducted utilising data from Western industrialised societies. It may not be appropriate to draw general conclusions about the role of CEO pay disparity without evidence from emerging economies. For example, extremely high compensation and a widened pay gap have caused significant controversy in society and received widespread attention from policy-makers in China. In addition, Confucian culture, which is a central part of traditional Chinese culture, is different from Western elitist culture. Confucian culture emphasises fairness and collectivism, while power is celebrated in an elitist culture. In this study, we document that CEO pay disparity measured by both the CEO pay gap (Kale et al., 2009) and the CEO pay slice (CPS) (Bebchuk et al., 2011) is positively associated with firm performance in China's listed firms. This finding is in line with the rank-order tournament theory suggesting that a larger CEO pay gap provides greater tournament incentives for non-CEO executives to work harder for increased chances of promotion to the CEO position (Lazear and Rosen, 1981; Kale et al., 2009). However, the positive relationship between CPS and firm performance in China is not consistent with managerial power theory

which argues that a higher CPS reflects more CEO power, leading to more agency problems and decreased firm performance (Finkelstein, 1992; Bebchuk et al., 2011). The results of this study suggest that a higher CPS in China reflects positive tournament effects, which supports the rank-order tournament theory.

Second, this study examines the characteristics of non-CEO executives to explore their sensitivity to tournament incentives. Previous literature mainly focuses on how CEOs' characteristics impact the tournament incentives for other top executives. Few studies investigate whether tournament incentives are moderated by non-CEO executives' characteristics. This study analyses the effectiveness of tournament effects based on non-CEO executives' personal characteristics and provides more robust evidence supporting the positive influence of CEO pay disparity on firm performance. Specifically, we examine whether the efficiency of tournament incentives is shaped by non-CEO executives' gender and age. We find that the effectiveness of tournament incentives is weaker in firms with more female and older non-CEO executives. Since female CEOs are rare in Chinese listed firms, female non-CEO executives tend to be less sensitive to tournament incentives because they have much lower chances of being promoted to the CEO position. Also, female top executives are generally less risk-taking than male peers, thus they may have less willingness to adopt tournament incentives. We argue that the sensitivity of female executives to tournament incentives calls for further research. In addition, older non-CEO executives are less ambitious and more conservative; thus, they are less likely to be motivated by tournament incentives. This study emphasises the importance of non-CEO executives who occupy important positions in a firm.

Third, to our best knowledge, this study may be the first to examine the influence of the 2015 "pay ceiling" regulation issued by the central government on CEO pay disparity and firm performance. We find that this regulation has significantly reduced CEO pay disparity and the

positive tournament effect on firm performance in SOEs. We argue that policy-makers should thoroughly consider potential side effects when limiting top executives' compensation.

The remainder of this essay is organised as follows: Section 2.2 discusses the literature review and hypothesis development. Section 2.3 describes the data, variable construction, and regression model. Section 2.4 introduces the empirical results. Section 2.5 presents the conclusion.

2.2. Literature review and hypothesis development

Compensation policy is one of the most important factors that affects organisational success (Jensen and Murphy, 1990). The compensation structure of top management teams has received considerable attention from academics and practitioners alike. In particular, CEO pay disparity is central to the corporate remuneration structure. The CEO pay disparity, defined as the pay differential between the CEO and other non-CEO top executives, plays an important role in the inner workings of the top management team and influences firm performance and behaviours significantly (Kale et al., 2009; Bebchuk et al., 2011; Kini and Williams, 2012; Haß et al., 2015; Shen and Zhang, 2018; Ghosh et al., 2023). There are two main competing theories on the role of CEO pay disparity: the rank-order tournament theory and the managerial power theory.

2.2.1. Rank-order tournament theory

The rank-order tournament theory, first proposed by Lazear and Rosen (1981), suggests that large pay gaps provide strong tournament incentives for workers to make a greater effort to garner higher positions. The level of employee compensation stepped increases with the promotion of positions because the wage differences are based not on marginal productivity but instead based on relative differences between the individuals. Therefore, employees can be

rewarded by their rank in an organisation, suggesting that the higher the rank, the higher the salary.

The literature documents the importance of the tournament pay structure and tournament incentives to the management team members. Ehrenberg and Bognanno (1990) study the effect of the compensation structures in professional sports tournaments on team outcomes and find that tournament-type pay structures can lead to better player performance. This kind of compensation system is suitable for certain groups of workers, such as firm executives, sports team members, and college professors. This finding is consistent with Becker and Huselid (1992), who find that tournament compensation systems have a positive influence on individual performance. Moreover, Eriksson (1999) argues that managerial compensation differentials provide effective promotion-based incentives for senior managers to enhance firm performance. Lee et al. (2008) support the tournament theory by showing a positive association between pay dispersion within the management team and corporate performance.

Kale et al. (2009) use the CEO pay gap, defined as the compensation disparity between the CEO and the next level of executives, to proxy the tournament incentives for non-CEO senior executives. The CEO pay gap is also widely employed by existing literature to measure rank-order tournament incentives. Using US-listed firms from 1993 to 2004, Kale et al. (2009) find that the CEO pay gap has a significantly positive effect on firm value and accounting performance: this positive relation is more pronounced if the incumbent CEO is nearing retirement and weaker if the CEO is new. In addition, Chen et al. (2011) document that tournament incentive is positively related to earnings per share as a measure of firm performance in China. Similarly, Hu et al. (2013) examine the relationship between CEO pay disparity and firm performance. Consistent with the rank-order tournament theory, the CEO pay gap provides tournament incentives to non-CEO executives and is associated with better firm performance. Moreover, the positive tournament effect on firm performance is subject to

firm's ultimate controller and CEO political status. Overall, empirical evidence indicates that tournament-style compensation structures are beneficial to both individual and firm performance.

Tournament incentives also greatly affect firm behaviours. For example, the large tournament prizes of senior managers lead to extremely aggressive and competitive behaviours (Siegel and Hambrick, 2005). Kini and Williams (2012) examine the tournament incentives effect of top executives on firm risk and corporate policies and find that the CEO pay gap is significantly associated with higher risk-taking in both non-financial and financial companies in the US market. Tournament incentives also motivate non-CEO executives to engage in corporate fraud (Haß et al., 2015) and earnings management (Park, 2017) to increase their chances of winning the tournament prizes. Jia (2018) suggests that tournament incentives measured by the CEO pay gap lead to a higher stock price crash risk. Tournament incentives for non-CEO top executives are found to impact firm innovation (Shen and Zhang, 2018). These results are consistent with the finding of Goel and Thakor (2008) that tournament prizes strongly motivate top executives to increase their chances of promotion to CEO by taking more risks. Thus, tournament compensation structures have the potential to satisfy employers who want their employees to work harder and take more risks. However, tournament incentives may not always entice non-CEO executives to take more risks. For example, Zhang et al. (2018) document that the promotion-based tournament effect reduces the likelihood of financial restatements in Chinese listed firms because the costs of restatement could be higher than the benefits. Sun et al. (2019) find that tournament incentives are negatively associated with stock price risk. In addition, Zhong et al. (2022) suggest that tournament incentives constrain corporate financial misconduct.

The tournament prize is not always the same since it varies according to the degree of the pay gap and the number of tournament participants. A larger pay disparity and a higher number

of top executives both lead to a greater tournament prize (Eriksson, 1999; Lin et al., 2009; Lin et al., 2013). Thus, a larger CEO pay gap will provide non-CEO executives with more incentives to work harder to increase their chances of becoming the next CEO (Ramakrishan and Thakor, 1991; Goel and Thakor, 2008; Kini and Williams, 2012; Haß et al., 2015). Since rank-order tournaments are schemes of relative performance evaluation and managerial skills are hard to quantify, executives' compensation depends on their performance ranking rather than their actual performance itself. Therefore, top executives will only be able to become the best relative performer and receive the tournament prize by working harder to increase their perceived outputs; this ultimately improves firm performance. This viewpoint supports the notion that a large CEO pay gap provides goals for top executives and incentivises them to work hard, which is beneficial to corporate performance (Main et al., 1993; Eriksson, 1999; Kale et al., 2009; Hu et al., 2013).

Overall, the tournament theory states that a larger pay gap is effective as it provides appropriate incentives for non-CEO executives to exert effort so that they may one day be promoted to CEO of a company. Extant literature follows the method of Kale et al. (2009) and uses the CEO pay gap, defined as the gap between the CEO total pay and the median total pay of non-CEO top executives, to proxy for the tournament incentives for non-CEO top executives. Based on the rank-order tournament theory, the CEO pay gap is expected to have a positive influence on corporate performance. Thus, we offer our first hypothesis:

H1: The CEO pay gap is positively associated with firm performance.

2.2.2. Managerial power theory

Managerial power is defined as the ability of an individual manager to exert his or her will on corporate decision-making (Hickson et al., 1971; Finkelstein, 1992). A powerful CEO may exert his/her desires on the remuneration decisions for their self-interests rather than

shareholders' interests (Lambert et al., 1993). According to the managerial power theory, a large CEO pay disparity reflects the relatively strong power of a CEO in comparison to other top executives (Bebchuk and Fried, 2003; Bebchuk et al., 2011). A larger CEO pay disparity provides CEOs with more incentives to protect their self-interests, such as financial wealth and career security. Thus, a powerful CEO is associated with greater CEO entrenchment and more agency problems that might undermine shareholders' interests and lower firm value (Adams et al., 2005; Bebchuk et al., 2011; Landier et al., 2012). Furthermore, a powerful CEO may be unwilling to develop other top executives' skills or may even hinder their career development, because high-quality executives as potential internal CEO successor candidates may pose a threat to the incumbent CEO's career and financial security (Rajan and Wulf, 2006). Therefore, poor internal promotion incentives for non-CEO executives could result in more job-hopping for high-skilled or talented executives, thereby leading to worse firm performance. For example, high-ability insiders are rare in firms with more entrenched CEOs (Masulis and Mobbs, 2011).

Bebchuk et al. (2011) introduce the CPS as a measure of CEO pay disparity to proxy for the relative importance and managerial power of a CEO. The CPS is the ratio of a CEO's total pay to the sum of the total pay of the top five executives within a firm (including the CEO). The CPS is widely employed in the literature to examine its relationship to firm performance and behaviours. Using a sample of US-listed firms from 1993 to 2004, Bebchuk et al. (2011) find that the CPS is associated with a lower CEO turnover sensitivity to performance and worse firm performance. Mande and Son (2012) document that powerful CEOs proxied by the CPS are more likely to manipulate earnings to meet or just beat analysts' forecasts. Correa and Lel (2016) examine the influences of CEO pay dispersion on firm valuation by using a large sample of firms from 38 countries during the period of 2001 to 2012. Say on pay (SoP) laws as a quasi-

exogenous shock narrow the pay inequality between the CEO and other top executives.[3] Compared with firms not subject to SoP laws, the value of the firms subject to SoP laws significantly increased. These results indicate that CEOs of firms with a higher CPS wield more power and influence over firm decision-making, which leads to decreased corporate performance. Han et al. (2016) examine the relationship between CEO power measured by the CPS and firm performance and find that firms with a higher CPS significantly perform worse under industrywide-downturn pressure. Therefore, a high CPS reflects the potential rent-seeking behaviour of a CEO and can be viewed as an agency problem.

Chen et al. (2013) document a significantly positive association between the CPS and the implied cost of equity and this positive relationship is more salient in firms with more severe agency problems of free cash flow. These findings indicate that a higher CPS reflects stronger CEO entrenchment. In addition, Park (2017) finds that the CPS is associated with more earnings manipulation since dominant CEOs who receive relatively higher compensation may engage in more earnings management activities for their own salary and career security. Chintrakarn et al. (2018) show that firms with a higher CPS are less likely to pay dividends. Shahab et al. (2020) suggest that the CPS is associated with a higher stock price crash risk. These findings are in line with the notion that powerful CEOs are entrenched and are associated with more severe agency problems (Bebchuk et al., 2011). Therefore, a larger CPS indicates that the CEO plays a more dominant role among a firm's top executive team, thereby leading to more agency problems.

Overall, the managerial power view suggests that a large CPS is associated with reduced firm performance. Therefore, we present the following hypothesis:

H2a: The CEO pay slice (CPS) is negatively associated with firm performance.

[3] Say on pay is a corporate law term that refers to when a firm's shareholders have the right to vote on the remuneration of executives.

Most literature examines the relationship between the CPS and firm performance using data from the United States; thus, the conclusions may not apply to other countries. For example, some literature documents the positive effects of the CPS on firm performance. Al-Najjar et al. (2016) find that the CPS is associated with better firm performance in UK listed firms from 2003 to 2009. They argue that the CPS reflects a CEO's managerial talents rather than managerial power. CEOs with outstanding abilities and skills can be rewarded with a relatively higher salary within the top management team. In addition, Hu et al. (2013) document that the CPS plays a positive tournament role in improving firm performance in China. These findings are consistent with those of Burns et al. (2017), who use a cross-country sample including China and the United Kingdom and find that the pay difference between the CEO and other top executives measured by the CPS is associated with enhanced firm value. Therefore, we expect for the CPS to be positively associated with firm performance in China and propose the following hypothesis:

H2b: The CEO pay slice (CPS) is positively associated with firm performance.

2.3. Research design

2.3.1. Data and sample

The initial sample of this study includes all Chinese companies listed on the A-share market in the Shanghai and Shenzhen Stock Exchanges from 2005 to 2018. All data are collected from the China Stock Market and Accounting Research (CSMAR) database. Our sample period starts in 2005, the year that listed firms started to disclose the compensation of top executives (including the chair of the board, CEO, and other top executives).[4]

[4] Only the aggregate amount of payment to the top three executives was disclosed in firm annual reports before 2005.

Following prior literature, we exclude (1) financial firms, (2) special treatment (ST) firms, and (3) firm-year observations with missing data for control variables. The final sample includes 3,316 listed firms with 23,052 firm-year observations. To avoid the impact of outliers, all continuous variables are winsorised at the 1% and 99% levels.

2.3.2. CEO pay disparity

Following Kale et al. (2009) and Bebchuk et al. (2011), we employ two measures to proxy CEO pay disparity: the CEO pay gap (*CPG*) and the CEO pay slice (*CPS*).[5] *CPG* is defined as the difference between a CEO's total compensation and the median total compensation of non-CEO senior executives (Kale et al., 2009; Kini and Williams, 2012; Haß et al., 2015; Shen and Zhang, 2018; Vo and Canil, 2019; Chowdhury and Rahman, 2023; Rahman and Chowdhury, 2023).[6] We exclude from the pay gap estimation former CEOs who remain with the firm in an executive position. However, the natural logarithm is an unsuitable transformation because of the issue of the zero and negative pay gap. Therefore, following prior studies (Kale et al., 2009; Aksoy et al., 2021; Chen et al., 2022; Zhang et al., 2022a), we apply the inverse hyperbolic sine transformation (IHS). [7]

CPG = IHS (Total compensation of CEO − Median total compensation of non-CEO top executives).

CPS is defined as the ratio of a CEO's total compensation to the aggregate compensation of the top five executives of a firm (Bebchuk et al., 2011). Specifically, the top five executives of a firm include the CEO plus the four highest-paid non-CEO executives (Bebchuk et al., 2011).

[5] CPG and CPS are used to measure CEO pay disparity in many prior studies such as Hu et al. (2013), Correa and Lel. (2016), Park (2017), and Vo and Canil (2019).
[6] The non-CEO top executives refer to the next level of top executives such as vice-president (VP), chief financial officer (CFO), chief operating officer (COO) and so on.
[7] The inverse hyperbolic sine transformation is defined as Ln $(y_i + (y_i^2 + 1)^{1/2})$.

CPS = Total compensation of CEO / (Total compensation of top four non-CEO executives + Total compensation of CEO).

The total compensation of an executive is the sum of salary, bonuses, and other cash compensation. Long-term incentives such as stock options and restricted stocks are not included in this compensation because these are rarely exercised in China (Hu et al., 2013).

2.3.3. Firm performance

Following previous studies (Liu et al., 2015; Ding et al., 2018; Li and Jin, 2021; Talavera et al., 2021; Malm et al., 2023), we employ two accounting measures to proxy firm performance: return on assets (*ROA*) and return on equity (*ROE*). *ROA* is calculated as net income divided by total assets[8]. *ROE* refers to net income divided by total equity.

2.3.4. Control variables

Following previous literature such as Kale et al. (2009) and Hu et al. (2013), a series of variables are included to control for other factors that may be related to firm performance. We first include CEO characteristic variables such as *CEO gender*, *CEO age,* and *CEO duality*. *CEO gender* is a dummy variable that equals 1 if a CEO is male and 0 otherwise. *CEO age* is the natural logarithm of a CEO's age. CEO age is negatively associated with firm performance (Cline and Yore, 2016). *CEO duality* is a dummy variable that equals 1 if the CEO and board chair positions are held by the same person and 0 otherwise. Yang and Zhao (2014) find that *CEO duality* is associated with better firm performance. We further include firm characteristic variables: *Firm size*, *Leverage*, *Board size*, *Independence*, *OCF*, *Tang*, *IO*, *Big4*, *Firm age*, *Top1,* and *SOE.* In detail, *Firm size* is defined as the natural logarithm of total assets. *Leverage* is a firm's financial leverage that is calculated as the book value of total debt divided by the

[8] We also use "EBIT divided by total assets" to measure ROA, and the results still robust.

book value of total assets. *Board size* is calculated as the natural logarithm of the total number of directors on a board. *Independence* is the ratio of the number of independent directors to the total number of directors. *OCF* is the ratio of net cash flow from operations to total assets. *Tang* represents the tangible assets over total assets. *IO* indicates the percentage of shares held by institutional investors. *Big4* is a dummy variable that equals 1 if a firm hires an international Big 4 auditor and 0 otherwise. *Firm age* is calculated as the natural logarithm of one plus the number of years since the firm was founded at the end of every year. *Top1* refers to the percentage ownership of the largest shareholder. *SOE* is a dummy variable that equals 1 if the ultimate controller is an SOE or government agency and 0 otherwise. Finally, we include two provincial-level variables: *GDPG* and *POPG*. *GDPG* indicates the annual provincial GDP growth rate and *POPG* is the annual provincial population growth rate.

2.3.5. Model specification

To estimate the relationship between CEO pay disparity and firm performance, we use the following model:

$$Firm\ performance_{i,t} = \beta_0 + \beta_1 CEO\ pay\ disparity_{i,t} + \sum_k \beta_k Controls_{k,i,t} + \epsilon_{i,t} \quad (2.1)$$

where $ROA_{i,t}$ and $ROE_{i,t}$ are the measures of firm performance and $CPG_{i,t}$ and $CPS_{i,t}$ are the measures to proxy CEO pay disparity[9]. $Controls_{k,i,t}$ is a set of control variables on a yearly basis, including $CEO\ gender_{i,t}$, $CEO\ age_{i,t}$, $CEO\ duality_{i,t}$, $Firm\ size_{i,t}$, $Leverage_{i,t}$, $Board\ size_{i,t}$, $Independence_{i,t}$, $OCF_{i,t}$, $Tang_{i,t}$, $IO_{i,t}$, $Big4_{i,t}$, $Firm\ age_{i,t}$, $Top1_{i,t}$, $SOE_{i,t}$, $GDPG_{i,t}$, and $POPG_{i,t}$. Year and firm fixed effects are included in all regressions.

[9] We use CPG/100 to proxy *CPG* in all the regressions to make the coefficients on *CPG* more accurate.

2.4. Empirical results

2.4.1. Descriptive statistics, time trend and correlation matrix

Table 2.1 provides the basic summary statistics of the variables employed in this study. The mean (median) values of *ROA* and *ROE* are 0.041 (0.038) and 0.068 (0.073), respectively. The mean CEO compensation is 654,738 RMB which is much higher than the average median compensation of non-CEO executives at 438,668 RMB. The mean pay gap is 213,818 RMB which is in line with the existence of tournament prizes. The mean value of *CPG* is 10.059. The average CPS is 24.7%, which shows that the total CEO compensation accounts for approximately one-fourth of the total compensation of the top five executives. In addition, 94.5% of CEOs are male, and 24.7% of CEOs also hold the position of chair of the board. The average proportion of independent directors on a board is 36.9%, which satisfies the requirement of the China Securities Regulatory Commission (CSRS) that independent directors must account for at least one-third of the total board members for all listed firms. In addition, 44.9% of the sample companies are SOEs.

Table 2.1. Descriptive statistics

This table reports the descriptive statistics of the main variables. The sample contains 23,052 observations from 3,316 firms listed on the Shanghai and Shenzhen stock exchanges from 2005 to 2018. Detailed definitions of variables are shown in Appendix A.

	(1)	(2)	(3)	(4)	(5)	(6)
	N	Mean	SD	P25	Median	P75
ROA	23,052	0.041	0.053	0.016	0.038	0.068
ROE	23,052	0.068	0.111	0.034	0.073	0.116
CPG	23,052	10.059	7.318	11.464	12.363	13.132
CPS	23,052	0.247	0.069	0.216	0.241	0.277
CEO pay	23,052	654,738	622,640	297,292	487,000	784,800
Median pay	23,052	438,668	336,976	218,325	353,458	552,325
Pay Gap	23,052	213,818	369,372	47,600	117,024	252,438
Top4	23,052	1,975,611	1,620,844	950,625	1,545,000	2,440,450
CEO gender	23,052	0.945	0.228	1.000	1.000	1.000
CEO age	23,052	3.876	0.133	3.784	3.892	3.970
CEO duality	23,052	0.247	0.432	0.000	0.000	0.000

Firm size	23,052	22.000	1.250	21.094	21.829	22.714
Leverage	23,052	0.439	0.207	0.274	0.439	0.598
Board size	23,052	2.168	0.196	2.079	2.197	2.197
Independence	23,052	0.369	0.051	0.333	0.333	0.400
OCF	23,052	0.045	0.071	0.006	0.044	0.087
Tang	23,052	0.234	0.170	0.100	0.199	0.332
IO	23,052	0.064	0.074	0.008	0.036	0.093
Big4	23,052	0.057	0.232	0.000	0.000	0.000
Firm age	23,052	2.695	0.403	2.485	2.773	2.996
Top1	23,052	0.360	0.151	0.241	0.341	0.466
SOE	23,052	0.449	0.497	0.000	0.000	1.000
GDPG	23,052	0.004	0.002	0.003	0.003	0.005
POPG	23,052	0.010	0.022	0.003	0.006	0.012

Table 2.2 reports the time trend of the pay gap and top executives' compensation. Panel A shows that the CEO pay gap and the senior executives' compensation significantly increase from 2005 to 2018. Panels B and C show the time trends in SOEs and private firms, respectively. Compared with private firms, the salaries for CEOs and other top executives are higher in SOEs. Moreover, the CEO pay gap in private firms is greater than that in SOEs. It may reflect more tournament incentives in private firms.

As shown in Panel B, the mean value of the CEO pay gap in SOEs drops significantly in 2015 because of the newly implemented pay ceiling regulation. During this year, the mean CEO compensation of SOEs decreases, while non-CEO executives' average salaries continued to increase in the year 2015, leading to a narrowing of the CEO pay gap in SOEs in 2015. Panel C shows that CEO compensation, other top executives' compensation and the CEO pay gap, all continue to increase year by year in private firms since they are not affected by the pay ceiling regulation.

Table 2.2. Time trend

This table displays the time trend of the CEO pay gap and top executives' compensation. Panel A shows the distribution of the full sample. Panels B and C report the distribution of the sub-sample of SOEs and private firms, respectively.

Panel A: Full sample

Year	CEO pay gap	CEO pay	Median pay	Top4
2005	81,659	258,395	176,011	752,759
2006	91,962	292,594	199,379	868,379
2007	132,646	405,275	272,473	1,188,127
2008	147,513	453,206	304,103	1,331,397
2009	153,771	476,942	322,839	1,422,687
2010	185,024	550,750	363,931	1,604,063
2011	200,182	600,250	397,291	1,766,398
2012	200,579	619,857	416,107	1,842,725
2013	207,904	651,655	441,792	1,984,542
2014	219,702	685,857	463,186	2,082,507
2015	239,844	728,275	487,271	2,213,052
2016	248,021	765,966	516,732	2,361,884
2017	278,409	841,285	558,377	2,555,772
2018	307,942	935,604	624,085	2,858,607

Panel B: SOEs

Year	CEO pay gap	CEO pay	Median pay	Top4
2005	69,608	251,062	181,651	768,401
2006	87,954	299,110	209,096	892,295
2007	128,057	424,191	295,561	1,278,368
2008	132,522	462,885	327,968	1,427,053
2009	133,536	489,707	355,929	1,540,447
2010	167,210	591,833	423,151	1,854,391
2011	179,623	657,863	476,213	2,083,769
2012	179,408	670,507	489,070	2,133,138
2013	184,572	701,276	516,158	2,266,904
2014	196,755	733,757	534,351	2,351,632
2015	181,705	726,545	546,763	2,436,359
2016	183,378	762,036	578,010	2,551,428
2017	217,922	859,511	637,996	2,805,583
2018	242,706	955,849	708,636	3,135,651

Panel C: Non-SOEs

Year	CEO pay gap	CEO pay	Median pay	Top4
2005	114,085	278,124	160,834	710,672
2006	101,900	276,432	175,280	809,064
2007	142,279	365,572	224,011	998,709
2008	175,616	435,061	259,363	1,152,077
2009	183,819	457,986	273,699	1,247,815
2010	203,433	508,296	302,734	1,345,380
2011	217,336	552,177	331,436	1,501,577
2012	216,538	581,676	361,106	1,623,807
2013	225,027	615,239	387,215	1,777,321
2014	235,199	653,507	415,125	1,900,751
2015	275,343	729,332	450,945	2,076,703
2016	283,072	768,097	483,506	2,259,110
2017	306,806	832,729	520,998	2,438,493
2018	338,700	926,059	584,220	2,727,986

Table 2.3 shows the correlation matrix for the main variables. Both *CPG* and *CPS* are positively correlated with *ROA* and *ROE*. The preliminary results show evidence of the positive effects of CEO pay disparity on firm performance, which supports Hypothesis H1. Most of the correlations reported are between −0.20 and 0.20. The highest correlation is between *ROA* and *ROE* at 0.849, and the second highest correlation is between *CPG* and *CPS* at 0.645. This is reasonable because *ROA* and *ROE* measure firm performance, and *CPG* and *CPS* measure CEO pay disparity. Overall, the correlations do not indicate any serious multicollinearity problems.

Table 2.3. Correlation matrix

This table reports the Pearson correlation matrix for the variables in the analysis. Detailed definitions of variable

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1. ROA	1.000													
2. ROE	0.849***	1.000												
3. CPG	0.077***	0.081***	1.000											
4. CPS	0.071***	0.057***	0.645***	1.000										
5. CEO gender	-0.027***	-0.026***	-0.002	-0.034***	1.000									
6. CEO age	0.011	0.013	0.061***	0.045***	0.012	1.000								
7. CEO duality	0.074***	0.027***	0.013*	0.097***	0.020**	0.167***	1.000							
8. Firm size	-0.052***	0.079***	-0.017*	-0.117***	0.023***	0.142***	-0.168***	1.000						
9. Leverage	-0.415***	-0.154***	-0.014*	-0.067***	0.029***	0.002	-0.181***	0.475***	1.000					
10. Board size	-0.014*	0.016*	0.023***	-0.055***	0.071***	0.026***	-0.193***	0.211***	0.162***	1.000				
11. Independence	-0.007	-0.004	-0.044***	-0.016*	-0.044***	0.025***	0.120***	0.052***	-0.014*	-0.463***	1.000			
12. OCF	0.380***	0.283***	0.012	0.014*	-0.010	0.040***	-0.031***	0.020**	-0.152***	0.060***	-0.033***	1.000		
13. Tang	-0.128***	-0.118***	-0.014*	-0.018**	0.050***	0.034***	-0.124***	0.070***	0.114***	0.176***	-0.081***	0.270***	1.000	
14. IO	0.219***	0.228***	0.029***	0.005	-0.001	-0.012	-0.027***	0.203***	0.039***	0.053***	-0.001	0.107***	-0.057***	1.000
15. Big4	0.039***	0.066***	-0.015*	-0.053***	0.004	0.051***	-0.066***	0.361***	0.100***	0.100***	0.048***	0.078***	0.052***	0.029***
16. Firm age	-0.108***	-0.059***	-0.010	-0.024***	-0.019**	0.151***	-0.067***	0.228***	0.153***	-0.023***	0.005	-0.018**	-0.031***	0.014*
17. Top1	0.119***	0.128***	-0.047***	-0.055***	-0.011	0.032***	-0.041***	0.193***	0.052***	0.009	0.041***	0.091***	0.070***	-0.097***
18. SOE	-0.143***	-0.059***	-0.040***	-0.144***	0.074***	0.077***	-0.310***	0.313***	0.321***	0.286***	-0.082***	0.056***	0.241***	0.031***
19. GDPG	0.027***	0.051***	0.029***	0.035***	0.023***	-0.149***	-0.079***	-0.154***	0.078***	0.132***	-0.069***	0.006	0.105***	0.035***
20. POPG	0.048***	0.041***	0.022***	0.013*	0.004	-0.017**	-0.000	0.009	-0.016*	0.023***	0.002	-0.006	-0.054***	0.012

2.4.2. Baseline results

Table 2.4 reports the results of the regression on the impact of CEO pay disparity on firm performance based on Equation (2.1). As shown in Columns (1) and (2), the coefficients on *CPG* are 0.032 (*ROA*) and 0.074 (*ROE*) and are statistically significant at the 1% level.[10] This result indicates that the CEO pay gap is significantly and positively associated with firm performance. In terms of the economic significance, for example in Columns (1) and (3), an increase of the *CPG* (*CPS*) by one standard deviation is associated with an increase of 5.70% (4.21%) of *ROA*[11]. Thus, this finding supports the rank-order tournament theory that a large CEO pay disparity provides non-CEO executives with tournament incentives that lead to better firm performance. Similarly, the coefficients on *CPS* in Columns (3) and (4) are 0.025 (*ROA*) and 0.057 (*ROE*) and are also positive and statistically significant at the l% level. This finding is not consistent with the managerial power theory but supports the tournament theory. Thus, in the Chinese setting, *CPS* serves as a measure of CEO pay disparity reflecting tournament incentives for non-CEO top executives. Therefore, Hypotheses H1 and H2b are supported.

The positive coefficients on *Firm size* indicate that larger firms perform better. Firms with a higher debt ratio measured by *Leverage* are significantly associated with worse performance. *IO* is positively associated with both *ROA* and *ROE*, which is consistent with the finding of Lin and Fu (2017) that institutional ownership is associated with better firm performance.

[10] We also employ three alternative measures to proxy for the CEO pay gap. The first one is the natural logarithm of the difference between CEO pay and the average pay of non-CEO executives in the top management team. The second one is the ratio of CEO pay and the median pay of non-CEO executives. The third one is the ratio of CEO pay and the average pay of non-CEO executives. The baseline results remain robust to these alternative measures of the CEO pay gap.

[11] We follow Biswas et al. (2023) and Wang et al. (2023) to calculate the economic significance. For example, 5.70% = 0.032 (coefficient on *CPG*)*0.073 (standard deviation of *CPG*) / 0.041 (mean value of *ROA*). 4.21% = 0.025 (coefficient on *CPS*)*0.069 (standard deviation of *CPS*) / 0.041 (mean value of *ROA*).

Table 2.4. CEO pay disparity and firm performance

This table reports the impact of CEO pay disparity on firm performance in Chinese listed firms. This table reports the coefficients of the regression as follows:

$$Firm\ performance_{i,t} = \beta_0 + \beta_1 CEO\ pay\ disparity_{i,t} + \sum_k \beta_k Controls_{k,i,t} + \epsilon_{i,t}$$

$ROA_{i,t}$ and $ROE_{i,t}$ are the measures of firm performance. *CPG* and *CPS* to proxy CEO pay disparity. Controls is a set of control variables on a yearly basis, including *CEO gender, CEO age, CEO duality, Firm size, Leverage, Board size, Independence, OCF, Tang, IO, Big4, Firm age, Top1, SOE, GDPG, POPG*. All continuous variables are winsorized at the 1% level in each tail, and the detailed definitions of all variables are shown in Appendix A. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1) *ROA*	(2) *ROE*	(3) *ROA*	(4) *ROE*
CPG	0.032***	0.074***		
	(7.840)	(7.222)		
CPS			0.025***	0.057***
			(5.248)	(4.745)
CEO gender	-0.003	-0.003	-0.002	-0.002
	(-1.553)	(-0.604)	(-1.387)	(-0.453)
CEO age	-0.004	-0.002	-0.003	-0.001
	(-1.336)	(-0.332)	(-1.151)	(-0.154)
CEO duality	0.002**	0.004	0.002*	0.004
	(2.039)	(1.544)	(1.899)	(1.420)
Firm size	0.007***	0.017***	0.007***	0.017***
	(10.932)	(9.868)	(11.130)	(10.048)
Leverage	-0.116***	-0.141***	-0.116***	-0.142***
	(-43.627)	(-20.878)	(-43.691)	(-20.955)
Board size	0.005**	0.002	0.006**	0.003
	(1.998)	(0.322)	(2.064)	(0.384)
Independence	-0.007	-0.019	-0.007	-0.021
	(-0.786)	(-0.879)	(-0.863)	(-0.950)
OCF	0.157***	0.293***	0.157***	0.293***
	(35.378)	(25.994)	(35.364)	(25.991)
Tang	-0.056***	-0.115***	-0.056***	-0.115***
	(-17.025)	(-13.682)	(-16.998)	(-13.663)
IO	0.101***	0.227***	0.101***	0.228***
	(21.593)	(19.150)	(21.602)	(19.161)
Big4	0.006**	0.008	0.006**	0.008
	(2.344)	(1.228)	(2.364)	(1.247)
Firm age	-0.026***	-0.039***	-0.026***	-0.040***
	(-7.771)	(-4.630)	(-7.812)	(-4.672)
Top1	0.081***	0.182***	0.080***	0.182***
	(18.459)	(16.419)	(18.379)	(16.347)
SOE	-0.010***	-0.023***	-0.010***	-0.023***
	(-4.680)	(-4.526)	(-4.657)	(-4.507)
GDPG	0.566**	2.252***	0.574**	2.271***
	(2.133)	(3.336)	(2.160)	(3.362)
POPG	0.009	-0.021	0.010	-0.018

	(0.664)	(-0.603)	(0.754)	(-0.517)
Constant	-0.039**	-0.223***	-0.048**	-0.243***
	(-2.003)	(-4.471)	(-2.425)	(-4.854)
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	23,052	23,052	23,052	23,052
Adjusted R^2	0.542	0.327	0.541	0.326

2.4.3. CEO pay disparity and firm performance: SOEs and Non-SOEs

We further examine whether the enhanced firm performance through a large CEO pay disparity applies to both SOEs and non-SOEs. It is possible that the CEO pay disparity may provide less tournament incentive for improving firm performance in SOEs than in non-SOEs (Hu et al., 2013). First, SOEs have responsibility to satisfy multiple economic and social goals imposed by governments (Chang and Wong, 2009), thus SOEs are not exactly seeking for better firm performance. Second, there are alternative incentives exist within SOEs, e.g., SOE managers have strong incentives to seek political promotions which can bring huge benefits such as privileges, perks, and social status (Jiang and Kim, 2020). In Table 2.5, we split the full sample into subsamples of SOEs and non-SOEs based on the ultimate controller of the sample firms. The SOE subsample includes firms whose ultimate controllers are government agencies or SOEs, and the non-SOE subsample contains firms whose ultimate controllers are private firms or an individual. We then re-run our baseline regression (Table 2.4) using the subsamples of SOEs and non-SOEs separately.

As shown in Table 2.5, the positive and significant association between CEO pay disparity and firm performance exists in both SOEs and non-SOEs. This indicates that CEO pay disparity, as a corporate governance mechanism, plays an important role in enhancing firm performance in China. Thus, a large CEO pay disparity provides promotion-based tournament incentives for non-CEO executives, leading to better firm performance.

Table 2.5. CEO pay disparity and firm performance: SOEs and Non-SOEs

This table shows the regression results of subsample analyses based on firms' ownership structure (SOEs/Non-SOEs). A firm is classified as an SOE if the firm's ultimate controller is an SOE or government agency. *CPG*, *CPS*, *ROA*, *ROE*, and *Controls* are the same as in Table 4. Appendix A presents the detailed variable definitions. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: SOEs subsample

	(1) *ROA*	(2) *ROE*	(3) *ROA*	(4) *ROE*
CPG	0.023***	0.066***		
	(4.458)	(4.469)		
CPS			0.025***	0.071***
			(3.556)	(3.570)
CEO gender	0.001	0.006	0.001	0.006
	(0.209)	(0.832)	(0.278)	(0.901)
CEO age	0.008*	0.030**	0.008*	0.031**
	(1.747)	(2.416)	(1.827)	(2.495)
CEO duality	-0.001	-0.002	-0.001	-0.002
	(-0.817)	(-0.498)	(-0.877)	(-0.558)
Firm size	0.008***	0.018***	0.008***	0.019***
	(7.901)	(6.597)	(8.021)	(6.717)
Leverage	-0.132***	-0.188***	-0.132***	-0.189***
	(-34.307)	(-17.375)	(-34.351)	(-17.423)
Board size	-0.005	-0.018*	-0.005	-0.018*
	(-1.437)	(-1.783)	(-1.432)	(-1.778)
Independence	-0.026**	-0.078**	-0.027**	-0.080**
	(-2.360)	(-2.517)	(-2.412)	(-2.569)
OCF	0.150***	0.310***	0.150***	0.310***
	(24.370)	(17.845)	(24.353)	(17.831)
Tang	-0.047***	-0.109***	-0.047***	-0.109***
	(-10.978)	(-8.957)	(-10.953)	(-8.933)
IO	0.111***	0.265***	0.111***	0.265***
	(17.203)	(14.574)	(17.203)	(14.575)
Big4	0.005*	0.003	0.005*	0.003
	(1.908)	(0.353)	(1.951)	(0.397)
Firm age	-0.027***	-0.051***	-0.027***	-0.053***
	(-5.342)	(-3.640)	(-5.458)	(-3.756)
Top1	0.038***	0.121***	0.038***	0.120***
	(6.263)	(6.975)	(6.213)	(6.925)
GDPG	0.232	1.778*	0.236	1.788*
	(0.694)	(1.883)	(0.704)	(1.893)
POPG	-0.012	-0.026	-0.012	-0.025
	(-0.752)	(-0.578)	(-0.734)	(-0.560)
Constant	-0.043	-0.260***	-0.050*	-0.279***
	(-1.468)	(-3.123)	(-1.688)	(-3.345)
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	10,344	10,344	10,344	10,344
Adjusted R^2	0.563	0.364	0.562	0.364

Panel B: Non-SOEs subsample

	(1) *ROA*	(2) *ROE*	(3) *ROA*	(4) *ROE*
CPG	0.035***	0.069***		
	(5.764)	(4.939)		
CPS			0.021***	0.047***
			(3.321)	(3.178)
CEO gender	-0.003	-0.003	-0.003	-0.003
	(-1.271)	(-0.624)	(-1.098)	(-0.480)
CEO age	-0.010**	-0.017*	-0.009**	-0.017*
	(-2.488)	(-1.914)	(-2.370)	(-1.845)
CEO duality	0.004***	0.008***	0.004***	0.008***
	(3.190)	(2.748)	(3.115)	(2.669)
Firm size	0.007***	0.017***	0.007***	0.017***
	(7.418)	(7.693)	(7.481)	(7.759)
Leverage	-0.092***	-0.082***	-0.092***	-0.083***
	(-24.323)	(-9.496)	(-24.335)	(-9.517)
Board size	0.018***	0.033***	0.018***	0.034***
	(4.314)	(3.544)	(4.410)	(3.631)
Independence	0.023*	0.062**	0.023*	0.061**
	(1.773)	(2.076)	(1.741)	(2.049)
OCF	0.154***	0.261***	0.154***	0.261***
	(24.797)	(18.315)	(24.796)	(18.315)
Tang	-0.062***	-0.107***	-0.062***	-0.107***
	(-12.030)	(-9.048)	(-12.043)	(-9.055)
IO	0.094***	0.191***	0.095***	0.191***
	(14.211)	(12.485)	(14.213)	(12.485)
Big4	0.006	0.015	0.005	0.015
	(1.194)	(1.426)	(1.161)	(1.400)
Firm age	-0.016***	-0.018*	-0.016***	-0.018*
	(-3.475)	(-1.734)	(-3.478)	(-1.730)
Top1	0.117***	0.245***	0.117***	0.245***
	(17.820)	(16.260)	(17.859)	(16.294)
GDPG	1.146***	2.918***	1.151***	2.924***
	(2.738)	(3.036)	(2.747)	(3.040)
POPG	0.035	-0.025	0.037	-0.021
	(1.504)	(-0.460)	(1.588)	(-0.388)
Constant	-0.097***	-0.350***	-0.103***	-0.364***
	(-3.456)	(-5.442)	(-3.680)	(-5.646)
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	12,708	12,708	12,708	12,708
Adjusted R^2	0.541	0.354	0.540	0.353

2.4.4. Cross-section tests

In this section, we examine the moderating effects of a CEO's characteristics and non-CEO executives' characteristics on the role of tournament incentives in increasing firm performance.

2.4.4.1. CEO pay disparity and firm performance: does CEO political connection matter?

We first investigate the moderating effects of a CEO's political connection on the association between CEO pay disparity and firm performance. Following Fan et al. (2007), Sun and Zou (2021) and Qian and Chen (2021), we employ politically connected CEO (*PC*) as a dummy variable that equals 1 if the CEO has held a prior position in the central government, local government, was or is a committee member of the Chinese People's Political Consultative Conference (CPPCC), or a committee member of the National People's Congress (NPC). Politically connected CEOs are more likely to entrench themselves by providing unique political capital (Cao et al., 2017), and they face a lower replacement probability (You and Du, 2012; Cao et al., 2017). Thus, in a firm with a politically connected CEO, non-CEO executives may have less opportunity to be promoted to the next CEO. We expect that the impact of tournament incentives for non-CEO executives is dampened in firms with politically connected CEOs.

To examine the moderating effects of politically connected CEOs on the relationship between CEO pay disparity and firm performance, we estimate the following regression model:

$$Firm\ performance_{i,t} = \beta_0 + \beta_1 CEO\ pay\ disparity * PC_{i,t} + \beta_2 CEO\ pay\ disparity_{i,t}$$

$$+\beta_3 PC_{i,t} + \sum_k \beta_k Controls_{k,i,t} + \epsilon_{i,t} \quad (2.2)$$

where *CEO pay disparity*PC*$_{i,t}$ is the independent variable of interest and includes the interaction term between the CEO pay gap (*CPG*) and the politically connected CEO dummy (*PC*), and the interaction term between the CEO pay slice (*CPS*) and the politically connected

CEO dummy (*PC*). Other variables are consistent with those used in Equation (2.1) and are defined in Appendix A.

Table 2.6 reports the regression results and shows that the coefficients for *CPG*PC* are negative and significant at the 5% level[12], and the coefficients for *CPS*PC* are negative and significant at the 10% level. These results indicate that politically connected CEOs significantly weaken the positive association between CEO pay disparity and firm performance. Therefore, when a CEO is politically connected, it is more difficult for other non-CEO executives to compete with the CEO, which makes tournament incentives less effective.

Table 2.6. CEO pay disparity and firm performance: does CEO political connection matter?

This table reports the regression results of the effect of CEO pay disparity on firm performance concerning CEO's political connection.

$$Firm\ performance_{i,t} = \beta_0 + \beta_1 CEO\ pay\ disparity * PC_{i,t} + \beta_2 CEO\ pay\ disparity_{i,t} + \beta_3 PC_{i,t} + \sum_k \beta_k Controls_{k,i,t} + \epsilon_{i,t}$$

$ROA_{i,t}$ and $ROE_{i,t}$ are the measures of firm performance. $CEO\ pay\ disparity * PC_{i,t}$ is the interaction term between $CPG_{i,t}$ and $PC_{i,t}$, and $CPS_{i,t}$ and $PC_{i,t}$. *CPG* is the natural logarithm of the gap between CEO pay and the median pay of all other executives in the top management team. *CPS* is the fraction of aggregate compensation of the top five members in the executive team that is captured by the CEO. *PC* is a dummy variable that equals one if the CEO is politically connected and zero otherwise. *Controls* are the same as in Table 2.4. All continuous variables are winsorized at the 1% level in each tail, and the detailed definitions of all variables are shown in Appendix A. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1) *ROA*	(2) *ROE*	(3) *ROA*	(4) *ROE*
*CPG*PC*	-0.016**	-0.035**		
	(-2.017)	(-2.103)		
CPG	0.077***	0.045***		
	(6.302)	(6.585)		
*CPS*PC*			-0.021*	-0.050*
			(-1.825)	(-1.819)
CPS			0.028***	0.062***
			(5.079)	(4.673)
PC	0.001	0.002	0.004	0.011
	(0.698)	(1.091)	(1.382)	(1.495)
CEO gender	-0.001	-0.003	-0.001	-0.002
	(-1.072)	(-1.046)	(-0.441)	(-0.488)

[12] As for economic significance, an increase of one standard deviation in *CPG* reduced the *ROA* by approximately 2.42%. Following Long et al. (2020), we calculated economic significance as (coefficient of *CPG*PC* × standard deviation of *CPG* when *PC* = 1) / mean of *ROA* when *PC* = 1. That equalled (-0.016*0.071) / (0.047) = -2.42%.

CEO age	0.000	-0.001	-0.004	-0.003
	(0.044)	(-0.175)	(-1.176)	(-0.333)
CEO duality	0.001*	0.002	0.003***	0.006**
	(1.908)	(1.585)	(2.846)	(2.387)
Firm size	0.003***	0.006***	0.007***	0.017***
	(4.489)	(5.331)	(8.929)	(8.841)
Leverage	-0.076***	-0.031***	-0.107***	-0.118***
	(-34.591)	(-7.043)	(-35.811)	(-16.254)
Board size	0.008***	0.013***	0.011***	0.015**
	(3.675)	(2.844)	(3.633)	(1.961)
Independence	0.000	0.004	-0.000	-0.009
	(0.055)	(0.315)	(-0.024)	(-0.399)
OCF	0.111***	0.202***	0.151***	0.277***
	(32.401)	(29.116)	(32.194)	(24.239)
Tang	-0.046***	-0.081***	-0.058***	-0.107***
	(-16.690)	(-14.584)	(-15.221)	(-11.634)
IO	0.076***	0.157***	0.092***	0.202***
	(20.561)	(21.092)	(18.177)	(16.496)
Big4	0.001	-0.001	0.004	0.006
	(0.321)	(-0.300)	(1.471)	(0.798)
Firm age	-0.015***	-0.018***	-0.015***	-0.009
	(-5.213)	(-3.115)	(-3.852)	(-0.998)
Top1	0.066***	0.131***	0.092***	0.199***
	(17.719)	(17.467)	(18.160)	(16.063)
SOE	-0.009***	-0.021***	-0.010***	-0.032***
	(-4.429)	(-5.393)	(-3.742)	(-4.992)
GDPG	0.641***	1.520***	0.684**	2.155***
	(3.183)	(3.733)	(2.490)	(3.225)
POPG	-0.003	-0.017	0.001	-0.028
	(-0.276)	(-0.729)	(0.066)	(-0.724)
Constant	0.013	-0.074**	-0.073***	-0.324***
	(0.684)	(-2.173)	(-2.807)	(-5.129)
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	20,018	20,018	20,018	20,018
Adjusted R^2	0.613	0.467	0.563	0.360

2.4.4.2. CEO pay disparity and firm performance: does CEO tenure matter?

We next investigate the moderating effects of CEO tenure on the relationship between CEO pay disparity and firm performance. Prior studies prove that CEO tenure is an important dimension of CEO power (Hill and Phan, 1991; Bebchuk and Fried, 2003; Adams et al., 2005; Onali et al., 2016; Korkeamäki et al., 2017; Muttakin et al., 2018; Shahab et al., 2020). As a CEO's time in a firm grows, so does their potential to accumulate power and strengthen their

control over internal monitoring mechanisms. Chava et al. (2010) find that CEOs with longer tenures tend to have the increased ability to shape the corporate management structure to enhance their power. Moreover, CEOs with longer tenures are more likely to be insulated from monitoring by the board and the threat of dismissal (Bazrafshan et al., 2021). Therefore, in a firm with a CEO with a long tenure, non-CEO executives tend to have a lower chance of being promoted to the next CEO. Thus, the efficiency of tournament incentives is expected to be reduced in firms managed by CEOs with long tenures.

We establish the regression model below to investigate the moderating effects of CEO tenure on the association between CEO pay disparity and firm performance.

$$Firm\ performance_{i,t} = \beta_0 + \beta_1 CEO\ pay\ disparity * Tenure_{i,t} + \beta_2 CEO\ pay\ disparity_{i,t}$$

$$+\beta_3 Tenure_{i,t} + \sum_k \beta_k Controls_{k,i,t} + \epsilon_{i,t} \quad (2.3)$$

where *Tenure* is the natural logarithm of the number of years that a CEO has served as CEO in a sample firm. *CEO pay disparity*Tenure*$_{i,t}$ is the independent variable of interest and includes the interaction term between the CEO pay gap (*CPG*) and CEO tenure (*Tenure*), and the interaction term between the CEO pay slice (*CPS*) and CEO tenure (*Tenure*). Other variables are consistent with those used in Equation (2.1) and are defined in Appendix A.

Table 2.7 shows that both *CPG*Tenure* [13] and *CPS*Tenure* are negatively and significantly associated with both *ROA* and *ROE*. These results indicate that CEO tenure significantly reduces the positive association between CEO pay disparity and firm performance. Thus, non-CEO executives are less likely to be motivated by tournament incentives in firms managed by CEOs with longer tenures.

[13] Thanks for examiner's suggested solution, for example in Column (1), we calculate the economic significance as: The change in *ROA* relative to a one standard deviation change in *CPG* = coefficient on *CPG* (0.042) + [coefficient on *CPG*Tenure* (-0.011) * standard deviation of *Tenure* (0.658)] = 3.48%.

Table 2.7. CEO pay disparity and firm performance: does CEO tenure matter?

This table reports the regression results for the effect of CEO pay disparity on firm performance concerning CEO's tenure.

$$Firm\ performance_{i,t} = \beta_0 + \beta_1 CEO\ pay\ disparity * Tenure_{i,t} + \beta_2 CEO\ pay\ disparity_{i,t} + \beta_3 Tenure_{i,t} + \sum_k \beta_k Controls_{k,i,t} + \epsilon_{i,t}$$

$ROA_{i,t}$ and $ROE_{i,t}$ are the measures of firm performance. $CEO\ pay\ disparity * Tenure_{i,t}$ is the interaction term between $CPG_{i,t}$ and $Tenure_{i,t}$, and $CPS_{i,t}$ and $Tenure_{i,t}$. *CPG* is the natural logarithm of the gap between CEO pay and the median pay of all other executives in the top management team. *CPS* is the fraction of aggregate compensation of the top five members in the executive team that is captured by the CEO. *Tenure* is the natural logarithm of the number of years that the CEO has served as the CEO in the sample firm. *Controls* are the same as in Table 2.4. All continuous variables are winsorized at the 1% level in each tail, and the detailed definitions of all variables are shown in Appendix A. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1) *ROA*	(2) *ROE*	(3) *ROA*	(4) *ROE*
*CPG*Tenure*	-0.011**	-0.028**		
	(-2.098)	(-2.172)		
CPG	0.042***	0.099***		
	(6.800)	(6.346)		
*CPS*Tenure*			-0.023***	-0.055***
			(-4.082)	(-3.892)
CPS			0.048***	0.112***
			(6.410)	(5.874)
Tenure	0.001	0.002	0.005***	0.014***
	(0.875)	(1.402)	(3.910)	(3.933)
CEO gender	-0.003	-0.003	-0.002	-0.002
	(-1.558)	(-0.605)	(-1.439)	(-0.500)
CEO age	-0.003	-0.002	-0.003	-0.002
	(-1.103)	(-0.281)	(-1.108)	(-0.282)
CEO duality	0.002**	0.004	0.002*	0.003
	(1.997)	(1.481)	(1.865)	(1.372)
Firm size	0.007***	0.017***	0.007***	0.017***
	(10.947)	(9.875)	(11.084)	(9.993)
Leverage	-0.116***	-0.141***	-0.116***	-0.142***
	(-43.583)	(-20.851)	(-43.697)	(-20.967)
Board size	0.006**	0.002	0.006**	0.002
	(2.020)	(0.336)	(2.033)	(0.345)
Independence	-0.007	-0.019	-0.007	-0.020
	(-0.773)	(-0.872)	(-0.836)	(-0.929)
OCF	0.157***	0.293***	0.157***	0.293***
	(35.379)	(25.994)	(35.373)	(25.997)

Tang	-0.056***	-0.115***	-0.056***	-0.115***
	(-16.975)	(-13.663)	(-16.973)	(-13.667)
IO	0.101***	0.228***	0.101***	0.228***
	(21.653)	(19.196)	(21.679)	(19.219)
Big4	0.006**	0.008	0.006**	0.008
	(2.353)	(1.238)	(2.377)	(1.259)
Firm age	-0.026***	-0.040***	-0.026***	-0.040***
	(-7.750)	(-4.659)	(-7.833)	(-4.735)
Top1	0.080***	0.182***	0.080***	0.182***
	(18.368)	(16.361)	(18.351)	(16.351)
SOE	-0.009***	-0.023***	-0.009***	-0.023***
	(-4.646)	(-4.504)	(-4.588)	(-4.454)
GDPG	0.577**	2.275***	0.594**	2.316***
	(2.172)	(3.370)	(2.236)	(3.429)
POPG	0.009	-0.020	0.011	-0.017
	(0.675)	(-0.585)	(0.777)	(-0.492)
Constant	-0.043**	-0.226***	-0.052***	-0.249***
	(-2.134)	(-4.472)	(-2.614)	(-4.892)
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	23,052	23,052	23,052	23,052
Adjusted R^2	0.542	0.327	0.542	0.326

2.4.4.3. CEO pay disparity and firm performance: does non-CEO executives' gender matter?

We then study the moderating effects of non-CEO executives' gender on the relationship between CEO pay disparity and firm performance. Non-CEO executives' gender is an essential characteristic that may shape the efficiency of tournament incentives. Only 5.5% of firms in our sample have female CEOs, which is consistent with the finding of prior Chinese studies such as Fang and Mallin (2018) and Liao et al. (2019). This indicates that female non-CEO executives have very limited chances to be promoted to the CEO position. In addition, extant literature documents that female top executives tend to be more risk-averse and conservative than their male peers (Byrnes et al., 1999; Charness and Gneezy, 2012; Liao et al., 2019; Li et al., 2022). Therefore, female non-CEO executives may be less sensitive to tournament

incentives compared with male non-CEO executives. The effectiveness of promotion-based tournament incentives is expected to be less pronounced in firms with more female non-CEO executives.

To examine the moderating effects of non-CEO executives' gender on the relationship between CEO pay disparity and firm performance, the following regression model is formulated:

$$Firm\ performance_{i,t} = \beta_0 + \beta_1 CEO\ pay\ disparity * Female_{i,t} + \beta_2 CEO\ pay\ disparity_{i,t} + \beta_3 Female_{i,t} + \sum_k \beta_k Controls_{k,i,t} + \epsilon_{i,t} \quad (2.4)$$

where $Female_{i,t}$ is the female ratio of non-CEO executives of firm *i* in year *t*. Other variables are consistent with those used in Equation (2.1) and are defined in Appendix A. $CEO\ pay\ disparity$ *$Female_{i,t}$ is the independent variable of interest and includes the interaction term between the CEO pay gap (*CPG*) and the female ratio of non-CEO executives (*Female*), and the interaction term between the CEO pay slice (*CPS*) and the female ratio of non-CEO executives (*Female*).

Table 2.8 shows that the coefficients on *CPG*Female* are negative and significant at least at the 5% level, and the coefficients on *CPS*Female* are negative and significant at least at the 10% level. These results suggest that the number of female non-CEO executives significantly mitigates the positive effect of CEO pay disparity on firm performance. Therefore, female non-CEO executives tend to be less motivated by tournament incentives to compete for the next CEO position in the listed firms. We argue that the sensitivity to tournament incentives of female executives calls for future research.

Table 2.8. CEO pay disparity and firm performance: does non-CEO executives' gender matter?

This table reports the regression results for the effect of CEO pay disparity on firm performance concerning the female ratio of non-CEO executives.

$$Firm\ performance_{i,t} = \beta_0 + \beta_1 CEO\ pay\ disparity * Female_{i,t} + \beta_2 CEO\ pay\ disparity_{i,t} + \beta_3 Female_{i,t} + \sum_k \beta_k Controls_{k,i,t} + \epsilon_{i,t}$$

$ROA_{i,t}$ and $ROE_{i,t}$ are the measures of firm performance. $CEO\ pay\ disparity * Female_{i,t}$ is the interaction term between $CPG_{i,t}$ and $Female_{i,t}$, and $CPS_{i,t}$ and $Female_{i,t}$. *CPG* is the natural logarithm of the gap between CEO pay and the median pay of all other executives in the top management team. *CPS* is the fraction of aggregate compensation of the top five members in the executive team that is captured by the CEO. *Female* is the female ratio of non-CEO executives of a sample firm. *Controls* are the same as in Table 2.4. All continuous variables are winsorized at the 1% level in each tail, and the detailed definitions of all variables are shown in Appendix A. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
	ROA	*ROE*	*ROA*	*ROE*
*CPG*Female*	-0.168***	-0.231**		
	(-4.649)	(-2.511)		
CPG	0.677***	0.961***		
	(4.875)	(2.720)		
*CPS*Female*			-0.046*	-0.166***
			(-1.813)	(-2.581)
CPS			0.033***	0.087***
			(5.085)	(5.306)
Female	-0.002	-0.008	0.009	0.034*
	(-0.871)	(-1.154)	(1.326)	(1.918)
CEO gender	-0.003	-0.002	-0.002	-0.002
	(-1.543)	(-0.563)	(-1.431)	(-0.461)
CEO age	-0.003	-0.002	-0.003	-0.001
	(-1.081)	(-0.201)	(-1.057)	(-0.192)
CEO duality	0.002**	0.004	0.002*	0.004
	(2.063)	(1.563)	(1.872)	(1.429)
Firm size	0.007***	0.017***	0.007***	0.017***
	(11.054)	(9.915)	(10.903)	(10.015)
Leverage	-0.116***	-0.141***	-0.115***	-0.142***
	(-43.631)	(-20.863)	(-43.074)	(-20.936)
Board size	0.006**	0.002	0.005**	0.003
	(2.027)	(0.334)	(1.999)	(0.372)
Independence	-0.006	-0.018	-0.008	-0.020
	(-0.729)	(-0.840)	(-0.948)	(-0.925)

OCF	0.156***	0.292***	0.157***	0.293***
	(35.350)	(25.974)	(35.343)	(26.000)
Tang	-0.056***	-0.115***	-0.056***	-0.115***
	(-17.000)	(-13.663)	(-16.912)	(-13.667)
IO	0.101***	0.227***	0.101***	0.228***
	(21.582)	(19.146)	(21.622)	(19.181)
Big4	0.006**	0.008	0.006**	0.008
	(2.373)	(1.250)	(2.488)	(1.235)
Firm age	-0.025***	-0.039***	-0.026***	-0.039***
	(-7.632)	(-4.537)	(-7.649)	(-4.646)
Top1	0.080***	0.182***	0.079***	0.182***
	(18.370)	(16.358)	(17.958)	(16.384)
SOE	-0.009***	-0.023***	-0.010***	-0.023***
	(-4.641)	(-4.518)	(-4.872)	(-4.499)
GDPG	0.568**	2.267***	0.544**	2.267***
	(2.139)	(3.357)	(2.049)	(3.355)
POPG	0.009	-0.021	0.013	-0.017
	(0.671)	(-0.593)	(0.958)	(-0.479)
Constant	-0.046**	-0.232***	-0.055**	-0.247***
	(-2.340)	(-4.624)	(-2.510)	(-4.940)
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	23,052	23,052	23,052	23,052
Adjusted R^2	0.542	0.327	0.542	0.326

2.4.4.4. CEO pay disparity and firm performance: does non-CEO executives' age matter?

Finally, we examine the moderating effects of non-CEO executives' age on the association between CEO pay disparity and firm performance. The age of non-CEO executives is also a very important characteristic that may affect the effectiveness of tournament incentives. Older top executives may be more conservative (Hambrick and Mason, 1984); thus, their ambition for higher positions tends to be limited. Older non-CEO executives may prefer to enjoy a relatively quiet work life until retirement rather than compete for promotion. Hence, their

incentives for promotion to the next CEO may be reduced. The positive tournament effects are expected to be mitigated if the average age of the non-CEO executive team is high.

We employ the variable *Average* to represent the average age of non-CEO executives. Specifically, we use *AveAge* as the natural logarithm of the average value of non-CEO executives' age in a sample firm. We then establish the regression model below to examine the moderating effects of non-CEO executives' age on the association between CEO pay disparity and firm performance.

$$Firm\ performance_{i,t} = \beta_0 + \beta_1 CEO\ pay\ disparity * AveAge_{i,t} + \beta_2 CEO\ pay\ disparity_{i,t}$$

$$+\beta_3 AveAge_{i,t} + \sum_k \beta_k Controls_{k,i,t} + \epsilon_{i,t} \quad (2.5)$$

where *CEO pay disparity*AveAge*$_{i,t}$ is the independent variable of interest and includes the interaction term between the CEO pay gap (*CPG*) and the average age of the non-CEO executives (*AveAge*), and the interaction term between the CEO pay slice (*CPS*) and the average age of the non-CEO executives (*AveAge*). Other variables are the same as those used in Equation (2.1) and are defined in Appendix A.

Table 2.9 reports the results from estimating Equation (2.5). Columns (1) and (2) show that the coefficients on *CPG*AveAge* are negative and significant at the 1% level, indicating that *CPG*AveAge* is negatively and significantly associated with both *ROA*[14] and *ROE*. Thus, the result suggests that non-CEO executives' age significantly weakens the positive relationship between CEO pay disparity and firm performance. However, the coefficients on *CPS*AveAge* are not statistically significant.

[14] Thanks for examiner's suggested solution, for example in Column (1), we calculate the economic significance as: The change in *ROA* relative to a one standard deviation change in *CPG* = coefficient on *CPG* (0.457) + [coefficient on *CPG*AveAge* (-0.113) * standard deviation of *AveAge* (3.817)] = 2.57%.

Table 2.9. CEO pay disparity and firm performance: does non-CEO executives' age matter?

This table reports the regression results for the effect of CEO pay disparity on firm performance concerning the average age of non-CEO executives. This table reports the coefficients of the regression as follows:

$$Firm\ performance_{i,t} = \beta_0 + \beta_1 CEO\ pay\ disparity * AveAge_{i,t} + \beta_2 CEO\ pay\ disparity_{i,t} + \beta_3 AveAge_{i,t} + \sum_k \beta_k Controls_{k,i,t} + \epsilon_{i,t}$$

$ROA_{i,t}$ and $ROE_{i,t}$ are the measures of firm performance. $CEO\ pay\ disparity * AveAge_{i,t}$ is the interaction term between $CPG_{i,t}$ and $AveAge_{,t}$, and $CPS_{i,t}$ and $AveAge_{,t}$. *CPG* is the natural logarithm of the difference between CEO pay and the median pay of all other executives in the top management team. *CPS* is the fraction of aggregate compensation of the top five members in the executive team that is captured by the CEO. *AveAge* is the natural logarithm of the average value of non-CEO executives' age in the sample firm. *Controls* are the same as in Table 2.4. All continuous variables are winsorized at the 1% level in each tail, and the detailed definitions of all variables are shown in Appendix A. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1) *ROA*	(2) *ROE*	(3) *ROA*	(4) *ROE*
*CPG*AveAge*	-0.113***	-0.136**		
	(-3.077)	(-2.122)		
CPG	0.457***	0.559***		
	(3.239)	(2.281)		
*CPS*AveAge*			0.014	0.154
			(0.283)	(1.231)
CPS			-0.029	-0.533
			(-0.153)	(-1.113)
AveAge	-0.005	-0.014	-0.022	-0.074**
	(-0.876)	(-1.429)	(-1.584)	(-2.135)
CEO gender	-0.002*	-0.004	-0.002	-0.002
	(-1.732)	(-1.456)	(-1.354)	(-0.407)
CEO age	-0.000	0.003	-0.003	-0.000
	(-0.082)	(0.819)	(-0.981)	(-0.054)
CEO duality	0.001	0.000	0.002*	0.003
	(1.048)	(0.221)	(1.831)	(1.331)
Firm size	0.003***	0.003***	0.008***	0.017***
	(6.153)	(2.721)	(11.227)	(10.117)
Leverage	-0.090***	-0.020***	-0.116***	-0.142***
	(-42.004)	(-5.445)	(-43.740)	(-20.990)
Board size	0.004**	0.003	0.006**	0.003
	(1.993)	(0.684)	(2.108)	(0.420)
Independence	-0.006	-0.008	-0.007	-0.019
	(-0.832)	(-0.690)	(-0.789)	(-0.884)
OCF	0.134***	0.210***	0.157***	0.293***
	(37.438)	(33.676)	(35.371)	(25.997)
Tang	-0.050***	-0.081***	-0.056***	-0.114***

	(-18.784)	(-17.408)	(-16.957)	(-13.628)
IO	0.093***	0.180***	0.101***	0.227***
	(24.791)	(27.314)	(21.571)	(19.121)
Big4	0.004**	0.004	0.006**	0.007
	(2.087)	(1.263)	(2.333)	(1.212)
Firm age	-0.022***	-0.034***	-0.026***	-0.039***
	(-8.321)	(-7.145)	(-7.664)	(-4.572)
Top1	0.064***	0.110***	0.081***	0.182***
	(18.270)	(17.781)	(18.432)	(16.402)
SOE	-0.008***	-0.015***	-0.009***	-0.023***
	(-5.102)	(-5.333)	(-4.583)	(-4.451)
GDPG	0.577***	1.274***	0.574**	2.279***
	(2.693)	(3.400)	(2.162)	(3.374)
POPG	0.002	-0.010	0.010	-0.018
	(0.190)	(-0.539)	(0.751)	(-0.522)
Constant	0.042	0.086*	0.029	0.029
	(1.610)	(1.905)	(0.520)	(0.206)
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	23,052	23,052	23,052	23,052
Adjusted R^2	0.588	0.460	0.541	0.326

2.4.5. 2015 "pay ceiling" regulation

In this section, we examine the effect of the 2015 "pay ceiling" regulation on CEO pay disparity and firm performance.

The Chinese government implemented the pay ceiling regulation for top executives (such as the chair of the board and the CEO) of CSOEs in 2014. LSOEs are also required by the central government to follow this executive regulation, which was officially implemented on 1 January 2015. The regulation serves primarily to set a cap on the ratio of the total pay of top executives to the average salary of employees to limit excessive executive compensation. In detail, the compensation structure includes basic annual salary, performance-based annual salary, and term incentive bonus. All three of these components of top manager pay are respectively restricted by this regulation.[15] The 2015 pay ceiling regulation is expected to trim

[15] The maximum allowable basic annual salary is twice the average annual wage of non-executive employees in SOEs, calculated based on the previous year's payments. The annual salary for performance shall not exceed

down the executive–worker pay ratio to approximately eight. Therefore, this regulation is expected to play a significant role in affecting CEO pay and CEO pay disparity and may also influence the effectiveness of tournament incentives for non-CEO executives.

2.4.5.1. The effect of the 2015 "pay ceiling" regulation on CEO pay and CEO pay disparity

First, we examine whether the 2015 "pay ceiling" regulation significantly reduces CEO pay and CEO pay disparity. To test the effectiveness of the executive pay ceiling regulation, we employ the following regression model:

$$CEO\ pay\ /\ CEO\ pay\ disparity_{i,t} = \beta_0 + \beta_1 SOE_i * Post_t + \beta_2 SOE_i + \beta_3 Post_t + \sum_k \gamma_k Control_{k,i,t} + \varepsilon_{i,t} \quad (2.6)$$

where *CEO pay* is the natural logarithm of a CEO's total compensation. *CEO pay disparity* includes *CPG* and *CPS*. SOE_i is a dummy variable that equals 1 if the ultimate controller of the firm is an SOE or government agency and 0 otherwise. $Post_t$ is a dummy variable that equals 1 for the period from 2015 to 2018 and 0 otherwise. SOE_i*$Post_t$ is the independent variable of interest and includes the interaction term between SOE_i and $Post_t$. Other variables are consistent with those used in Equation (2.1) and are defined in Appendix A.

Table 2.10 shows that the coefficients on *SOE*Post* are all negative and significant at the 1% level. These results indicate that the 2015 "pay ceiling" regulation significantly reduces CEO pay and pay disparity in SOEs. [16]

twice the basic annual salary. The term incentive bonus within an executive's tenure should not exceed 30% of the total annual salary.

[16] This result is consistent with the finding of Bai et al. (2019) that the compensation of CEOs in SOEs decreased significantly after the implementation of the 2015 "pay ceiling" regulation.

Table 2.10. The effect of the 2015 "pay ceiling" regulation on CEO pay and pay disparity
This table reports the regression results based on Equation (2.6). *CEO pay* is the natural logarithm of CEO's total compensation. *CPS* and *CPG* are the same as Table 2.4. *SOE* is a dummy variable that equals one if the ultimate controller of the firm is an SOE or government agency and zero otherwise. *Post* is a dummy variable that equals one for the period from 2015 to 2018 and zero otherwise. Appendix A presents the detailed variable definitions. All continuous variables are winsorized at the 1% level in each tail, and the detailed definitions of all variables are shown in Appendix A. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1) *CEO pay*	(2) *CPG*	(3) *CPS*
*SOE*Post*	-0.152***	-0.009***	-0.005***
	(-10.182)	(-4.535)	(-2.584)
SOE	-0.137***	-0.004	-0.009***
	(-5.211)	(-1.074)	(-2.900)
Post	1.269***	0.007	0.000
	(26.191)	(1.071)	(0.040)
CEO gender	0.049**	0.009***	0.001
	(2.228)	(3.048)	(0.244)
CEO age	0.474***	0.068***	0.065***
	(12.803)	(13.164)	(14.802)
CEO duality	0.051***	0.003*	0.009***
	(4.201)	(1.758)	(6.223)
Firm size	0.171***	0.000	-0.005***
	(20.009)	(0.152)	(-4.760)
Leverage	-0.337***	-0.018***	-0.012***
	(-10.032)	(-3.832)	(-2.980)
Board size	0.141***	0.002	-0.005
	(4.092)	(0.367)	(-1.306)
Independence	0.039	-0.029*	-0.011
	(0.368)	(-1.917)	(-0.856)
OCF	0.431***	0.015**	0.017**
	(7.713)	(1.975)	(2.539)
Tang	-0.362***	-0.012**	-0.016***
	(-8.690)	(-2.025)	(-3.201)
IO	0.544***	0.016*	0.016**
	(9.237)	(1.882)	(2.219)
Big4	0.124***	0.001	-0.000
	(4.063)	(0.321)	(-0.051)
Firm age	-0.246***	-0.019***	-0.015***
	(-5.789)	(-3.238)	(-2.960)
Top1	-0.042	-0.008	-0.001
	(-0.767)	(-1.041)	(-0.183)
GDPG	5.484	0.868*	0.900**
	(1.633)	(1.849)	(2.259)
POPG	0.502***	0.078***	0.052**
	(2.928)	(3.240)	(2.536)
Constant	7.128***	-0.123***	0.160***
	(28.426)	(-3.499)	(5.378)
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	23,052	23,052	23,052
Adjusted R^2	0.693	0.212	0.404

2.4.5.2. The effect of the 2015 "pay ceiling" regulation on firm performance

As documented before, a large CEO pay disparity can provide tournament incentives for non-CEO executives to make them work harder, leading to enhanced firm performance. Since the 2015 executive pay ceiling regulation has been shown to reduce CEO pay disparity, it is of interest to study the influence of this regulation on the positive promotion-based tournament effects in SOEs. Therefore, we establish the regression model below:

$$\begin{aligned} Firm\ performance_{i,t} = {} & \beta_0 + \beta_1 SOE_i * Post_t * CEO\ pay\ disparity_{i,t} + \beta_2 SOE_i * Post_t + \\ & \beta_3 SOE_i * CEO\ pay\ disparity_{i,t} + \beta_4 Post_t * CEO\ pay\ disparity_{i,t} \\ & + \beta_6 SOE_i + \beta_7 Post_t + \beta_8 CEO\ pay\ disparity_{i,t} \\ & + \sum_k \gamma_k Control_{k,i,t} + \varepsilon_{i,t} \end{aligned} \quad (2.7)$$

where *Firm performance* includes *ROA* and *ROE*. *CEO pay disparity* includes *CPG* and *CPS*. SOE_i is a dummy variable that equals 1 if the ultimate controller of a firm is an SOE or government agency and 0 otherwise. $Post_t$ is a dummy variable that equals 1 for the period from 2015 to 2018 and 0 otherwise. SOE_i*$Post_t$*$CEO\ pay\ disparity_{i,t}$ is the independent variable of interest and includes the interaction term between SOE_i, $Post_t$ and $CEO\ pay\ disparity_{i,t}$. Other variables are consistent with those used in Equation (2.1) and are defined in Appendix A.

Table 2.11 shows that the coefficients on *SOE*Post*CPG*[17] and *SOE*Post*CPS* are all negative and significant at least at the 10% level. These results suggest that the 2015 "pay ceiling" regulation significantly weakens the positive association between CEO pay disparity and firm performance in SOEs. Therefore, this regulation mitigates the effectiveness of the tournament incentives for non-CEO executives in SOEs because CEO pay disparity is reduced after its implementation.

[17] We follow Bai et al. (2019) to interpret economic significance. For example in Column (1), the impact of this regulation on firm performance is economically significant, with *ROA* decreasing by 6.05% [0.027 (coefficient on *SOE*Post*CPG*) * 0.074 (standard deviation of *CPG* in SOEs) / 0.033 (mean value of *ROA* in SOEs)] after this regulation.

Table 2.11. The effect of 2015 "pay ceiling" regulation on firm performance

This table reports the regression results based on Equation (2.7). *CPS* and *CPG* are the same as Table 2.4. *SOE*Post*CPG* and *SOE*Post*CPS* are our main interests in this regression model. *SOE*Post*CPG* is the interaction term between *SOE, Post,* and *CPG*. *SOE*Post*CPS* is the interaction term between *SOE, Post,* and *CPS*. *SOE* is a dummy variable that equals one if the ultimate controller of the firm is an SOE or government agency and zero otherwise. *Post* is a dummy variable that equals one for the period from 2015 to 2018 and zero otherwise. Appendix A presents the detailed variable definitions. All continuous variables are winsorized at the 1% level in each tail, and the detailed definitions of all variables are shown in Appendix A. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
	ROA	*ROE*	*ROA*	*ROE*
*SOE*Post*CPG*	-0.027**	-0.046*		
	(-2.005)	(-1.719)		
*SOE*Post*CPS*			-0.050***	-0.087***
			(-3.166)	(-2.774)
*SOE*Post*	0.007***	0.009***	0.017***	0.026***
	(4.367)	(2.779)	(4.271)	(3.310)
*SOE*CPG*	0.008	0.027		
	(0.783)	(1.375)		
*Post*CPG*	0.017*	0.025		
	(1.762)	(1.312)		
*SOE*CPS*			0.024**	0.054**
			(2.169)	(2.491)
*Post*CPS*			0.031***	0.050***
			(3.218)	(2.612)
CPG	0.021***	0.036**		
	(2.762)	(2.427)		
CPS			0.008	0.014
			(1.072)	(0.949)
SOE	-0.011***	-0.023***	-0.016***	-0.034***
	(-5.488)	(-5.657)	(-4.966)	(-5.174)
Post	0.009**	0.019***	0.003	0.010
	(2.406)	(2.626)	(0.676)	(1.113)
CEO gender	-0.002	-0.003	-0.002	-0.003
	(-1.497)	(-1.130)	(-1.364)	(-1.010)
CEO age	-0.002	0.000	-0.002	0.001
	(-0.706)	(0.059)	(-0.584)	(0.189)
CEO duality	0.001	0.001	0.001	0.001
	(1.385)	(0.729)	(1.303)	(0.643)
Firm size	0.005***	0.007***	0.005***	0.007***
	(8.510)	(5.791)	(8.700)	(5.980)
Leverage	-0.100***	-0.056***	-0.100***	-0.056***
	(-42.092)	(-11.808)	(-42.163)	(-11.894)
Board size	0.005**	0.003	0.005**	0.003
	(2.016)	(0.589)	(2.144)	(0.697)
Independence	-0.008	-0.015	-0.008	-0.016
	(-0.919)	(-0.905)	(-0.955)	(-0.943)
OCF	0.153***	0.260***	0.153***	0.260***

	(37.243)	(31.768)	(37.231)	(31.756)
Tang	-0.055***	-0.102***	-0.055***	-0.102***
	(-18.445)	(-17.218)	(-18.435)	(-17.208)
IO	0.100***	0.207***	0.100***	0.207***
	(23.557)	(24.340)	(23.524)	(24.315)
Big4	0.005**	0.004	0.005**	0.004
	(2.352)	(1.040)	(2.330)	(1.034)
Firm age	-0.024***	-0.037***	-0.024***	-0.038***
	(-7.384)	(-5.757)	(-7.440)	(-5.829)
Top1	0.070***	0.131***	0.069***	0.131***
	(17.698)	(16.754)	(17.642)	(16.688)
GDPG	0.674***	1.596***	0.681***	1.607***
	(2.872)	(3.409)	(2.899)	(3.429)
POPG	0.006	-0.015	0.007	-0.013
	(0.531)	(-0.610)	(0.579)	(-0.559)
Constant	-0.004	-0.033	-0.008	-0.040
	(-0.199)	(-0.903)	(-0.420)	(-1.111)
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	23,052	23,052	23,052	23,052
Adjusted R^2	0.571	0.413	0.571	0.413

2.4.6. Endogeneity

It is a challenge to establish the causal relationship between CEO pay disparity and firm performance because of the endogeneity problems. The documented results may be affected by selection bias and omitted variables or may be driven by reverse causality. For example, reverse causality may cause an issue in determining the direction of the positive association between CEO pay disparity and firm performance. Palia (2001) suggests that managerial compensation and firm performance are jointly determined. Thus, a firm's performance might impact CEO pay disparity rather than CEO pay disparity affecting firm performance. To address these concerns, we use three approaches for robustness checks: a Heckman two-stage model, a PSM analysis and IV estimation. *CPG* is mainly used to represent CEO pay disparity in this section for simplicity.

2.4.6.1. PSM analysis

Following Sun et al. (2019) and Pathan et al. (2022), we further employ PSM analysis to address the concern that the baseline results are subject to sample selection bias. The aim of PSM is to produce two statistically similar samples, one with a high pay disparity and one with a low pay disparity. Firm-year observations are divided into treatment and control groups based on the degree of pay disparity. Specifically, a firm-year observation is determined to be part of the treatment group if its CEO pay disparity is above the 50th percentile of the pay disparity of that year. A binary variable *CPG50* is constructed and equals 1 if a firm's *CPG* is above the median value of *CPG* in our full sample and 0 otherwise. We first estimate a probit model to predict the likelihood that firms have a higher CEO pay disparity (*CPG50*) by including all of the control variables from Equation (2.1). PSM aims to produce two statistically similar samples, with and without a large CEO pay disparity. We exclude matched peers with propensity score differences larger than 1% to improve matching accuracy. We then re-estimate Equation (2.1) using the matched sample.

Table 2.12 reports the regression results. Panel A reports the results from a probit model with a binary *CPG50* dummy using the full sample. Firms with an older CEO or a CEO who also holds a chairman position tend to have large pay disparity. Thus, firms with a larger size, lower debt ratio, higher levels of institutional ownership, older firm age and non-SOEs are more likely to have a large CEO pay disparity. Panel B shows the regression result of the PSM sample. The coefficients on *CPG* remain positive and significant at the 1% level in Columns (2) and (3). Panel C reports the results of covariate balance checks on the mean difference of the covariates in the propensity-matched sample. The differences in means between the covariates of the treated and control groups are insignificant, suggesting that our PSM analysis is successful.

Overall, the results suggest that the documented positive relation between CEO pay disparity and firm performance is robust after mitigating the sample selection concern.[18]

Table 2.12. PSM analysis

This table reports the regression results using a PSM procedure. Panel A reports the results from a probit model with a binary *CPG50* dummy using the full sample after controlling for industry and year fixed effects with standard errors clustered at the firm level. Panel B presents the regression results using the propensity-matched sample. Panel C reports the results of covariate balance checks on the mean difference of the covariates in the propensity-matched sample after controlling for firm and year fixed effects. Variable definitions are provided in Appendix A. All the continuous variables are winsorized at the 1% and 99% levels. The regressions control for the industry- and year-fixed effects. The t-statistics are reported in parentheses with standard errors clustered at the firm level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A		Panel B	
	CPG50	*ROA*	*ROE*
	(1)	(2)	(3)
CPG		0.029***	0.066***
		(6.302)	(5.884)
CEO gender	-0.016	0.000	0.001
	(-0.244)	(0.100)	(0.269)
CEO age	0.711***	-0.001	-0.001
	(6.042)	(-0.325)	(-0.085)
CEO duality	0.186***	0.002**	0.006**
	(4.872)	(2.100)	(2.296)
Firm size	0.180***	0.006***	0.015***
	(10.384)	(7.137)	(7.057)
Leverage	-0.451***	-0.108***	-0.120***
	(-5.014)	(-33.497)	(-15.159)
Board size	0.001	0.005	0.003
	(0.007)	(1.554)	(0.385)
Independence	-0.701**	-0.002	0.002
	(-2.201)	(-0.155)	(0.091)
OCF	1.310***	0.150***	0.273***
	(7.546)	(28.467)	(21.146)
Tang	-0.487***	-0.057***	-0.114***
	(-4.365)	(-13.877)	(-11.342)
IO	1.048***	0.101***	0.229***
	(5.430)	(18.323)	(16.944)
Big4	0.076	0.006*	0.006
	(1.062)	(1.956)	(0.834)
Firm age	0.160***	-0.022***	-0.026***

[18] The PSM regression results remain robust when using the CPS to measure CEO pay disparity.

	(3.235)	(-5.402)	(-2.665)
Top1	-0.463***	0.088***	0.210***
	(-4.011)	(16.034)	(15.568)
SOE	-0.361***	-0.004	-0.018***
	(-8.696)	(-1.575)	(-2.651)
GDPG	-31.754***	1.060***	3.039***
	(-3.065)	(3.278)	(3.837)
POPG	2.817***	0.013	0.005
	(5.229)	(0.759)	(0.107)
Constant	-6.929***	-0.046*	-0.254***
	(-11.523)	(-1.919)	(-4.288)
Industry FE	Yes	No	No
Year FE	Yes	Yes	Yes
Firm FE	No	Yes	Yes
Observations	23,052	17,102	17,102
Adjusted R^2		0.529	0.326
Pseudo R^2	0.081		

Panel C	Firms with higher *CPG*	Firms with lower *CPG*	Diff. in means (t-stat)	Standardized Bias (%)
CEO gender	0.944	0.944	0.000	-0.10
			(–0.03)	
CEO age	3.876	3.877	–0.001	-0.30
			(–0.18)	
CEO duality	0.245	0.248	-0.003	-0.60
			(0.39)	
Firm size	21.981	22.007	-0.026	-2.10
			(-1.37)	
Leverage	0.429	0.429	0.000	-0.20
			(-0.11)	
Board size	2.162	2.162	0.000	0.40
			(0.26)	
Independence	0.370	0.370	0.000	-1.00
			(-0.65)	
OCF	0.044	0.044	0.000	0.40
			(0.27)	
Tang	0.228	0.228	0.000	0.00
			(0.03)	
IO	0.062	0.063	–0.001	-1.70
			(–1.12)	
Big4	0.053	0.055	-0.002	-0.60
			(-0.37)	
Firm age	2.701	2.704	-0.003	-0.70
			(-0.48)	

Top1	0.360	0.359	0.001	0.40
			(0.24)	
SOE	0.435	0.430	0.005	1.10
			(0.69)	
GDPG	0.004	0.004	0.000	1.10
			(0.75)	
POPG	0.011	0.010	0.001	0.10
			(0.04)	

2.4.6.2. Heckman two-stage model

To address sample selection bias, we adopt a Heckman two-stage model (Heckman, 1979) following existing studies such as Zhong et al. (2021), Chou et al. (2022) and Zhang et al. (2022a). In the first step, we estimate a probit model with a binary *CPG50* as the dependent variable to predict the likelihood of a firm having a large CEO pay gap. We then estimate the inverse Mills ratio (*Mills*). *Mills* is expected to capture all unobserved differences between the treatment and control groups due to selection. In the second stage, we include *Mills* as an additional independent variable in the baseline regression (Equation (1)) to control for the potential sample selection bias.

Table 2.13 reports the results of the Heckman two-stage analysis. The results of the first-step regression show that firms with a larger size, higher levels of institutional ownership and non-SOEs are more likely to have a large CEO pay disparity. The results of the second-step regressions show that the coefficients on *CPG* remain positive and significant at the 1% level when the inverse Mills ratio is controlled for. These results suggest that the positive relationship between CEO pay disparity and firm performance is valid.[19]

[19] The Heckman two-stage regression results remain robust when using the CPS to measure CEO pay disparity.

Table 2.13. Heckman two-stage analysis

This table reports the regression results using a Heckman two-stage model. Panel A reports the results from a probit model with a binary *CPG50* dummy using the full sample. We estimate the inverse Mills ratio (*Mills*), and in the second stage, include *Mills* as an additional independent variable in the baseline regression (Eq. (1)). Panel B presents the regression results after controlling for *Mills*. Variable definitions are provided in Appendix A. All the continuous variables are winsorized at the 1% and 99% levels. The regression in Panel A controls for the industry- and year-fixed effects with standard errors clustered at the firm level. The regressions in Panel B control for firm- and year- fixed effects. The t-statistics are reported in parentheses *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A		Panel B	
	CPG50	*ROA*	*ROE*
	(1)	(2)	(3)
CPG		0.032***	0.074***
		(7.834)	(7.211)
CEO gender	-0.016	-0.008**	-0.025**
	(-0.244)	(-1.970)	(-2.380)
CEO age	0.711***	-0.003	-0.002
	(6.042)	(-1.457)	(-0.411)
CEO duality	0.186***	0.001	-0.002
	(4.872)	(0.758)	(-0.582)
Firm size	0.180***	0.006***	0.012***
	(10.384)	(6.576)	(4.707)
Leverage	-0.451***	-0.113***	-0.127***
	(-5.014)	(-34.717)	(-15.267)
Board size	0.001	0.005**	0.002
	(0.007)	(2.006)	(0.339)
Independence	-0.701**	-0.003	0.003
	(-2.201)	(-0.290)	(0.117)
OCF	1.310***	0.149***	0.251***
	(7.546)	(21.408)	(14.222)
Tang	-0.487***	-0.053***	-0.098***
	(-4.365)	(-13.328)	(-9.678)
IO	1.048***	0.094***	0.194***
	(5.430)	(14.820)	(11.961)
Big4	0.076	0.005**	0.006
	(1.062)	(2.181)	(0.909)
Firm age	0.160***	-0.027***	-0.046***
	(3.235)	(-7.878)	(-5.265)
Top1	-0.463***	0.083***	0.196***
	(-4.011)	(17.574)	(16.308)
SOE	-0.361***	-0.007***	-0.012*
	(-8.696)	(-2.893)	(-1.831)
GDPG	-31.754***	0.756**	3.261***
	(-3.065)	(2.555)	(4.331)
POPG	2.817***	-0.009	-0.116**
	(5.229)	(-0.483)	(-2.478)
Mills		-0.035	-0.187***
		(-1.450)	(-3.024)
Constant	-6.929***	0.017	0.074

	(-11.523)	(0.386)	(0.670)
Industry FE	Yes	No	No
Year FE	Yes	Yes	Yes
Firm FE	No	Yes	Yes
Observations	23,052	23,052	23,052
Adjusted R^2		0.542	0.327
Pseudo R^2	0.081		

2.4.6.3. IV estimation

We next address the endogeneity concern by using IV estimation. Following prior studies (Kale., 2009; Kini and Williams, 2012; Hu et al., 2013; Kubick and Masli, 2016; Shen and Zhang, 2018; Luong et al., 2022), we construct the first IV*Median-CPG*, which is the median value of *CPG* in the same industry and year and can capture the industry pay gap. Shen and Zhang (2018) document that an individual firm is likely to be a "compensation-taker". That is, a firm likely adjusts its executive pay when peer firms change executive compensation (DiPrete et al., 2010). *CPG* of a firm is expected to be higher if said firm operates in an industry with a larger pay gap. Inspired by Jin et al. (2023), we construct the second IV *Temple* to represent the effect of Confucian culture on listed firms. *Temple* measures the number of national Confucian temples in each province. Following Du (2016) and Li et al. (2022), we manually collect the location of national Confucian temples at http://www.chinakongmiao.org/index.aspx. The number of nationally-famous Confucian temples where listed companies are headquartered can be used to proxy for a firm's exposure to Confucianism (Du, 2016; Li et al., 2022; Jin et al., 2023). A higher *Temple* value indicates a greater influence of Confucianism on a firm. According to Jin et al. (2023), firms that are exposed to stronger Confucianism tend to offer lower CEO compensation and have a smaller

CEO pay gap.[20] Thus, firms located in a province with more Confucian temples are expected to be less likely to have a higher CEO pay disparity. However, Confucian culture (*Temple*) is unlikely to affect firm performance directly.

Table 2.14 reports the results of the IV estimation. In the first-stage analysis, *Median-CPG* and *Temple* are regressed on *CPG* with the same control variables used in the baseline regression. The coefficient on *Median-CPG* (*Temple*) is significantly positive (negative). The results are consistent with our expectation that firms operating in industries with a higher CEO pay gap are more likely to have a larger CEO pay gap. In addition, firms with greater exposure to Confucianism tend to have a lower CEO pay gap. In the second-stage analysis, the fitted value generated from the first-stage estimation is used as the IV of the CEO pay gap (*CPG*). The positive coefficients on *CPG* in the second-stage estimation are significant at least at the 5% level, confirming the positive association between CEO pay disparity and firm performance. The F stat value equals 14.63 in the first stage, greater than 10, indicating that the IVs are not weak. To ensure the validity of the instrumental variables, we first conduct the weak identification test. The Cragg-Donald Wald F statistic is 20.922 which provides evidence that rejects the hypothesis that our instruments are weak and invalid. In order to ensure the instrumental variables selected in this study are exogenous, we then perform over-identification test. The p values of Sargan statistics are 0.641 and 0.123, which are greater than 0.1, failing to reject the null-hypothesis that all instrumental variables are exogenous, suggesting that our instrumental variables are valid. Overall, the results in Table 2.14 confirm that CEO pay disparity promotes firm performance[21].

[20] This is because of the core values of moderatism, collectivism, and patriarchalism rooted in the Confucian culture.

[21] The results of IV test still hold when the CPS is used as the measure of CEO pay disparity.

Table 2.14. IV estimation

This table presents the impact of CEO pay disparity on firm performance using instrumental variable estimation. We use *Median-CPG* and *Temple* as the instrumental variables of CEO pay disparity. In the first-stage analysis, we regress *Median-CPG* and *Temple* on CEO pay disparity measure (*CPG*) with other independent variables are the same as in Table 2.4. In the second-stage analysis, we use the fitted values generated from the first-stage estimation as the instrumental variable for CEO pay disparity and rerun the baseline regression. Appendix A presents the detailed variable definitions. All continuous variables are winsorized at the 1% level in each tail, and the detailed definitions of all variables are shown in Appendix A. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	First stage	Second stage	
	CPG	*ROA*	*ROE*
	(1)	(2)	(3)
Median-CPG	1.125***		
	(6.110)		
Temple	-0.005**		
	(-2.187)		
CPG		0.348***	0.566**
		(3.466)	(2.404)
CEO gender	0.010***	-0.006***	-0.007
	(3.160)	(-2.598)	(-1.428)
CEO age	0.069***	-0.026***	-0.036**
	(13.264)	(-3.345)	(-2.016)
CEO duality	0.003	0.001	0.002
	(1.571)	(0.918)	(0.880)
Firm size	0.001	0.007***	0.016***
	(0.874)	(9.062)	(8.993)
Leverage	-0.017***	-0.111***	-0.133***
	(-3.610)	(-31.678)	(-16.203)
Board size	0.001	0.005	0.001
	(0.309)	(1.581)	(0.196)
Independence	-0.028*	0.003	-0.004
	(-1.882)	(0.276)	(-0.177)
OCF	0.015**	0.152***	0.285***
	(1.979)	(28.513)	(22.828)
Tang	-0.010*	-0.053***	-0.109***
	(-1.784)	(-13.349)	(-11.813)
IO	0.017**	0.095***	0.219***
	(2.021)	(17.055)	(16.672)
Big4	0.001	0.005*	0.007
	(0.181)	(1.862)	(1.040)
Firm age	-0.015**	-0.021***	-0.032***
	(-2.533)	(-5.123)	(-3.286)
Top1	-0.010	0.084***	0.188***
	(-1.355)	(16.433)	(15.634)
SOE	-0.006*	-0.007***	-0.020***

	(-1.750)	(-2.972)	(-3.474)
GDPG	0.968**	0.249	1.758**
	(2.068)	(0.777)	(2.341)
POPG	0.081***	-0.017	-0.061
	(3.392)	(-0.945)	(-1.474)
Constant	-0.247***	0.007	-0.151**
	(-6.034)	(0.289)	(-2.532)
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	23,052	23,052	23,052
Adjusted R^2	0.213	0.541	0.325
Cragg-Donald Wald F statistic	20.922		
Sargan statistic		0.218	2.385
p-value of Sargan statistic		0.641	0.123

2.5. Conclusion

In this study, we investigate the influence of CEO pay disparity on firm performance. Using a sample of 3,316 Chinese listed firms from 2005 to 2018, we find that CEO pay disparity is significantly associated with better firm performance. Similar findings are demonstrated after addressing the endogeneity issues by employing PSM analysis, a Heckman two-stage model, and IV estimation. The empirical results support the rank-order tournament theory that a large CEO pay disparity provides non-CEO executives with strong tournament incentives to perform well, thereby leading to enhanced firm performance. We then find that the positive tournament effect of CEO pay disparity exists in both SOEs and private firms. Furthermore, we show evidence that the positive tournament effect is subject to the characteristics of CEOs and non-CEO executives. For example, the effectiveness of tournament incentives tends to be weaker in firms with 1) politically connected CEOs, 2) CEOs with longer tenures, 3) more female non-CEO executives, 4) an older non-CEO executive team. Politically

connected CEOs tend to entrench themselves and face lower replacement profitability, thus reducing the chances of non-CEO executives being promoted to the next CEO. CEOs with longer tenures have more power and they are more likely to be insulated from the threat of dismissal, thereby also reducing the promotion opportunities of non-CEO executives. In addition, female non-CEO executives are less motivated by tournament incentives because it is difficult for them to be promoted to the CEO position in Chinese listed firms. Older non-CEO executives are also less sensitive to tournament incentives since they tend to be less ambitious.

We also examine the influence of the 2015 "pay ceiling" regulation on CEO pay disparity and firm performance and find that this regulation significantly reduces CEO pay and CEO pay disparity. In addition, this regulation significantly weakens the positive effect of CEO pay disparity on firm performance in SOEs.

Overall, the tournament theory applies to China's listed firms, and a large CEO pay disparity is beneficial to firm performance. The CEO pay disparity can be used as an effective corporate governance mechanism to build a skilled top executive team and enhance firm performance. Although a pay ceiling regulation can promote social fairness, policy-makers should thoroughly consider other side effects when limiting the compensation of top executives in SOEs.

2.6. Appendix

Appendix A. Variable definitions

This appendix reports the definition of the main variables used in this study.

ROA	Net income divided by total assets.
ROE	Net income divided by total equity.
CPG	The gap between a CEO's total compensation and the median total compensation of non-CEO top executives (i.e., VP, CFO, COO). The inverse hyperbolic sine transformation is used to address the issue of the zero and negative pay gap.
CPS	The ratio of the CEO total compensation to the aggregate total compensation of the top five executives including the CEO.
CPG50	A dummy variable that equals one if a firm's *CPG* is above the median value of *CPG* in our full sample and zero otherwise.
CEO gender	A dummy variable that equals one if the CEO is male and zero otherwise.
CEO age	The natural logarithm of a CEO's age.
CEO duality	A dummy variable that equals one if the CEO and chairman positions are held by the same person and zero otherwise.
Firm size	The natural logarithm of total assets.
Leverage	The book value of total debt divided by the book value of total assets.
Board size	The natural logarithm of the total number of directors on the board.
Independence	The proportion of independent directors to total number of directors on the board.
OCF	The ratio of net cash flow from operations to total assets.
Tang	Tangible assets over total assets.
IO	The percentage of shares held by institutional investors.
Big4	A dummy variable that equals one if the firm hires an international Big4 auditor and zero otherwise.
Firm age	The natural logarithm of one plus the number of years since a firm's establishment.
Top1	Percentage of shares owned by the largest shareholder.
SOE	A dummy variable that equals one if the ultimate controller of a firm is an SOE or government agency and zero otherwise.
GDPG	The annual provincial GDP growth rate.
POPG	The annual provincial population growth rate.
PC	A dummy variable that equals one if the CEO is politically connected and zero otherwise.
AveAge	The natural logarithm of the average value of non-CEO executives' age in the sample firm.

Tenure	The natural logarithm of the number of years that a CEO has served as CEO in a sample firm.
Female	The female ratio of non-CEO executives of the sample firm.
Post	A dummy variable that equals one for the period from 2015 to 2018 and zero otherwise.
Median-CPG	The median value of *CPG* in the same industry and year.
Temple	The number of national Confucian Temples in each province.

CHAPTER THREE ESSAY TWO

CEO early-life experience and its effect on accounting conservatism

Abstract

Using China's Cultural Revolution (1966–1976) as a shock to risk attitude, this study investigates the influence of CEOs' early-life experience on corporate accounting conservatism. We find that CEOs who experienced the Cultural Revolution in their early life are more risk-averse and conservative, and thereby are associated with a higher level of accounting conservatism. Such a positive relationship is more pronounced in provinces with higher political risks, e.g., where the provincial leadership changes and where high-profile provincial bureaucratic corruption cases occur. Also, the positive effect of CEOs' early-life experience is stronger in SOEs where CEOs' political career concerns are more pronounced. The results indicate that political influence moderates the impact of CEOs' early-life experience on corporate accounting conservatism. Additional analysis suggests that CEOs with early-life experience are more likely to increase firm's provisions for liabilities and decrease accrual-based earnings management. Our results add new evidence to support the upper echelons theory and imprinting theory by highlighting the influence of CEOs' early-life experience in shaping corporate financial reporting policies.

Keywords: CEO early-life experience; China's Cultural Revolution; Upper echelon theory; Imprinting theory; Accounting conservatism

3.1. Introduction

According to the upper echelons theory (Hambrick, 2007; Hambrick and Mason, 1984), CEOs' characteristics, such as early-life experiences, can greatly influence managerial decisions and firm outcomes. Prior literature has examined the effect of CEOs' personal experiences, such as military experiences (Benmelech and Frydman, 2015; Law and Mills, 2017), working experiences (Custódio and Metzger, 2014; Quan et al., 2021), and flying experiences (Cain and McKeon, 2016), on corporate risk-taking policies and behaviour. We employ China's Cultural Revolution as a risk attitude–shocking event to examine the effect of CEOs' early-life experience on corporate financial reporting policy decisions. The Cultural Revolution was an influential political upheaval filled with political uncertainties that took place in Mainland China during the period 1966–1976 (MacFarquhar and Schoenhals, 2009; MacFarquhar et al., 1991). The social mobilization that resulted from this political movement ran deep and, during its worst period, affected nearly every Chinese citizen to some extent or another (Walder, 2015).

Imprinting theory documents how some important events that happened in a CEO's childhood and adolescence will have a long-lasting and significant effect on their perception of risk and decision-making (Marquis and Tilcsik, 2013). In particular, the imprints generated from traumatic early-life experiences are more enduring and pronounced (Parry and Chesler, 2005; Cryder et al., 2006). Thus, past traumatic life experiences generate long-term imprints that affect CEOs' future risk preferences and decision-making. Recent studies employ external non-human events as a proxy for CEOs' early-life experiences, e.g., war (Malmendier et al., 2011; Choi and Jung, 2021; Choi et al., 2021), the Great Depression (Malmendier and Nagel, 2011; Malmendier et al., 2011), and disaster (Bernile et al., 2017; Chen et al., 2021; Tian et al., 2023), and it is found that those events have a significant influence on CEOs' risk attitudes and firm risk-taking behaviour. For example, CEOs who experienced the Korean War in early

life are associated with more conservative managerial policies (Choi and Jung, 2021; Choi et al., 2021). Malmendier et al. (2011) find that CEOs who grew up during the Great Depression are averse to debt and prefer excessive internal financing. Chen et al. (2021) indicate that CEOs with early-life natural disaster experiences are associated with higher firm stock price crash risk. The political movement known as China's Cultural Revolution also had a profound effect.[22] People who lived through that period often faced significant uncertainty and insecurity, which have had a long-lasting impact on their attitudes towards risk-taking. Individuals exposed to adverse early-life experience exhibit higher risk aversion and higher sensitivity to potential losses (Callen et al., 2014; Kim and Lee, 2014). It is expected that CEOs with the early-life experience would be more risk-averse and have a higher perception of risk in the environment. Therefore, CEOs who experienced the Cultural Revolution in their early life tend to exhibit more risk-averse financial reporting behaviours.

Moreover, since early-life Cultural Revolution experience may make CEOs more risk-averse and cautious in decision-making when facing strong political influence, we would expect political influence to moderate the relation between CEOs' early-life experience and accounting conservatism. Governments can exert strong political influence on top executives, which significantly affects managerial behaviours and firm decision-making (An et al, 2016; Gu et al., 2019). Political influence includes macro-level political environments such as shifts in political power and changes in regulations and policies, and micro-level firm-specific political influences such as government control and intervention (Xu et al., 2016; Hao and Lu, 2018; Gu et al., 2019). It is essential that Chinese firms deal with politicians and respond to the associated political risk because high-profile provincial bureaucrats implement policies and control a huge amount of government resources. For example, cases of both government

[22] Nearly 30 million people experienced political persecution to some extent (Walder, 2015).

official turnover and high-profile corruption can lead to heightened political uncertainty, which results in more political risk (An et al., 2016; Xie et al., 2022). It is expected that CEOs with early-life Cultural Revolution experience would tend to be more risk-averse when facing higher political risk. In addition, in agency theory, career interest is the most crucial aspect of executives' self-interest (Hu and Xu, 2022). Particularly in the Chinese setting, political career concerns significantly influence managerial behaviour. Chen et al. (2018a) document that SOE managers are more cautious and risk-averse when managing firms since they need to keep their current rank and seek promotion within the SOE system. Thus, CEOs in SOEs are expected to be more risk-averse and exhibit more conservative financial reporting behaviour. Therefore, we expect that CEOs who experienced the Cultural Revolution in their early life would be more risk-averse, thus adopting conservative corporate financial reporting policies, especially in an environment with stronger political influence.

Accounting conservatism is a basic accounting convention and an important feature of accounting information quality. The main explanations for accounting conservatism are contracting, shareholder litigation, taxation, and accounting regulation (Watts, 2003). Accounting conservatism is an efficient contracting mechanism that can monitor management's investment decisions as well as inhibit management's ability and incentive to inflate earnings (Ball, 2001; Watts, 2003). Accounting conservatism can protect the downward risk of stakeholders in bankruptcy (Balakrishnan et al., 2016). Positive accounting theory suggests that conservatism financial reporting is an efficient governance mechanism to mitigate information asymmetries and agency problems (Watts, 2003; Lafond and Watts, 2008; Francis et al., 2013). Based on upper echelons and imprinting theories, CEOs with an early-life adverse experience can be more sensitized to the consequences of the downside risk; thus, such risk-

averse attitudes can make them reflect "bad news" more quickly than "good news".[23] Therefore, we propose that CEOs with early-life Cultural Revolution experience are associated with a higher level of corporate accounting conservatism. In particular, this relation could be more pronounced in an environment with stronger political influence.

Using a large sample of Chinese A-share firms (23,018 firm-year observations) listed on the Shanghai and Shenzhen Stock Exchanges for the period 2007 to 2019, we find that CEOs' early-life experience are significantly and positively associated with corporate accounting conservatism. Our finding indicates that CEOs who experienced the Cultural Revolution in their early life are more conservative and risk-averse, thus exhibiting a higher demand for conservative financial reporting. We find that such a positive association is more pronounced in environments with stronger political uncertainties, e.g., in regions where the provincial leadership changes, and where high-profile corruption cases occur. In addition, the CEO's early-life experience effect is stronger in SOEs in which managers' political career concerns are more pronounced. Those results indicate that political influence can moderate the positive association between CEOs' early-life experience and accounting conservatism.

Multiple approaches are used to justify the causal effect of CEOs' early-life experience on accounting conservatism, including a multiple fixed effects model, a PSM analysis, placebo tests, and a DiD approach. The results are robust after addressing different types of endogeneity concerns. Further, we employ the ratio of the population that was involved in the "send-down"[24] movement in each province to proxy the intensity of the Cultural Revolution in the CEO's birthplace. The results show that the more severe the CEO's exposure to the Cultural Revolution, the more pronounced the positive impact on accounting conservatism. Additional

[23] Basu (1997) interprets accounting conservatism as resulting in earnings reflecting "bad news" more quickly than "good news".

[24] The "send-down" movement was a very important political movement during the Cultural Revolution. It resulted in one-third of urban adolescents, approximately 17 million youths, being sent to the countryside for manual labour for up to 10 years during the period 1966–1976 (Li et al., 2010).

analysis suggests that CEOs with early-life experience increase the firm's provisions for liabilities, decrease accrual-based earnings management and reduce the firm's cash flow volatility, which explains the positive relationship between the early-life experience and conservative financial reporting behaviours.

This study contributes to the literature in two ways. First, we provide evidence to the developing research on the influence of CEOs' early-life experiences on corporate decisions. Based on upper echelons theory and imprinting theory, we find that CEOs with early-life Cultural Revolution experience are more risk-averse and conservative, thus exhibiting a higher demand for accounting conservatism. Prior studies have discussed the effect of CEOs' military experience (Benmelech and Frydman, 2015; Law and Mills, 2017), working experience (Custódio and Metzger, 2014; Quan et al., 2021),[25] war experience (Malmendier et al., 2011; Choi and Jung, 2021; Choi et al., 2021), famine experience (Feng and Johansson, 2018; Hu et al., 2020; Tian et al., 2023), and disaster experience (Bernile et al., 2016; Chen et al., 2021) on their risk preferences and managerial decisions. However, it is still inconclusive whether CEOs who have adverse early-life experiences would become more risk-averse or risk-taking. For example, Bernile et al. (2017) argue that early-life traumatic disaster experiences may help CEOs to better deal with risky situations and increase their confidence to make decisions. Chen et al. (2021) document that CEOs with early-life disaster experience are more risk tolerant, and thus they are more willing to accept the risks associated with bad news hoarding. Our empirical results add evidence to this debate. Moreover, our study examines the moderating effect of political influence on the documented positive association, and we find that CEOs with an early-life experience exhibit more risk-averse behaviours when facing stronger political influence.

[25] For example, Custódio and Metzger (2014) find that financial expert CEOs are more financially sophisticated and firms with financial expert CEOs hold less cash and more debt. Quan et al. (2021) document that CEOs with foreign experience are more likely to promote corporate green innovation.

Second, this study contributes to the literature in the field of research on accounting conservatism. Prior literature mainly examines the influencing factors of accounting conservatism from the perspectives of firm-level factors (Watts, 2003; Lara et al., 2009) and executives' demographic characteristics (Ho et al., 2015), as well as the external factors such as contracting, shareholder litigation, taxation, and accounting regulation (Watts, 2003; Bushman and Piotroski, 2006). However, there is a lack of research on the relation between CEOs' early-life traumatic experiences and accounting conservatism. Our study contributes to the view that accounting conservatism can be influenced by the early-life traumatic experiences of CEOs.

The remainder of this essay is organised as follows: Section 3.2 discusses the literature review and hypothesis development. Section 3.3 describes the data, variable construction, and regression model. Section 3.4 introduces the empirical results. Section 3.5 presents the conclusion.

3.2. Literature review and hypothesis development

3.2.1. Upper echelons theory

Upper echelons theory, first proposed by Hambrick and Mason (1984), indicates that top executives' characteristics can play an important role in affecting firm outcomes. As the leader in the top executive team, the CEO is the most influential decision-maker in a firm's daily operation (Graham et al., 2013). Prior studies have demonstrated the significant impact of CEOs' observable demographic characteristics, such as age, gender, tenure, and education, on firm performance and behaviours (Simsek, 2007; Serfling, 2014; Ho et al., 2015; King et al., 2016). More importantly, the central premise of upper echelons theory is that executives' experiences, values, and personalities largely influence their own choices and their firms' decisions (Hambrick, 2007). For instance, CEO life experience (e.g., work experience, disaster

experience), value and ideology, and personality (e.g., charisma, overconfidence), can significantly affect firm decision-making (Quan et al.,2021; Bernile et al., 2017; Berson et al., 2008; Hafenbrädl and Waeger, 2017; Boehm et al., 2015; Galasso and Simcoe, 2011).

As a key component of the upper echelons theory, decision-makers' early-life experience is one of the main focuses of the literature. Research on CEOs' early-life experiences better involves executives' heterogeneity, compared with the CEOs' observable characteristics (Xu and Ma, 2021). CEOs' early-life experiences account for differences in their risk-taking attitudes and firm strategic decisions. The literature suggests that CEOs' risk preferences are influenced by their military experience and working experiences, thereby affecting firm behaviours. For example, CEOs with military experience in early life are associated with more aggressive firm policies (Malmendier et al., 2011); CEOs with financial work experience hold less cash and more debt (Custódio and Metzger, 2014); CEOs with aircraft flying experience (hold private pilot licenses) are associated with higher equity return volatility and higher levels of leverage (Cain and McKeon, 2016); and CEOs with foreign work experience engage in more green innovation activities, which usually involve high risks and long investment horizons (Quan et al., 2021).

However, the experiences discussed above may be subject to the problem of managerial self-selection. For example, people who are more ambitious may choose to join the military, and those who prefer financial means may look for financial jobs. Hence, it is difficult to distinguish whether these experiences affect the CEOs' behaviours or whether the CEOs' internal characteristics make them choose these experiences (Xu and Ma, 2021). Recent studies, therefore, selected external random natural events that are not controlled and chosen by human beings as a proxy for CEOs' early-life experiences. In particular, CEOs' traumatic experiences and their impact on CEOs' risk-taking attitudes are the main focus. For instance, Malmendier et al. (2011) find that CEOs with early-life war experience tend to adopt more aggressive

policies. CEOs exposed to war in their earlier lives exhibit more conservative managerial policies (Choi and Jung, 2021; Choi et al., 2021). Moreover, studies examine the effect of CEOs with early-life disaster experiences on corporate behaviours. Bernile et al. (2017) document that CEOs who experienced fatal disasters lead to less conservative firm behaviours. Chen et al. (2021) find that CEOs with early-life disaster experiences are associated with higher firm stock price crash risk. In addition, empirical evidence shows that firms with CEOs who have early-life experience of the Great Chinese Famine[26] exhibit more conservative firm behaviours; e.g., CEOs who experienced the great famine in their childhood are more cautious and are associated with more conservative corporate policies (Zhang, 2017; Feng and Johansson, 2018) and lower stock crash risk (Long et al., 2020). Overall, the literature demonstrates that CEOs' early-life traumatic experiences greatly influence firm risk-taking behaviours.

3.2.2. Imprinting theory

The imprinting theory indicates that individuals in their growth process will be greatly influenced by the environment and generate imprints that match the characteristics of the environment, which continuously affect the behavioural decisions of individuals (Marquis and Tilcsik, 2013). Specifically, the application of imprinting theory mainly emphasizes the importance of past experiences and whether the occurrence period is in the sensitive periods when individuals are more susceptible to external influences. Importantly, the relevant past experiences are not all the past experiences of the individual, but the past experiences that have a significant impact on individuals, especially during sensitive periods in an individual's lifetime. Marquis and Tilcsik (2013) document that the early-life experiences that significantly influence individuals should meet the following three conditions: the events must be important

[26] The Great Chinese Famine was a natural disaster that occurred between 1959 and 1961 (Chen and Zhou, 2007; Huang et al., 2010).

and major, the events are continuous in time, and the impact of the events is wide-ranging and significant. Therefore, the events that meet the three conditions will have a long-lasting impact on some traits of the individuals despite subsequent environmental changes (Marquis and Tilcsik, 2013).

Psychology studies support the imprinting theory and highlight that imprints from traumatic early-life experiences are enduring and significant (Cryder et al., 2006; Duran, 2013). Also, traumatic imprints impact the sensitivity of individuals to their environmental influences (Lloyd et al., 1996). Although, there is a common aphorism saying "What doesn't kill you makes you stronger",[27] a growing body of research indicates that early-life traumatic experiences have long-term effects on CEOs' sensitivity to downside risk and decision-making. It is expected that traumatic experiences in early life would increase people's sensitivity to the riskiness of their environment. As discussed, studies have examined the relation between CEOs' early-life traumatic experiences and firm behaviours. For example, CEOs who have experiences of the Great Depression or traumatic war experiences in early life are more risk-averse and exhibit conservative behaviours (Malmendier et al., 2011; Choi et al., 2021). Moreover, CEOs with early-life experiences of the Great Chinese Famine are more cautious and conservative, leading to more conservative policies (Feng and Johansson, 2018), higher accounting conservatism, and lower stock price crash risk (Long et al., 2020). Hence, the considerable distress from the traumatic events that CEOs experienced in their early life can induce them to be more conservative. Overall, imprinting theory suggests that the long-lasting imprints from traumatic events which CEOs experienced in their early life have a significant influence on CEOs' sensitivity to environmental influences and firm behaviours.

[27] Bernile et al. (2017) argue that early-life traumatic disaster experiences may help CEOs to better deal with risky situations and increase their confidence to make decisions. For example, CEOs with early-life disaster experiences are less conservative, leading to more aggressive corporate policies (Bernile et al., 2017) and higher stock price crash risk (Chen et al., 2021).

3.2.3. Hypothesis development

3.2.3.1. CEOs' early-life experience and accounting conservatism

According to upper echelons theory (Hambrick, 2007; Hambrick and Mason, 1984), CEOs' characteristics such as early-life experiences can greatly influence their risk attitudes and play an important role in affecting firm outcomes. Specifically, external non-human events (such as natural disasters or wars) are selected by some studies to better proxy for CEOs' early-life experiences (e.g., Bernile et al., 2017). Imprinting theory indicates that some important early-life experiences in a CEO's growth process will have a long-lasting and significant effect on risk attitudes and choices (Marquis and Tilcsik, 2013). In particular, the imprints generated from traumatic early-life experiences (such as disaster or war experiences) are more enduring and pronounced (Cryder et al., 2006). These major imprinting events would change CEOs' risk aversion and further impact their managerial decisions. Based on these two theories, prior studies have provided empirical evidence to demonstrate that CEOs with early-life traumatic experiences have a significant influence on firm outcomes (e.g., Chen et al., 2021; Choi and Jung, 2021).

China's Cultural Revolution, lasting from May 1966 to October 1976, was an influential event which affected the country socially and economically (MacFarquhar and Schoenhals, 2009, MacFarquhar and Fairbank, 1991, MacFarquhar, 1974). For example, the schooling system was severely affected during this period. Most schools in urban China ceased regular operation for 6 years and universities stopped annual student recruitment for an even longer period of time (Meng and Gregory, 2002). Thus, the Cultural Revolution affected the formal education of a whole generation of young people. Moreover, the Revolution included cultural reforms, e.g., the "Destroying the Four Olds" movement, which refers to old customs, old

culture, old habits, and old ideas (Bai and Wu., 2020). Overall, the Revolution was later officially regarded as a period of "severe turmoil".[28]

Given its significant influence on individuals, the Cultural Revolution is an appropriate natural imprinting event to be selected for proxying CEOs' early-life experience. Based on upper echelons theory and imprinting theory, CEOs who experienced this historical event during their youth period (sensitive period) have greater suppression effects on their subsequent risk preferences and managerial behaviours, thus further impacting financial reporting policy decisions such as corporate accounting conservatism.

Prior studies document that people who experienced serious violence are more risk-averse and cautious. For example, individuals exposed to violence exhibit higher risk aversion and higher sensitivity to potential losses (Callen et al., 2014). Moya (2018) investigates a group of victims of violence in Colombia and finds that severe violence leads to higher levels of risk aversion in their economic decisions. Also, CEOs who experienced war in early life are associated with conservative managerial policies because they are more concerned about the potential downside risks (Choi et al., 2021; Choi and Jung, 2021). Therefore, CEOs with early-life experience could make the disclosure of "bad news" happen more quickly and increase accounting conservatism. We expect CEOs who have Cultural Revolution experience in their early life to be more conservative and risk-averse, thus exhibiting a higher level of accounting conservatism. Based on the above discussions, we propose our first hypothesis as below:

H1: CEOs with early-life experience are positively associated with corporate accounting conservatism.

[28] The official *Resolutions on Certain Questions in the History of the Party since the Founding of the PRC* stated: "[the Cultural Revolution] was an upheaval that was launched and manipulated by certain cliques, resulting in severe turmoil to the Party and the Chinese people."

3.2.3.2. The moderating effects of political influence

Political influence determines economic outcomes and significantly affects firms' decision-making (Pastor and Veronesi, 2012; An et al, 2016; Xu et al., 2016; Gu et al., 2019). The government, as a very important governance intervention actor, impacts firms in many ways. For example, the government influences companies through the imposition of taxes, offering subsidies, enforcing laws, regulating market competition, and establishing environmental policies (Pastor and Veronesi, 2012). In short, the government sets the rules of the game and shapes the context in which the firms operate.

Political influence in Chinese companies is particularly pronounced (Faccio, 2006). Political influence, including the macro-level political environment and micro-level firm-specific political connections, plays an essential role in affecting managerial behaviours and firm performance (An et al, 2016; Chen et al., 2018b; Gu et al., 2019). Macro-level political influence primarily stems from shifts in political power and alterations in regulations and policies. In China, two types of macro-level political influences are prominent. First, local political leadership turnover can lead to high political uncertainty. Because provincial leaders are typically deemed to possess supreme power over the operational business environment within the province, they are responsible for the province's economic development. Thus, political uncertainty can greatly affect firm behaviours. It is found that political uncertainty induces firms to minimize political risk and results in less risk-taking firm behaviours, such as less cash holding and reduced corporate investment (An et al., 2016; Xu et al., 2016). Second, China's anti-corruption campaign initiated by President Xi Jinping in 2012 is a critical political movement to combat social corruption with strong determination and sincere commitment (Deng, 2018). As an important political shock, the anti-corruption campaign exerts a strong

political influence on managerial behaviour and firm decision-making[29] (Cao et al., 2018; Zhang, 2018; Hope et al., 2020; Pan and Tian, 2020). Notably, high-profile provincial bureaucrat corruption cases took place during the anti-corruption campaign, leading to increased political uncertainty and heightened political risk. Therefore, CEOs with early-life Cultural Revolution experience are expected to be more risk-averse when subjected to higher political risks due to local political leadership changes or anti-corruption enforcement.

At the micro-level, the government's political control and intervention play an important role in a firm's daily operation. Government connections are beneficial to firms by providing them with state-controlled resources and protection such as preferential access to credit and government-related contracts (Borisova et al., 2015). For example, companies with stronger political connections have better access to debt financing (Khwaja and Mian, 2005), are more likely to receive bailouts (Faccio et al., 2006), and obtain more government investment (Duchin and Sosyura, 2012). SOEs are naturally politically connected since the controlling shareholders of SOEs are the government. Hence, SOE managers have strong incentives to seek political promotions because high political rankings indicate stronger political connections, which in turn can bring huge benefits such as privileges, perks, and social status (Jiang and Kim, 2020). Moreover, in agency theory, career interest is the most crucial aspect of executives' self-interest (Hu and Xu, 2022). SOE managers have limited outside work opportunities because they work in a closed pyramidal managerial labour market and often spend their entire careers in this SOE system (Chen et al., 2018a). Due to the political promotion incentives and political career concerns, SOE managers are more risk-averse and cautious when managing firms (Chen et al., 2018a). The government has the ultimate authority to hire and fire SOE managers. Thus,

[29] For example, empirical studies support the significant impact of the anti-corruption campaign on firm performance (Kong et al., 2017; Giannetti et al., 2021), financial reporting behaviour (Zhang, 2018; Hope et al., 2020), shareholder value (Cao et al., 2018; Chen et al., 2018c; Wang et al., 2018), and other firm behaviour (Gan and Xu, 2019; Pan and Tian, 2020; Zhou et al., 2022).

government influence can affect firm behaviour by affecting managers' political career concerns. It is expected that CEOs who experienced the Cultural Revolution in their early life would tend to be more risk-averse in decision-making in SOEs.

Overall, we argue that CEOs with early-life experience could exhibit more conservative corporate financial reporting behaviours in an environment with stronger political influence. Accordingly, we propose the following hypothesis:

H2: Political influence moderates the relation between CEOs' early-life experience and accounting conservatism.

3.3. Research design

3.3.1. Data and sample

The initial sample of this study includes all Chinese companies listed on the A-share market in the Shanghai and Shenzhen Stock Exchanges from 2007 to 2019. Information on the CEOs' birthyear, age and birthplace is collected manually. Firms' financial data and CEOs' other characteristic data are collected from the China Stock Market & Accounting Research (CSMAR) database. The starting year of this sample is 2007 because International Financial Reporting Standards (IFRS) were adopted in China on 1 January 2007.

Following prior literature, we exclude (1) financial firms, (2) special treatment (ST) firms, and (3) firm-year observations with missing data for control variables. Further, we follow Hu et al. (2020) and remove from our sample CEOs who were not Chinese citizens because we cannot identify whether or not they experienced China's Cultural Revolution. To avoid the impact of outliers, all continuous variables are winsorized at the 1% and 99% levels. The final sample includes 3,427 listed firms that consist of 23,018 firm-year observations.

3.3.2. CEOs' early-life experience

We construct *CR* variable as the measure of CEOs' early-life Cultural Revolution experience. *CR* is a dummy variable that equals 1 if the CEO experienced China's Cultural Revolution (1966–1976) between the age of 13 and 18, and 0 otherwise. This study defines CEOs born between 1948 and 1963 as the CEOs who experienced the revolution in their adolescence period. As stated previously, China's Cultural Revolution was an influential socio-political movement that occurred between 1966 and 1976. Moreover, previous physiology studies document that adolescence (13–18 years old) is one of the most critical stages for children to recognize and understand the world, preserve permanent memory, and form their character (Piaget, 2003; Piaget and Inhelder, 2008; Wadsworth, 1996). Krosnick and Alwin (1989) document that adolescence is the most sensitive period for individuals to form values, and major social events that happened during adolescence will have a persistent impact on the experiencers' implicit psychological traits. Thus, the adolescence cohort is more likely to have been affected by political violence than those who were in their infancy or childhood during the Cultural Revolution and who may have had better protection from their family.

3.3.3. Accounting conservatism (Cscore)

Cscore is the firm-specific asymmetric timeliness score developed by Khan and Watts (2009). Following Khan and Watts (2009), *Cscore* in this study is calculated using the following models:

$$\frac{EPS_{i,t}}{P_{i,t-1}} = \alpha_0 + \alpha_1 D_{i,t} + \beta_0 R_{i,t} + \beta_1 D_{i,t} \times R_{i,t} + \varepsilon_{i,t} \quad (3.1)$$

$$Gcore = \beta_0 = \mu_1 + \mu_2 SIZE_{i,t} + \mu_3 LEV_{i,t} + \mu_4 MB_{i,t} \quad (3.2)$$

$$CScore = \beta_1 = \lambda_1 + \lambda_2 SIZE_{i,t} + \lambda_3 LEV_{i,t} + \lambda_4 MB_{i,t} \quad (3.3)$$

where $EPS_{i,t}$ is earnings per share of firm i in year *t*; $P_{i,t-1}$ is the stock price of firm i in year *t-1*; $R_{i,t}$ refers to firm i's stock return over 12 months from May of year t to April of year t+1; $D_{i,t}$ is a dummy variable that equals 1 if $R_{i,t}$ is negative and 0 otherwise. *SIZE* is the natural logarithm of the market value of firm i in year *t*, *MB* is the market-to-book ratio of firm i in year *t*, and *LEV* is total debt divided by total assets of firm i in year *t*.

Replacing β_0 and β_1 obtained from Equations (3.2) and (3.3) into Equation (3.1) yields:

$$\frac{EPS_{i,t}}{P_{i,t-1}} = \alpha_0 + \alpha_1 D_{i,t} + (\mu_1 + \mu_2 SIZE_{i,t} + \mu_3 LEV_{i,t} + \mu_4 MB_{i,t}) \times R_{i,t} + (\lambda_1 + \lambda_2 SIZE_{i,t} + \lambda_3 LEV_{i,t} + \lambda_4 MB_{i,t}) \times D_{i,t} \times R_{i,t} + \varepsilon_{i,t} \quad (3.4)$$

We estimate Equation (3.4) with annual cross-sectional regressions and obtain the estimates of λ_1, λ_2, λ_3, and λ_4 to calculate the firm-year *Cscore* using Equation (3.3). *Cscore* measures the sensitivity of accounting earnings to "bad news" relative to confirmation of "good news"; therefore, a higher *Cscore* indicates a higher level of conditional accounting conservatism.

3.3.4. Control variables

Following the literature such as Hu et al. (2020) and Li et al. (2022), a series of variables are included to control for other factors that may be related to accounting conservatism. We include, first of all, *Firm size*, *Leverage*, *ROA. Firm size* is defined as the natural logarithm of total assets. *Leverage* is firm's financial leverage that is calculated as the book value of total debt divided by the book value of total assets. *ROA* is defined as the net income divided by total assets. Previous research finds that firm size, leverage and ROA have a significant impact on accounting conservatism (LaFond and Watts, 2008; Hu et al., 2020). Other firm-level variables include *Top1, Firm age, CFO, MB, Board size, Independence, Big 4, Sales growth,*

and *SOE*. *Top1* refers to the percentage ownership of the largest shareholder. *Firm age* is calculated as the natural logarithm of the number of years since the firm was founded at every year end. *CFO* is the ratio of net cash flow from operations to total assets. *MB* is the market-to-book ratio which captures for firm growth/investment opportunity (Smith and Watts, 1992). *Board size* is calculated as the natural logarithm of the total number of directors on the board. *Independence* is the ratio of the number of independent directors to the total number of directors. Lim (2011) documents that larger boards can enhance conditional accounting conservatism. *Big4* is a dummy variable that equals 1 if a firm is audited by an international Big 4 audit firm, and 0 otherwise. Firms with Big4 auditors have more qualified financial reporting. *Sales growth* is the growth in sales income. *SOE* is a dummy variable that equals 1 if the ultimate controller is an SOE or government agency, and 0 otherwise.

We also include CEO characteristics variables such as *CEO age, CEO gender* and *CEO duality*. *CEO age* is the natural logarithm of the CEO's age. *CEO gender* is a dummy variable that equals 1 if the CEO is male, and 0 otherwise. Old or female CEOs can be more conservative (Byrnes et al., 1999; Serfling, 2014). *CEO duality* is a dummy variable that equals 1 if the CEO and board chair positions are held by the same person, and 0 otherwise. It captures CEO power since powerful CEOs could be more risk-taking. Appendix A presents the definition of the variables in detail.

3.3.5. Model specification

To estimate the relationship between CEOs' early-life experience and corporate accounting conservatism, we use the following model:

$$Cscore_{i,t} = \beta_0 + \beta_1 CR_{i,t} + \sum_k \beta_k Controls_{k,i,t} + \epsilon_{i,t}, \quad (3.5)$$

As discussed, $Cscore_{i,t}$ is the measure of a firm's accounting conservatism. Firms with a higher *Cscore* are considered to be more conservative. $CR_{i,t}$ is a dummy variable that equals 1 if the CEO experienced the Cultural Revolution between the ages of 13 and 18, and 0 otherwise. $Controls_{k,i,t}$ is a set of control variables on a yearly basis, including $Firm\ size_{i,t}$, $Leverage_{i,t}$, $ROA_{i,t}$, $Top1_{i,t}$, $Firm\ age_{i,t}$, $CFO_{i,t}$, $MB_{i,t}$, $Board\ size_{i,t}$, $Independence_{i,t}$, $Big4_{i,t}$, $Sales\ growth_{i,t}$, $SOE_{i,t}$, $CEO\ age_{i,t}$, $CEO\ gender_{i,t}$, and $CEO\ duality_{i,t}$. Year and firm fixed effects are included in all regressions.

3.4. Empirical results

3.4.1. Descriptive statistics

Table 3.1 reports the descriptive statistics of the variables employed in this study. The mean value of *Cscore* is 0.015. On average, *CR* is 0.378, which indicates that 37.8% of CEOs experienced China's Cultural Revolution between 13 and 18 years old. Also, 45% of sample companies are SOEs. 94.1% of CEOs are male and 23.9% of CEOs also hold the position of chairman of the board. The distribution of the other variables[30] is in line with relevant literature, for example Tian et al. (2023).

Table 3.1. Descriptive statistics

This table reports the descriptive statistics of the main variables. The sample contains 23,018 observations from 3,427 firms listed on the Shanghai and Shenzhen stock exchanges from 2007 to 2019. Detailed definitions of variables are shown in Appendix A.

	(1) N	(2) Mean	(3) SD	(4) P25	(5) Median	(6) P75
Cscore	23,018	0.015	0.313	-0.062	0.016	0.148
CR	23,018	0.378	0.485	0.000	0.000	1.000
Firm size	23,018	22.154	1.286	21.220	21.980	22.896
Leverage	23,018	0.446	0.205	0.280	0.440	0.600
ROA	23,018	0.038	0.056	0.010	0.040	0.070

[30] The correlation matrixes for the variables are shown in Appendix C.

Top1	23,018	0.354	0.148	0.236	0.335	0.456
Firm age	23,018	2.786	0.365	2.560	2.830	3.040
CFO	23,018	0.046	0.072	0.010	0.050	0.090
MB	23,018	1.904	1.638	0.800	1.440	2.420
Board size	23,018	2.154	0.201	2.080	2.200	2.200
Independence	23,018	0.372	0.052	0.330	0.330	0.420
Big4	23,018	0.061	0.239	0.000	0.000	1.000
Sales growth	23,018	0.181	0.407	-0.011	0.114	0.274
SOE	23,018	0.450	0.497	0.000	0.000	1.000
CEO age	23,018	3.884	0.133	3.810	3.890	3.970
CEO gender	23,018	0.941	0.236	1.000	1.000	1.000
CEO duality	23,018	0.239	0.426	0.000	0.000	0.000

3.4.2. Baseline results

Table 3.2 reports the results of the regression on the impact of CEOs' early-life experience on accounting conservatism based on Equation (3.5). As shown in Column (1), the coefficient on *CR* is 0.065 and is statistically significant at the 1% level after controlling for firm characteristics. The coefficient on *CR* in Column (2) is 0.064, which is also positive and statistically significant at the l% level after controlling for both firm characteristics and CEO characteristics. The results show that CEOs with early-life experience are significantly and positively associated with accounting conservatism. These findings suggest that CEOs who experienced the Cultural Revolution in their early life are more risk-averse and conservative, thereby leading to a higher degree of corporate accounting conservatism. Thus, hypothesis H1 is supported.

Firm size and *ROA* are negatively and significantly associated with accounting conservatism, which indicates that larger companies or more profitable firms report less conservatively. *Leverage* is significantly and positively associated with accounting conservatism, suggesting that the demand for the implementation of conservative accounting is higher in companies with a higher level of leverage or debt (LaFond and Watts, 2008).

Table 3.2. CEO early-life experience and accounting conservatism

This table reports the impact of CEOs' early-life experience on accounting conservatism in Chinese listed firms. This table reports the coefficients of the regression as follows:

$$Cscore_{i,t} = \beta_0 + \beta_1 CR_{i,t} + \sum_k \beta_k Controls_{k,i,t} + \epsilon_{i,t}$$

$Cscore_{i,t}$ is the measure of firm's accounting conservatism. Firm with a higher *Cscore* is considered to be more conservative. $CR_{i,t}$ is a dummy variable that equals 1 if the CEO experienced China's Cultural Revolution between the age of 13 and 18, and 0 otherwise. $Controls_{k,i,t}$ is a set of control variables on a yearly basis, including *Firm size, Leverage, ROA, Top1, Firm age, CFO, MB, Board size, Independence, Big 4, Sales growth, SOE, CEO age, CEO gender,* and *CEO duality*. All continuous variables are winsorized at the 1% level in each tail, and the detailed definitions of all variables are shown in Appendix A. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
	Cscore	*Cscore*
CR	0.065***	0.063***
	(3.885)	(2.876)
Firm size	-0.133***	-0.134***
	(-8.957)	(-8.962)
Leverage	0.234***	0.234***
	(3.955)	(3.952)
ROA	-0.367***	-0.367***
	(-2.670)	(-2.667)
Top1	-0.022	-0.021
	(-0.238)	(-0.230)
Firm age	-0.066	-0.067
	(-0.826)	(-0.841)
CFO	0.041	0.040
	(0.457)	(0.452)
MB	-0.000	-0.000
	(-0.033)	(-0.034)
Board size	0.015	0.013
	(0.252)	(0.224)
Independence	-0.226	-0.224
	(-1.259)	(-1.246)
Big 4	0.039	0.039
	(0.765)	(0.768)
Sales growth	0.019	0.019
	(1.371)	(1.377)
SOE	0.018	0.017
	(0.421)	(0.396)
CEO age		0.016
		(0.206)
CEO gender		0.015

		(0.455)
CEO duality		-0.009
		(-0.444)
Constant	2.149***	2.086***
	(5.203)	(4.219)
Year FE	Yes	Yes
Firm FE	Yes	Yes
Observations	23,018	23,018
Adjusted R^2	0.096	0.096

3.4.3. The moderating effects of political influence

In this subsection, we examine the moderating effects of political influence on the association between CEOs' early-life experience and accounting conservatism. Especially, we employ macro-level political environment (political uncertainty and anti-corruption enforcement) and micro-level political connection (state ownership) to proxy political influence.

3.4.3.1. Moderating effects of macro-level political influence

3.4.3.1.1 Moderating effects of political uncertainty due to provincial official changes

To test hypothesis H2, we first examine the effect of CEOs' early-life experience on accounting conservatism according to province-level political uncertainty. Prior studies use the government official turnover to measure regional political uncertainty (An et al., 2016; Xu et al., 2016). It is important for Chinese firms to commit to political objectives and respond to the associated political risks. The political uncertainty is higher in the year when provincial leadership changes (Xu et al., 2016; An et al., 2016; Dai and Ngo, 2021). CEOs who experience the Cultural Revolution in their early life are expected to be more risk averse when subjected

to higher political uncertainty and political risk. Thus, the positive effect of CEOs' early-life experience on accounting conservatism could be more salient.

Following An et al. (2016) and Xu et al. (2016), we first construct a dummy variable to indicate the nature of government official turnover: *Single-Official* is a dummy variable that equals 1 if either the governor or party secretary of a province is changed in a year and 0 otherwise.[31] Then, we construct *Both-Official,* which is a dummy variable that equals 1 if both the governor and party secretary of a province are changed in a year, and 0 otherwise. We expect that CEOs with early-life experience would tend to exhibit more conservative financial reporting behaviours in an environment with higher political uncertainty. We divide the full sample into two subsamples, a lower and higher political uncertainty group, according to both provincial-level political uncertainty indicators.

Table 3.3 presents the results of subsample analyses based on provincial-level political uncertainty. The positive association between *CR* and *Cscore* is significant at the 5% level in the subsample with local political leadership turnovers (*Single-Official*=1 and *Both-Official*=1)[32]. However, the coefficient on *CR* is insignificant in the subsample without local political leadership turnovers (*Single-Official*=0 and *Both-Official*=0). The results indicate that CEOs with the early-life experience are more likely to adopt conservative accounting policies when facing higher political uncertainty, thus leading to a higher level of corporate accounting conservatism.

[31] If an official change occurs in the first (second) half of year t, we treat it as occurring in year t (year t + 1) (An et al., 2016; Xu et al., 2016).

[32] In terms of the economic significance, for example in Column (1), a firm's accounting conservatism (*Cscore*), during the government official turnover period, is 250% [coefficient on *CR* (0.085) / mean value of *Cscore* when *Single-Official*=1 (0.034)] higher when it is managed by a CEO with early-life Cultural Revolution experience compared with those that are not.

Table 3.3. Moderating effects of political influence (government official changes)

This table shows the regression results of subsample analyses based on political uncertainty. *Single-Official* is a dummy variable that equals 1 if either the governor or party secretary of a province is changed in a year, and 0 otherwise. *Both-Official* is a dummy variable that equals 1 if both the governor and party secretary of a province are changed in a year, and 0 otherwise. *CR*, *Cscore* and Controls are the same as in Table 3.2. Appendix A presents the detailed variable definitions. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable = *Cscore*	(1) *Single-Official*=1	(2) *Single-Official*=0	(3) *Both-Official*=1	(4) *Both-Official*=0
CR	0.085**	0.044	0.181**	0.037
	(2.214)	(1.512)	(2.200)	(1.523)
Firm size	-0.215***	-0.088***	-0.250***	-0.112***
	(-8.280)	(-4.398)	(-4.212)	(-6.909)
Leverage	0.416***	0.129	0.250	0.233***
	(3.968)	(1.619)	(1.056)	(3.582)
ROA	-0.159	-0.643***	-0.851	-0.449***
	(-0.634)	(-3.365)	(-1.412)	(-2.979)
Top1	-0.111	0.058	0.020	0.043
	(-0.686)	(0.477)	(0.056)	(0.431)
Firm age	0.343**	-0.295***	0.713**	-0.135
	(2.465)	(-2.800)	(2.138)	(-1.548)
CFO	0.121	0.054	0.350	0.052
	(0.724)	(0.448)	(0.910)	(0.524)
MB	-0.001	0.001	0.008	0.001
	(-0.057)	(0.110)	(0.287)	(0.159)
Board size	-0.068	0.062	-0.542**	0.083
	(-0.662)	(0.797)	(-2.356)	(1.292)
Independence	-0.447	-0.201	-2.467***	-0.071
	(-1.388)	(-0.833)	(-3.499)	(-0.360)
Big 4	0.095	-0.012	0.285	-0.002
	(1.096)	(-0.171)	(1.445)	(-0.031)
Sales growth	0.013	0.028	-0.023	0.025
	(0.493)	(1.505)	(-0.363)	(1.625)
SOE	0.071	0.004	0.100	-0.006
	(0.934)	(0.066)	(0.553)	(-0.122)
CEO age	0.033	0.058	-0.287	0.047
	(0.240)	(0.558)	(-0.945)	(0.551)
CEO gender	0.005	0.018	0.088	0.006
	(0.085)	(0.398)	(0.630)	(0.155)
CEO duality	-0.020	-0.020	0.069	-0.011
	(-0.550)	(-0.757)	(0.859)	(-0.513)
Constant	2.119**	1.990***	6.107***	2.223***
	(2.433)	(3.016)	(3.143)	(4.287)
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	8,550	14,468	3,076	19,942
Adjusted R^2	0.095	0.059	0.089	0.084

3.4.3.1.2. Moderating effects of anti-corruption enforcement

We then investigate the moderating effects of anti-corruption enforcement on the relation between CEOs' early-life experience and accounting conservatism. Following Liu et al. (2019) and Xie et al. (2019), we construct a dummy variable, *Corruption,*[33] to measure anti-corruption enforcement. Specifically, *Corruption* is a dummy variable that equals 1 if a firm's headquarters is located in the province where high-profile provincial bureaucratic corruption cases occur in the observation year, and 0 otherwise. It is expected that a firm located in a province with the announcement of high-profile corruption cases in the year would be subject to stronger anti-corruption enforcement, thus facing a higher level of political uncertainty and political risk. We expect that CEOs with early-life experience would tend to exhibit more risk-averse behaviour to deal with such strong political uncertainty and political risk.

We re-estimate our regression on two subsamples (*Corruption*=1 and *Corruption*=0) in Table 3.4. As shown in Table 3.4, the coefficient on *CR* is positive and significant at the 5% level in the *Corruption*=1 subsample, while the coefficient on *CR* is not statistically significant in the *Corruption*=0 subsample. The results indicate that the demand for conservative financial reporting of CEOs with early-life experience is increased in high anti-corruption enforcement regions. Thus, the positive effect of CEOs' early-life experience on corporate accounting conservatism is more pronounced when facing higher political uncertainty to mitigate the negative effect of political risk.

[33] We hand-collect the Corruption values from a list of Chinese corruption cases provided by Wikipedia (https://zh.wikipedia.org/wiki/中华人民共和国腐败案件列表, https://zh.wikipedia.org/wiki/中共十八大以来的反腐败工作, in Chinese).

Table 3.4. Moderating effects political influence (anti-corruption enforcement)

This table shows the regression results of subsample analyses based on local corruption shock occurrence (*Corruption*). *Corruption* is a dummy variable that equals 1 if a company's headquarter is in the province where high-profile provincial bureaucrats corruption cases were announced in the observation year, and 0 otherwise. *CR*, *Cscore* and Controls are the same as in Table 3.2. Appendix A presents the detailed variable definitions. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable = *Cscore*	(1)	(2)
	Corruption=1	*Corruption*=0
CR	0.110**	0.032
	(2.061)	(1.259)
Firm size	-0.186***	-0.126***
	(-4.889)	(-7.319)
Leverage	0.114	0.248***
	(0.764)	(3.592)
ROA	0.168	-0.458***
	(0.476)	(-2.827)
Top1	0.231	-0.081
	(0.961)	(-0.773)
Firm age	-0.033	-0.047
	(-0.189)	(-0.477)
CFO	0.130	-0.026
	(0.589)	(-0.249)
MB	-0.032**	0.007
	(-2.133)	(0.957)
Board size	-0.046	0.033
	(-0.314)	(0.490)
Independence	-0.740*	-0.060
	(-1.743)	(-0.280)
Big 4	-0.171	0.081
	(-1.583)	(1.298)
Sales growth	0.032	0.012
	(0.900)	(0.728)
SOE	0.102	0.017
	(0.962)	(0.351)
CEO age	-0.145	0.100
	(-0.758)	(1.107)
CEO gender	0.012	-0.010
	(0.152)	(-0.258)
CEO duality	-0.010	-0.001
	(-0.209)	(-0.031)
Constant	4.480***	1.376**
	(3.664)	(2.369)
Year FE	Yes	Yes
Firm FE	Yes	Yes
Observations	6,448	16,570
Adjusted R^2	0.072	0.071

3.4.3.2. Moderating effects of micro-level political influence

In addition, we examine the moderating effects of micro-level political influence, e.g., political connection, on the association between CEOs' early-life experience and accounting conservatism. An important institutional feature of the Chinese economy is that the government owns a considerable number of enterprises (Piotroski et al. 2015; Xin et al., 2019) and state ownership dominates Chinese listed firms (Huang and Zhu, 2015). The nature of ownership separates Chinese firms into two distinct types of firms: SOEs and non-SOEs. SOEs are ultimately controlled by state owners, and thus they are naturally politically connected. As argued before, SOE managers are more risk-averse and cautious in managing firms because of managers' political promotion incentives and political career concerns (Chen et al., 2018a). The positive effect of CEOs' early-life experience on accounting conservatism is expected to be more salient in SOEs.

In Table 3.5, we divide the full sample into *SOEs* and *Non-SOEs* subsamples and rerun our baseline regression using subsamples based on firms' ownership structure (*SOEs/Non-SOEs*). *SOEs* are identified if the firm's ultimate controller is an SOE or government agency. As shown in Table 3.5, the positive association between *CR* and *Cscore* is statistically significant at the 5% level for the *SOEs* subsample, while this positive association becomes insignificant for the *Non-SOEs* subsample. These results suggest that CEOs who experienced the Cultural Revolution in their early life tend to exhibit more conservative financial reporting behaviours in SOEs in which CEOs' political career concerns are more pronounced.

Table 3.5. Moderating effects of micro-level political influence (state ownership)

This table shows the regression results of subsample analyses based on firms' ownership structure (*SOEs/Non-SOEs*). *SOEs* are identified if the firm's ultimate controller is an SOE or government agency. *CR*, *Cscore* and Controls are the same as in Table 3.2. Appendix A presents the detailed variable definitions. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable = *Cscore*	(1)	(2)
	SOEs	*Non-SOEs*
CR	0.075**	0.027
	(2.028)	(1.111)
Firm size	-0.161***	-0.114***
	(-5.549)	(-7.620)
Leverage	0.298**	0.252***
	(2.563)	(4.424)
ROA	-0.336	-0.375***
	(-1.179)	(-2.987)
Top1	-0.171	0.085
	(-0.982)	(0.903)
Firm age	0.140	-0.098
	(0.837)	(-1.307)
CFO	-0.051	0.143*
	(-0.299)	(1.659)
MB	0.007	0.000
	(0.552)	(0.016)
Board size	-0.000	0.022
	(-0.001)	(0.374)
Independence	-0.436	0.037
	(-1.425)	(0.189)
Big 4	0.025	0.097
	(0.314)	(1.558)
Sales growth	0.024	0.010
	(0.900)	(0.764)
CEO age	0.118	-0.017
	(0.737)	(-0.231)
CEO gender	-0.013	0.016
	(-0.199)	(0.491)
CEO duality	-0.065	0.025
	(-1.588)	(1.360)
Constant	1.600	1.786***
	(1.586)	(3.678)
Year FE	Yes	Yes
Firm FE	Yes	Yes
Observations	10,354	12,664
Adjusted R^2	0.111	0.123

3.4.4. Endogeneity

Our baseline results may be subject to endogeneity. For example, CEOs with early-life experience are likely to choose firms with conservative behaviours, or some firms may hire CEOs who could be more conservative in accounting practice. It is also possible that there are omitted variables which may affect both CEO appointment and financial reporting decisions. In this section, we address the potential endogeneity issue in several ways, including adopting a multiple fixed effects model, a PSM analysis, placebo tests and a DiD approach.

3.4.4.1. Controlling for multiple fixed effects

We re-estimate our baseline model (Equation (3.5)) using firm fixed effects and industry×year or province×year fixed effects to address the concern that unobserved firm characteristics and time-varying heterogeneity across industries or provinces may affect accounting conservatism. Table 3.6 reports the regression results after including multiple fixed effects. The coefficients on *CR* in Table 3.6 are 0.034 and 0.036 in Columns (1) and (2), which are all positive and significant at least at the 5% level after controlling for the multiple fixed effects. This implies that our baseline results are robust when controlling for the multiple fixed effects.

Table 3.6. Endogeneity: Controlling for multiple fixed effects

This table reports the regression results after controlling for firm fixed effects as well as time-varying industry and province fixed effects. Control variables are the same as in Table 3.2. Appendix A presents the detailed variable definitions. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
	Cscore	*Cscore*
CR	0.034***	0.036**
	(2.612)	(2.523)

Firm size	-0.107***	-0.103***
	(-11.769)	(-10.474)
Leverage	0.249***	0.245***
	(6.947)	(6.244)
ROA	-0.377***	-0.394***
	(-4.516)	(-4.349)
Top1	-0.031	0.017
	(-0.551)	(0.287)
Firm age	-0.032	-0.073
	(-0.650)	(-1.360)
CFO	0.037	0.077
	(0.667)	(1.291)
MB	-0.003	0.004
	(-0.656)	(1.039)
Board size	0.002	0.037
	(0.064)	(0.958)
Independence	-0.101	-0.004
	(-0.931)	(-0.035)
Big 4	0.028	0.013
	(0.927)	(0.399)
Sales growth	0.013	0.011
	(1.583)	(1.243)
SOE	-0.028	0.002
	(-1.091)	(0.075)
CEO age	0.058	0.025
	(1.249)	(0.490)
CEO gender	0.017	0.022
	(0.818)	(0.970)
CEO duality	-0.003	0.003
	(-0.260)	(0.255)
Constant	2.014***	2.075***
	(6.524)	(5.989)
Industry*Year FE	Yes	No
Province*Year FE	No	Yes
Firm FE	Yes	Yes
Observations	23,018	23,018
Adjusted R^2	0.273	0.142

3.4.4.2. PSM analysis

Following Hu et al. (2020) and Long et al. (2020), we further employ the PSM analysis to examine whether the baseline results are subject to sample selection bias. We first estimate a

logit model to predict the likelihood that firms hire a CEO with early-life experience by including the control variables such as firm-specific variables in Column (1) of Table 3.2. The aim of the PSM is to produce two statistically similar samples with and without CEOs who experienced the Revolution, respectively. Then, we estimate the propensity score and perform a one-to-one PSM procedure. For each firm led by a CEO with early-life experience, we select one control firm with the closest propensity score and a CEO without early-life experience, constituting the matched control group.[34] Finally, we re-estimate Equation (3.5) using the PSM matched sample.

Column (1) in Panel A of Table 3.7 reports the results from a logit model with a binary *CR* dummy using the full sample. Firms with a larger size, firms with higher levels of operating cash flows, and SOEs are more likely to hire CEOs with experience of the Revolution. Column (2) shows the regression results of the PSM sample. The coefficients on *CR* remain positive and significant at the 5% level. Panel B of Table 3.7 reports the results of covariate balance checks on the mean difference of the covariates in the propensity-matched sample. The differences in means between the covariates of the treatment and control groups are insignificant, suggesting that our PSM procedure is successful.

Overall, the results in Table 3.7 suggest that the documented positive relation between CEOs with early-life experience and corporate accounting conservatism is robust after mitigating the sample selection concern.

[34] We match using the nearest neighbour within a 0.01 caliper (distance).

Table 3.7. Endogeneity: PSM analysis

Panel A reports the regression results using a PSM procedure. Column (1) reports the results from a logit model with a binary *CR* dummy using the full sample including industry and year fixed effects with standard errors clustered at firm level. Column (2) presents the regression results using the propensity-matched sample after controlling for firm and year fixed effects. Panel B reports the results of covariate balance checks on the mean difference of the covariates in the propensity-matched sample. Variable definitions are provided in Appendix A. All the continuous variables are winsorized at the 1% and 99% levels. The regressions control for the firm and year fixed effects. The t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: The regression results using PSM procedure

	(1) *CR*	(2) *Cscore*
CR		0.063**
		(2.161)
Firm size	0.070*	-0.158***
	(1.912)	(-7.627)
Leverage	-0.262	0.155*
	(-1.408)	(1.928)
ROA	0.078	-0.418**
	(0.161)	(-2.171)
Top1	0.258	-0.051
	(1.138)	(-0.409)
Firm age	0.177*	0.025
	(1.681)	(0.226)
CFO	0.576**	0.060
	(2.005)	(0.510)
MB	-0.031	0.002
	(-1.355)	(0.203)
Board size	0.309*	0.040
	(1.698)	(0.509)
Independence	1.008	-0.127
	(1.609)	(-0.529)
Big 4	0.044	0.003
	(0.314)	(0.043)
Sales growth	-0.102***	0.021
	(-2.626)	(1.154)
SOE	0.271***	-0.001
	(3.594)	(-0.013)
CEO age		0.025
		(0.227)
CEO gender		0.008
		(0.171)
CEO duality		0.004
		(0.160)
Constant	-2.553***	2.244***
	(-2.799)	(3.248)
Year FE	Yes	Yes
Firm FE	No	Yes
Industry FE	Yes	No

Observations	23,007	15,096
Pseudo R^2	0.079	
Adjusted R^2		0.068

Panel B: The results of covariate balance checks

	Firms with *CR*	Firms without *CR*	Diff. in means (t-stat)	Standardized Bias (%)
Firm size	22.155	22.162	–0.007	-0.6
			(–0.35)	
Leverage	0.455	0.456	–0.001	-0.1
			(–0.05)	
ROA	0.038	0.039	-0.001	-1.8
			(-1.14)	
Top1	0.359	0.360	-0.001	-0.7
			(-0.42)	
Firm age	2.766	2.765	0.001	0.3
			(0.21)	
CFO	0.045	0.046	-0.001	-1.6
			(-0.97)	
MB	1.841	1.847	-0.006	-0.4
			(-0.26)	
Board size	2.164	2.166	–0.002	-0.9
			(–0.57)	
Independence	0.371	0.371	–0.000	-0.3
			(–0.20)	
Big 4	0.062	0.066	–0.004	-1.5
			(–0.90)	
Sales growth	0.173	0.177	-0.004	-1.2
			(-0.75)	
SOE	0.493	0.488	0.005	1.1
			(0.68)	

3.4.4.3. Placebo tests

It is possible that the positive and significant effect of CEO's early-life experience is driven by spurious correlations in our data. For example, the documented results may also reflect the effect of other experiences of the CEOs born between 1948 and 1963. To control for the impact of endogeneity issues, following Chen et al. (2021), we conduct placebo tests to further validate the baseline results. First, we contrast a *pseudo-CR* variable based on the randomly assigned *CR* to measure CEO early-life experience. We employ a pseudo-*CR*

variable rather than a true *CR* variable to estimate the baseline model. Then, we repeat this procedure 500 times, thereby generating 500 coefficient estimates of the pseudo-*CR* variable for the accounting conservatism measure employed in this analysis. Using these estimates, we finally construct an empirical distribution of the *CR* coefficient under the scenario that the relation between CEO's early-life experience and accounting conservatism is of a spurious nature.

The results of this analysis are reported in Table 3.8. To facilitate comparison, we also report the actual *CR* coefficient estimates (from the baseline regression in Column (2) of Table 3.2). The table shows that actual *CR* coefficient estimates lie at the extreme upper tail of the empirical distributions of pseudo-*CR* coefficients, indicating that the baseline results are unlikely to be driven by spurious correlations.

Table 3.8. Endogeneity: Placebo tests

This table presents the results of placebo tests. *CR* is a dummy variable that equals 1 if the CEO experienced China's Cultural Revolution between the age of 13 and 18, and 0 otherwise. *Cscore* is the measure of firm's accounting conservatism. Firm with a higher *Cscore* is considered to be more conservative. We contrast a pseudo-*CR* variable based on the randomly assigned *CR* to measure CEOs' early-life experience. The procedure is repeated for500 times, thereby generating 500 coefficient estimates of the pseudo-*CR* variable. For comparison, We also report the actual estimate of *CR* coefficient, replicated from Column (2) of Table 3.2.

	(1) *Cscore*
Mean β for pseudo-*CR*	0.0008
Min β for pseudo-*CR*	-0.0328
1% percentile β for pseudo-*CR*	-0.0215
5% percentile β for pseudo-*CR*	-0.0154
25% percentile β for pseudo-*CR*	-0.0060
Median β for pseudo-*CR*	0.0005
75% percentile β for pseudo-*CR*	0.0081
95% percentile β for pseudo-*CR*	0.0184
99% percentile β for pseudo-*CR*	0.0247
Max β for pseudo-*CR*	0.0307
Coefficient of **actual *CR*** in column (2) of Table 3.2	**0.0652**

3.4.4.4. DiD analysis

We employ a DiD analysis by examining the changes in the level of accounting conservatism around CEO turnover to further address the endogeneity issues. Following Chen et al. (2021), we only keep the turnover events that involve a change in CEO early-life experience (i.e., a CEO without early-life experience is replaced by another CEO with early-life experience, or a CEO with early-life experience is replaced by another CEO without early-life experience). Also, the turnover events with insufficient data are excluded to construct an accounting conservatism measure over the five-year window around the events (i.e., *t-2 to t+2*). The final sample consists of 285 CEO turnover events, of which 47 events are about changing from a CEO without early-life experience to a CEO with early-life experience, and 238 events are about changing from a CEO with early-life experience to a CEO without early-life experience. We calculate the average *Cscore* for the pre-CEO change window (i.e., *t-2 to t-1*) and the post-CEO change window (i.e., *t+1 to t+2*), separately. Then, we calculate the changes in the average values between the two windows.

The results of this analysis are reported in Table 3.9. Accounting conservatism (*Cscore*) increases significantly when a firm changes its CEO from one without early-life experience to one with early-life experience. In addition, accounting conservatism decreases significantly when a firm changes its CEO from one with early-life experience to one without early-life experience. Also, the difference between the two cases is statistically significant. The DiD analysis confirms the baseline result.

Table 3.9. Endogeneity: DiD analysis

This table presents the changes in accounting conservatism measure around CEO turnover events, where CEO with (without) early-life experience replaced CEO without (with) early-life experience. *Cscore* is the measure of firm's accounting conservatism. For each CEO turnover event happened in year t, the change of *Cscore* is calculated by subtracting the average value of the variable over years [t-2, t-1] from the average value of the variable over year [t+1, t + 2]. The first column reports the mean change around CEO turnover events where the incoming CEO has early-life experience, while prior CEO does not have early-life experience. The second column reports the mean change around CEO turnover events where the incoming CEO does not have early-life experience, while prior CEO has early-life experience. The third column reports the difference between column (1) and column (2). The t-statistics are reported in the parentheses.

CEO turnover events			
	CEO without experience to CEO with experience (N = 47)	CEO with experience to CEO without experience (N = 238)	(1) minus (2)
	(1)	(2)	(3)
Δ*Cscore*	0.117**	-0.082**	0.199***
	(2.111)	(-2.045)	(5.767)

3.4.5. Robustness check

3.4.5.1 Controlling for the Cultural Revolution intensity of CEO birthplace

While the Cultural Revolution affected the whole country, its severity varied across provinces. Under this circumstance, the severity of the Cultural Revolution determines how deeply the experience of the Cultural Revolution is imprinted on CEOs. Thus, we first collect the birthplace information of the CEOs, which is obtained from the CSMAR database, and we manually collect the missing birthplace information through Google and the Baidu browser if it is not available on the CSMAR database. Then, we construct the *Intensity*[35] variable, which indicates the severity of the Cultural Revolution in CEOs' birth provinces to measure the intensity of the Cultural Revolution that CEOs experienced. Specifically, *Intensity* is calculated as the proportion of the population in each province that is involved in the "send-down" movement[36] during the Cultural Revolution period. The "send-down" movement resulted in

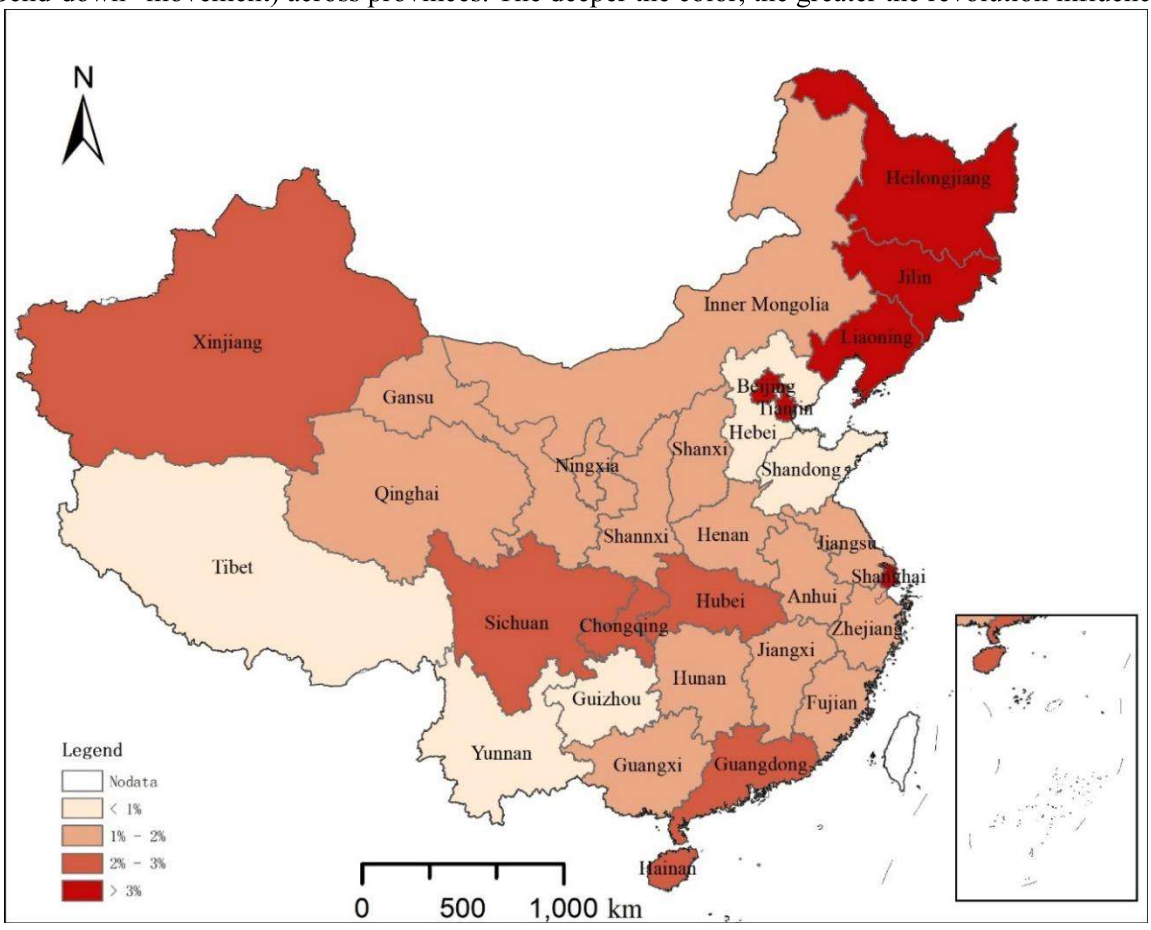
[35] The Revolution intensity used to measure *Intensity* is shown in Appendix B.

[36] The send-down movement is also known as "going up to the mountains and down to the villages" (shangshan xiaxiang), or the "rustication movement."

one out of every three urban adolescents, approximately 17 million[37] youths, being sent to the countryside for manual labour for from one or two to as many as ten years during the period 1966–1976 (Li et al., 2010). Also, the send-down experience largely impacted these youths' long-term characteristics such as financial behaviour (Fan, 2017), political attitudes (Harmel and Yeh, 2016), and beliefs and values (Gong et al., 2015). Hence, the larger the proportion of the "move-down" youths, the higher the severity of the Cultural Revolution. Figure 1 reports the intensity of the Cultural Revolution across provinces in China[38]. The deeper the colour, the greater the Revolution influence. We can see the variability of the intensity, with the strongest Revolution intensity being in Shanghai, Beijing, and Tianjin.

Figure 1. Cultural Revolution intensity across China

Figure 1 reports the Cultural Revolution intensity (the proportion of population that was involved in "Send-down" movement) across provinces. The deeper the color, the greater the revolution influence.



[37] The detailed population that was involved in the "send-down" movement in each province during the Cultural Revolution is reported in Appendix B.

[38] The classification criteria are used to show the figure only. We use provincial-level Cultural Revolution intensity itself in the regressions, e.g., Equation 3.6.

We first re-run Equation (3.5) and control for CEOs' birthplace fixed effects. As shown in Column (1) of Table 3.10, the coefficient on *CR* is 0.123 and is significant at the 5% level. It indicates that our baseline results remain robust after controlling for CEO birthplace fixed effects. Then we construct Equation (3.6) to examine the impact of CEOs' early-life experience on accounting conservatism considering the intensity of the Cultural Revolution:

$$Cscore_{i,t} = \beta_0 + \beta_1 CR_{i,t} * Intensity_{i,t} + \beta_2 CR_{i,t} + \beta_3 Intensity_{i,t} + \sum_k \beta_k Controls_{k,i,t} + \epsilon_{i,t}, \quad (3.6)$$

where all variables are the same as those in Equation (3.5) by adding $CR_{i,t} * Intensity_{i,t}$, which is the interaction term between $CR_{i,t}$ and $Intensity_{i,t}$. $Intensity_{i,t}$ refers to the severity of the Cultural Revolution in a CEO's birth province. Year, firm, and CEO's birthplace fixed effects are included to estimate the regressions.

It is expected that the interaction term (*CR*Intensity*) between the CEOs' early-life experience measure (*CR*) and the intensity of the Cultural Revolution in the CEOs' birth province (*Intensity*) has a significantly positive influence on accounting conservatism. As shown in Column (2) of Table 3.10, the coefficient on *CR*Intensity* is positive and significant at the 5% level, indicating a more significant increase in the level of accounting conservatism of firms having CEOs with higher intensity of early-life experience.

Table 3.10. Robustness check: Controlling for the intensity of the Cultural Revolution

This table reports the impact of CEOs' early-life experience on accounting conservatism in and in Chinese listed firms considering of the CEOs' birthplace severity of the Cultural Revolution. Specially, Column (1) reports the baseline results after controlling for the CEOs' birthplace fixed effect. Column (2) reports the coefficients of the following regression:

$$Cscore_{i,t} = \beta_0 + \beta_1 CR_{i,t} * Intensity_i + \beta_2 CR_{i,t} + \beta_3 Intensity_i + \sum_k \beta_k Controls_{k,i,t} + \epsilon_{i,t}$$

Where $CR_{i,t} * Intensity_{i,t}$ is the interaction term between $CR_{i,t}$ and $Intensity_{i,t}$. $CR_{i,t}$ is a dummy variable that equals 1 if the CEO experienced China's Cultural Revolution between the age of 13 and 18, and 0 otherwise. $Intensity_i$ refers to the severity of Cultural Revolution in CEOs' birth provinces. $Controls_{k,i,t}$ refers to a set of control variables. All continuous variables are winsorized at the 1% level in each tail. The detailed definitions of all variables are shown in Appendix A. Firm, year and CEO birthplace fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
	Cscore	*Cscore*
*CR*Intensity*		0.032**
		(2.141)
CR	0.123**	0.048
	(2.354)	(0.771)
Intensity		-0.026
		(-1.345)
Firm size	-0.123***	-0.123***
	(-4.362)	(-4.349)
Leverage	0.066	0.068
	(0.632)	(0.649)
ROA	-0.608**	-0.602**
	(-2.507)	(-2.484)
Top1	-0.137	-0.132
	(-0.763)	(-0.730)
Firmage	-0.141	-0.144
	(-1.211)	(-1.239)
CFO	0.115	0.111
	(0.785)	(0.759)
MB	-0.007	-0.007
	(-0.734)	(-0.756)
Board size	0.003	-0.003
	(0.032)	(-0.028)
Independence	-0.358	-0.367
	(-1.187)	(-1.219)
Big 4	0.165*	0.165*
	(1.954)	(1.944)
Sales growth	0.040*	0.040
	(1.676)	(1.636)
SOE	-0.022	-0.019

	(-0.248)	(-0.212)
CEO age	-0.108	-0.137
	(-0.602)	(-0.763)
CEO gender	-0.097	-0.100
	(-1.082)	(-1.114)
CEO duality	0.048	0.051
	(1.265)	(1.321)
Constant	3.486***	3.658***
	(3.697)	(3.866)
Year FE	Yes	Yes
Firm FE	Yes	Yes
Birthplace FE	Yes	Yes
Observations	9,215	9,215
Adjusted R^2	0.128	0.128

3.4.5.2. Alternative measure of CEOs' early-life experience

We then construct an alternative measure of CEOs' early-life Cultural Revolution experience to further examine the robustness of our baseline results. *CR-years* is the natural logarithm of one plus the number of years that a CEO experienced China's Cultural Revolution (1966-1976) between the age of 13 and 18. We expect that the more years the CEOs experienced the Cultural Revolution during their adolescence period, the more they were affected by it. Thus, CEOs exposed to the Cultural Revolution for a longer time in adolescence could be more risk-averse and tend to adopt more conservative financial reporting policies.

Table 3.11 presents the regression results of employing alternative measures of CEOs' early-life Cultural Revolution experience. The coefficients on *CR-years* are all positive and significant at least at the 10% level after controlling for firm and year fixed effects in Column (1), firm and industry×year fixed effects in Column (2), and province×year fixed effects in Column (3). These results indicate that the more years CEOs experienced the Cultural Revolution during their adolescence period, the more pronounced the positive impact on corporate accounting conservatism.

Table 3.11. Robustness check: Alternative measure of CEOs' early-life experience

CR-years is the natural logarithm of one plus the number of years that a CEO experienced China's Cultural Revolution (1966-1976) during the age of 13 and 18. *Controls* are the same as in Table 3.2. Appendix A presents the detailed variable definitions. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)
	Cscore	*Cscore*	*Cscore*
CR-years	0.022**	0.017*	0.016**
	(2.236)	(1.846)	(2.025)
Firm size	-0.113***	-0.108***	-0.092***
	(-11.574)	(-11.804)	(-11.928)
Leverage	0.251***	0.251***	0.246***
	(6.506)	(6.982)	(7.957)
ROA	-0.376***	-0.377***	-0.355***
	(-4.182)	(-4.512)	(-4.986)
Top1	-0.021	-0.030	0.016
	(-0.343)	(-0.547)	(0.340)
Firm age	-0.055	-0.032	-0.067
	(-1.047)	(-0.645)	(-1.588)
CFO	0.063	0.037	0.078*
	(1.075)	(0.677)	(1.679)
MB	0.004	-0.003	0.006**
	(0.893)	(-0.692)	(1.968)
Board size	0.020	0.002	0.030
	(0.522)	(0.055)	(0.984)
Independence	-0.074	-0.101	0.003
	(-0.629)	(-0.936)	(0.034)
Big 4	0.017	0.027	0.010
	(0.503)	(0.897)	(0.371)
Sales growth	0.011	0.013	0.007
	(1.171)	(1.579)	(1.031)
SOE	0.002	-0.027	0.001
	(0.070)	(-1.046)	(0.054)
CEO age	0.045	0.075	0.030
	(0.859)	(1.553)	(0.712)
CEO gender	0.020	0.016	0.019
	(0.889)	(0.804)	(1.086)
CEO duality	0.001	-0.003	0.007
	(0.116)	(-0.276)	(0.642)
Constant	4.480***	1.960***	1.827***
	(3.664)	(6.240)	(6.586)
Year FE	Yes	No	No
Industry*Year FE	No	Yes	No
Province*Year FE	No	No	Yes
Firm FE	Yes	Yes	Yes
Observations	23,018	23,018	23,018
Adjusted R^2	0.139	0.273	0.166

3.4.6. Additional analysis-Conservative accounting practice

In this section, we conduct additional tests to examine whether CEOs with early-life experience can lead to conservative accounting behaviours in a firm. To achieve a higher level of accounting conservatism, some accounting policies and practices can be adopted. Provisions for liabilities is an example of such accounting practice. Provisions represent funds put aside by a company to cover anticipated losses in the future; thus, higher provisions can enable firms to recognize bad news more promptly than it does good news, leading to asymmetric timeliness of earnings (Beaver and Ryan, 2005). Following Hu et al. (2020), we first employ *Provisions* (measured by total provisions for liabilities over total assets) as one of our variables to proxy accounting conservatism.

We then employ accrual-based earnings management (*EM*) as the second variable of interest. *EM* refers to discretionary accruals, which are calculated following the modified Jones model (Dechow et al., 1995). A lower level of accrual-based earnings management indicates a more conservative financial reporting behaviour (Arun et al., 2015; Liu et al., 2016). Further, we employ cash flow volatility (*CFO_Vol*) as the third variable of interest. *CFO_Vol* refers to the rolling standard deviation of a firm's cash flows from operations scaled by total assets over a three-year window. Lower cash flow volatility indicates that firms are less risk-taking and less likely to have internal cash flow shortages (Minton and Schrand, 1999). Hence, lower cash flow volatility contributes to more conservative management activities (Géczy et al., 1997).

Table 3.12 reports the results of the regression analysis. *CR* is significantly associated with higher *Provisions*, less *EM*, and lower *CFO_Vol*, suggesting that CEOs with the early-life experience are more risk-averse and conservative, thus increasing firms' provisions for liabilities, reducing accrual-based earnings management, and decreasing firm cash flow volatility. These results provide further evidence for how a CEO who experienced the Cultural Revolution in early life exhibits more risk-averse and conservative accounting practices.

Table 3.12. Additional analysis: Conservative financial reporting behaviors

This table reports the results from the ordinary least squares regression between the CEOs' early-life experience, and provisions for liabilities (*Provisions*) in Column (1), accrual-based earnings management (*EM*) in Column (2), and cash flow volatility (*CFO-Vol*) in Column (3). Appendix A presents the detailed variable definitions. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)
	Provisions	*EM*	*CFO_Vol*
CR	0.004***	-0.008**	-0.003**
	(3.192)	(-2.176)	(-2.185)
Firm size	-0.005***	0.008***	-0.006***
	(-4.968)	(3.100)	(-6.668)
Leverage	0.012***	0.011	0.028***
	(3.114)	(1.104)	(8.077)
ROA	-0.505***	1.127***	0.053***
	(-58.159)	(48.022)	(6.508)
Top1	-0.005	0.009	0.018***
	(-0.840)	(0.597)	(3.377)
Firm age	0.012**	0.010	0.014***
	(2.259)	(0.723)	(2.669)
CFO	0.055***	-1.181***	-0.008
	(9.549)	(-77.264)	(-1.414)
MB	0.006***	-0.000	0.002***
	(15.945)	(-0.402)	(5.510)
Board size	0.001	-0.004	-0.008**
	(0.357)	(-0.451)	(-2.343)
Independence	0.004	-0.027	0.016
	(0.357)	(-0.872)	(1.475)
Big 4	0.002	-0.002	-0.002
	(0.539)	(-0.287)	(-0.703)
Sales growth	0.001	0.001	-0.006***
	(1.324)	(0.544)	(-4.888)
SOE	-0.005*	0.001	-0.001
	(-1.695)	(0.129)	(-0.207)
CEO age	-0.013***	0.007	0.005
	(-2.623)	(0.497)	(1.108)
CEO gender	-0.003	0.003	-0.002
	(-1.280)	(0.496)	(-1.157)
CEO duality	-0.000	0.001	0.000
	(-0.233)	(0.405)	(0.195)
Constant	0.059*	-0.301***	0.120***
	(1.826)	(-5.232)	(4.044)
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	21,730	22,937	21,502
Adjusted R^2	0.332	0.343	0.318

3.5. Conclusion

Based on the theoretical framework of upper echelons theory and imprinting theory, we investigate the impact of CEOs with early-life experience on corporate accounting conservatism. Specifically, using a large sample of Chinese listed firms, we find that CEOs who experienced China's Cultural Revolution in their early life are more risk-averse and conservative, thus leading to a higher level of accounting conservatism. Further analysis indicates that the positive relation between CEOs' early-life experience and accounting conservatism is more salient in those firms subject to stronger political influence. In particular, such a positive association is more pronounced in the provinces marked by higher political uncertainty, e.g., where the provincial leadership changes and where high-profile provincial bureaucratic corruption cases occur. The early-life experience effect is also stronger in SOEs where CEOs' political career concerns are stronger.

We further document that the more severe the CEOs' exposure to the Cultural Revolution in their early life, the more pronounced the positive impact of the early-life experience on accounting conservatism. In addition, we find that CEOs with early-life experience are more likely to increase firms' provisions for liabilities, decrease accrual-based earnings management, and reduce firm operating cash flow volatility, all the variables proxy conservative accounting behaviours.

Overall, the results suggest that the long-lasting imprints from Cultural Revolution experiences can shape CEOs' risk preferences and managerial decisions, thus greatly influencing firm accounting conservatism. The findings have implications for upper echelons theory and imprinting theory and contribute to the proposition that accounting conservatism can be influenced by the early-life experiences of CEOs.

3.6. Appendix

Appendix A. Variable definitions

This appendix reports the definition of the main variables used in this study.

Cscore	The degree of conditional accounting conservatism calculated following Khan and Watts (2009).
CR	A dummy variable that equals one if the CEO experienced China's Cultural Revolution (1966-1976) at the age of 13 and 18, and zero otherwise.
Firm size	The natural logarithm of total assets.
Leverage	The book value of total debt divided by the book value of total assets.
ROA	Net income divided by total assets.
Top1	Percentage of shares owned by the largest shareholder.
Firm age	The natural logarithm of the number of years since a firm's establishment.
CFO	The ratio of net cash flow from operations to total assets.
MB	Market to book ratio.
Board size	The natural logarithm of the total number of directors on the board.
Independence	The proportion of independent directors to total number of directors on the board.
Big4	A dummy variable that equals one if a firm hires an international Big 4 audit firm, and zero otherwise.
Sales growth	Growth in sales income.
SOE	A dummy variable that equals one if the ultimate controller of the firm is an SOE or government agency, and zero otherwise.
CEO age	The natural logarithm of the CEO's age.
CEO gender	A dummy variable that equals one if the CEO is male, and zero otherwise.
CEO duality	A dummy variable that equals one if the CEO and board chair positions are held by the same person, and zero otherwise.
CR-years	The natural logarithm of one plus the number of years that a CEO experienced China's Cultural Revolution (1966-1976) during the age of 13 and 18.
Intensity	The intensity of the Cultural Revolution in each province.
Single-Official	A dummy variable that equals one if either the governor or party secretary of a province is changed in a year, and zero otherwise.
Both-Official	A dummy variable that equals one if both the governor and party secretary of a province are changed in a year, and zero otherwise.
Corruption	A dummy variable that equals one if a firm's headquarter is in the province where high-profile provincial bureaucrats corruption cases were announced in the observation year, and zero otherwise.
Provisions	Total provisions over total assets.
EM	Discretionary accruals, which are calculated following the modified Jones model (Dechow et al., 1995).
CFO_Vol	The volatility of a firm's operating cash flows over three-year sample periods.

Appendix B. "Send-down" movement population and Cultural Revolution intensity

This appendix reports the detailed population that was involved in "Send-down" movement in each province during the Cultural Revolution and the intensity of the Cultural Revolution in each province.

Province	Send-down population	Population	*Intensity (*Send-down population / Population)
Beijing	636,300	8,100,278	7.86%
Tianjin	465,100	6,681,722	6.96%
Hebei	384,400	45,418,333	0.85%
Shanxi	264,300	21,204,683	1.25%
Inner Mongolia	193,800	15,274,722	1.27%
Liaoning	2,013,400	30,666,167	6.57%
Jilin	991,400	18,673,667	5.31%
Heilongjiang	1,519,200	25,676,944	5.92%
Shanghai	1,252,200	10,854,556	11.54%
Jiangsu	828,400	51,990,400	1.59%
Zhejiang	646,200	33,144,489	1.95%
Anhui	576,500	39,610,000	1.46%
Fujian	372,300	20,616,339	1.81%
Jiangxi	504,500	26,255,628	1.92%
Shandong	512,900	64,088,333	0.80%
Henan	673,000	60,713,889	1.11%
Hubei	886,600	40,104,122	2.21%
Hunan	635,800	44,872,294	1.42%
Guangdong	973,200	44,054,650	2.01%
Guangxi	434,800	28,541,667	1.52%
Sichuan	1,472,400	4,374,100	2.39%
Guizhou	213,500	61,616,500	0.97%
Yunnan	232,500	22,066,917	0.91%
Tibet	3,400	25,527,278	0.22%
Shaanxi	463,100	1,546,206	1.90%
Gansu	245,200	24,377,222	1.54%
Qinghai	43,600	15,920,872	1.51%
Ningxia	49,200	2,888,139	1.75%
Xinjiang	277,600	2,814,383	2.81%
Overall	17,764,800	797,674,500	2.74%

Appendix C. Correlation matrix

This table reports the Pearson correlation matrix for the variables in the analysis. Detailed definitions of variable

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(1
1. Cscore	1.000											
2. CR	-0.050***	1.000										
3. Firm size	-0.075***	0.103***	1.000									
4. Leverage	-0.006	-0.021**	-0.483***	1.000								
5. ROA	-0.199***	0.041***	0.243***	0.038***	1.000							
6. Top1	-0.040***	0.075***	0.158***	-0.011	0.473***	1.000						
7. Firm age	-0.085***	0.070***	0.034***	0.041***	0.230***	0.074***	1.000					
8. CFO	0.067***	-0.087***	-0.021**	-0.002	0.186***	0.134***	-0.132***	1.000				
9. MB	-0.036***	0.025***	0.057***	-0.031***	0.034***	-0.165***	0.077***	-0.009	1.000			
10. Board size	0.084***	-0.050***	-0.151***	0.034***	-0.491***	-0.461***	-0.064***	-0.124***	0.147***	1.000		
11. Independence	-0.055***	0.009	0.015*	-0.024***	0.002	-0.366***	0.122***	-0.089***	0.369***	0.289***	1.000	
12. Big4	-0.080***	0.161***	0.285***	-0.071***	0.311***	0.287***	0.220***	0.108***	0.013	-0.228***	-0.089***	1.00
13. Sales growth	-0.124***	0.049***	0.098***	0.043***	0.357***	0.100***	0.146***	0.007	0.077***	-0.102***	0.042***	0.13
14. SOE	-0.005	-0.012	-0.007	-0.003	0.048***	0.047***	0.028***	-0.058***	0.011	0.070***	0.212***	-0.0
15. CEO age	-0.008	0.570***	0.041***	0.019**	0.142***	0.003	0.038***	0.131***	0.055***	-0.056***	0.027***	0.09
16. CEO gender	-0.018**	0.006	0.076***	-0.052***	0.030***	0.018**	0.004	-0.026***	-0.007	-0.023***	-0.021**	0.07
17. CEO duality	0.043***	0.034***	-0.185***	0.112***	-0.150***	-0.143***	-0.058***	-0.061***	-0.014*	0.126***	0.040***	-0.2

CHAPTER FOUR ESSAY THREE

CEO early-life experience and its effect on stock price crash risk

Abstract

Using China's Cultural Revolution (1966–1976) as a shock to risk attitude, this study examines the influence of CEOs' early-life experience on stock price crash risk. We document that CEOs who experienced the Cultural Revolution in their early life are more risk-averse and less likely to hoard bad news, and thereby are associated with a lower level of stock price crash risk. Such a negative relationship is more pronounced in firms that are subjected to higher litigation risk, e.g., when firms are involved in major lawsuits, when firms are in industries with higher litigation risk, and when firms are in areas with better regional legal development. The results indicate that litigation risk moderates the impact of CEOs' early-life experience on stock price crash risk. Our channel analysis suggests that firms having CEOs with early-life Cultural Revolution experience are less likely to engage in earnings management and tax avoidance, which explains the mitigating effect of CEOs' early-life experience on crash risk. Our study adds new evidence to support the upper echelons theory and imprinting theory by highlighting the influence of CEOs' early-life experience on stock price crash risk.

Keywords: CEO early-life experience; China's Cultural Revolution; Stock price crash risk; Litigation risk; Upper echelons theory; Imprinting theory

4.1. Introduction

The upper echelons theory suggests that CEOs' experiences are a key factor that influences corporate strategic decisions and outcomes (Hambrick and Mason, 1984; Hambrick, 2007). While past research has focused on CEOs' observable experiences such as adult personal experiences, for example, military experiences (Benmelech and Frydman, 2015; Law and Mills, 2017), flying experiences (Cain and McKeon, 2016; Sunder et al., 2017), financial experience (Custódio and Metzger, 2014), and foreign experience (Quan et al., 2021). Scholars have recently shifted their attention to CEOs' early-life experiences (e.g., Bernile et al., 2016; Zhang, 2017; O'Sullivan et al., 2021; Xu and Ma, 2021; Han et al., 2022; Tian et al., 2023). CEOs' early-life experiences can have a profound impact on their decision-making and leadership style, and this is especially true for CEOs who grew up during extreme events. Employ China's Cultural Revolution as a risk-attitude-shocking event, this paper investigates the influence of CEOs' early-life experience on stock price crash risk. The Cultural Revolution was an influential political upheaval that occurred in Mainland China during 1966-1976 (MacFarquhar et al., 1991; MacFarquhar and Schoenhals, 2009). The social mobilization went deep due to such a political movement, which affected nearly every Chinese citizen to some extent during its worst period (Walder, 2015).

According to the imprinting theory, exposure to adverse or traumatic events during individuals' early-life (childhood or adolescence) has a long-lasting effect on their risk preference and personality traits (Marquis and Tilcsik, 2013). Thus, past traumatic life experiences can generate long-term imprints that subsequently affect CEOs' future risk preference and decision-making. Existing literature supports the significant role of CEOs' early-life adverse experiences in affecting firm risk-taking behaviours, such as war experience (Malmendier et al., 2011; Choi and Jung, 2021), natural disaster experience (Bernile et al., 2017; Chen et al., 2021), the great depression experience (Malmendier and Nagel, 2011;

Malmendier et al., 2011), and the great famine experience (Hu et al., 2020; Long et al., 2020; Tian et al., 2023). For example, Choi and Jung (2021) find that CEOs who experienced the Korean War in early life are more risk-averse and more concerned about the potential downside risks, thus leading to higher level of firm information transparency. Tian et al. (2023) document that CEOs with childhood great famine experience have less risk tolerance and are negatively associated with strategic risk-taking. It is also found that CEOs with early-life natural disaster experiences are more willing to take risks, thus leading to higher stock price crash risk (Chen et al., 2021) and more R&D investment (Gao et al., 2021). Inspired by the significant impact of CEOs' early-life adverse experience on managerial risk-taking behaviour and the inconclusive empirical evidence, this study examines whether and how CEOs' early-life Cultural Revolution experience affects firms' stock price crash risk.

Stock price crash refers to the "slump" phenomenon of stock prices caused by the sudden release of bad news that has been concealed for a long time (Jin and Myers, 2006; Hutton et al., 2009). Stock price crash will not only bring huge losses to investors' personal wealth, but also seriously affect the healthy development of the capital markets. Consequently, research on stock price crash risk has attracted widespread attention from academics, practitioners, and regulatory authorities. In China's stock market, the phenomenon of "boom and slump" is particularly evident. Due to the relatively weak corporate governance, ineffective legal enforcement, and the lack of external independent audits, listed firms' information transparency is low and their stock price stability is poor (Piotroski et al., 2015; Liang et al., 2020). Especially during the "stock market crash" in 2015, the phenomenon of "thousand-share price falling" greatly affected investor confidence and capital market stability (Han and Liang, 2017; Ahmed and Huo, 2019). Therefore, examining the influencing factors of stock price crash risk is helpful to improve corporate governance, information environments, and establish a stable capital market.

The political and social upheaval, China's Cultural Revolution, greatly affected people[39]. The instability and uncertainty brought on by the Revolution may have had a long-lasting impact on those who lived through it, influencing their risk-taking behaviour and decision-making. For individuals who experienced such significant uncertainty and insecurity in early life, they may have had developed a heightened sense of risk aversion or a deep understanding of the importance of stability. Literature suggests that individuals exposed to adverse early-life experiences exhibit higher risk aversion and higher sensitivity to potential losses (Callen et al., 2014; Kim and Lee, 2014). It is expected that CEOs with the early-life Cultural Revolution experience would be more risk-averse and less likely to conceal bad news. Thus, we propose that CEOs' early-life experience is associated with lower stock price crash risk.

Moreover, we expect that litigation risk moderates the relation between CEOs' early-life experience and stock price crash risk. Litigation risk is an important concern to listed firms, and litigation has many negative effects on them. Litigation usually makes firms bear the reputation damages, legal costs, capital cost and results in economic losses (Helland, 2006; Fich and Shivdasani, 2007; Laux, 2010; Arena, 2018). For example, litigation would lead to a decrease of firm performance (Wu et al., 2020; Malm et al., 2023), an increase of stock price volatility (Firth et al., 2011), a higher probability of financial debt risk (Arena, 2018), a higher possibility of the controlling shareholder's exit (Liu et al., 2022), and the losses of shareholders' wealth (Bhagat et al., 1998). Thus, firms will be associated with high uncertainty and potential losses once they are exposed to litigation. It is expected that the risk-averse attitude of CEOs with early-life experience may be more pronounced in an environment with higher litigation risk. Therefore, we expect that CEOs who experienced the Cultural Revolution in their early

[39] Nearly 30 million people experienced political persecutions to some extent (Walder, 2015).

life are more risk-averse and less likely to hoard bad news, thus leading to lower stock price crash risk, especially in firms with higher litigation risk.

Using a large sample of Chinese A-share firms listed on the Shanghai and Shenzhen Stock Exchanges from 2003 to 2021, we find that CEOs' early-life experience are significantly and negatively associated with stock price crash risk. Our finding indicates that CEOs who experienced the Cultural Revolution in their early life are more risk-averse and less likely to conceal bad news, thus resulting in lower future stock price crash risk. We also find that such a negative association is more salient in firms with higher litigation risk, e.g., when firms are subjected to major lawsuits, in high-litigation risk industries, and in provinces with better legal development. These results suggest that litigation risk moderates the negative association between CEOs' early-life experience and stock price crash risk.

Multiple approaches are used to justify the causal effect of CEOs' early-life experience on stock price crash risk, including a multiple fixed effects model, a PSM analysis, a DiD approach, and placebo tests. The results are robust after addressing different types of endogeneity concerns. Further, we employ the ratio of the population that was involved in the "send-down[40]" movement in each province to proxy the intensity of the Cultural Revolution in the CEO's birthplace. The results show that the more severe the CEOs exposed to the Cultural Revolution, the more pronounced the negative impact on stock price crash risk. In addition, the channel analysis indicates that CEOs with early-life experience tend to exhibit more risk-averse behaviours, e.g., they tend to reduce earnings manipulation[41] and decrease tax avoidance[42],

[40] The "send-down" movement was a very important political movement during the Cultural Revolution. It resulted in one-third of urban adolescents, approximately 17 million youths, being sent to the countryside for manual labour for up to 10 years during the period 1966–1976 (Li et al., 2010).
[41] Firms that engage in accrual-based earnings management are more likely to have stock price crash risk (Hutton et al., 2009; Kim and Zhang, 2014). Thus, decreasing accrual-based earnings management can be an important mechanism for firms to reduce stock price crash risk.
[42] Corporate tax avoidance can increase stock price crash risk because aggressive tax strategies provide managers with the means to hide negative information (Kim et al., 2011a). Therefore, reducing corporate tax avoidance is a effective mechanism to mitigate crash risk.

which explains the mitigating effect of CEOs' early-life Cultural Revolution experience on stock price crash risk.

This study contributes to the literature in two ways. First, our investigation contributes to the developing research examining the influence of CEOs' early-life adverse experiences on firm activities. Based on the upper echelons theory and the imprinting theory, we document that CEOs who experienced China's Cultural Revolution in early life are more risk-averse and less likely to withhold bad news, and thereby are associated with lower future stock price crash risk. Prior studies have discussed CEOs' war experience (Malmendier et al., 2011; Choi and Jung, 2021), disaster experience (Bernile et al., 2017; Chen et al., 2021), the great depression experience (Malmendier and Nagel, 2011; Malmendier et al., 2011), poverty experience (Zhang et al., 2022b), and the famine experience (Long et al., 2020; Tian et al., 2023) on their risk preferences and decision-making. However, whether traumatic early-life experiences would make CEOs more risk-averse or risk-taking is still an ongoing debate. On the one hand, early-life disaster experiences may help CEOs to better deal with risky situations and make them have higher risk tolerance. Literature indicates that adverse early-life experiences lead to aggressive financing and investment policies (Bernile et al., 2017), more bad news withholding (Chen et al., 2021), and more risky R&D investment (Gao et al., 2021). On the other hand, CEOs who experienced an early-life adverse event would be more sensitized to the consequences of taking risks, and thus be more risk averse, thereby are associated with more conservative corporate policies (Feng and Johansson, 2018; Choi et al., 2021), higher accounting conservatism (Hu et al., 2020), better firm information transparency (Choi and Jung, 2021), and lower strategic risk-taking behaviours (Tian et al., 2023). Our empirical results add evidence to this debate. Moreover, our study examines the moderating effects of litigation risk on the documented negative association and finds that CEOs with early-life

experience exhibit more risk-averse behaviours when subjected to strong litigation risk to reduce potential losses.

Second, this study contributes to the literature on the determinants of stock price crash risk. Prior studies have examined the influencing factors that affect stock price crash risk mainly from accounting information characteristics (Hutton et al., 2009; Kim and Zhang, 2014; Chen et al., 2017; Kim et al., 2019), institutional investors (An and Zhang, 2013; Callen and Fang, 2013; Fan and Fu, 2020), managerial demographic characteristics (Andreou et al., 2017; Li and Zeng, 2019; Al-Mamun et al., 2020), auditor (Callen and Fang, 2017; Yeung and Lento, 2018), corporate tax avoidance (Kim et al., 2011a), religion (Callen and Fang, 2015), social trust (Li et al., 2017; Qiu et al., 2020), short sale threat (Deng et al., 2020), gambling preferences (Ji et al., 2021). Based on the upper echelon theory and imprint theory, this study investigates the impact of CEOs' early-life Cultural Revolution experience on stock price crash risk, which expands the studies on the determinants of stock price crash risk.

The remainder of the essay is organized as follows: Section 4.2 discusses the literature review and hypothesis development. Section 4.3 describes the data, variables construction, and the regression model. Section 4.4 introduces the empirical results. Section 4.5 is the conclusion.

4.2. Literature review and hypothesis development

4.2.1. The determinants of stock price crash risk

The formation of the stock price crash risk has mainly been explained by principal-agent theory and information asymmetry theory from the firm-level perspectives. The "information hiding hypothesis" proposed by Jin and Myers (2006) is widely accepted by scholars. This hypothesis documents that the formation mechanism of stock price crash risk can be explained from two views: agency theory and information asymmetry. The agency theory suggests that firm managers will selectively disclose information out of their personal interests, career

concerns, etc., that is, "report the good news but not the bad news", which will lead to information asymmetry about the company in the capital markets. However, the general situation of the firm based on asymmetric information will overestimate the firm value, so that the stock price cannot reflect the real operating status of the company. Moreover, the amount of bad news managers can withhold is limited (Jin and Myers, 2006). When the accumulation of concealed bad news passes a threshold, it will be revealed to the markets at once. The sudden appearance of a large number of bad news about the company in the markets will trigger the panic of individual and institutional investors, leading to the collective selling of stocks and further a substantial crash in stock prices.

Information asymmetry is an important prerequisite for stock price crash. In companies with more opaque financial reporting and a less transparent information environment, the management is more likely to hoard bad news, thereby leading to stock price crash (Jin and Myers, 2006; Hutton et al., 2009). Previous literature has shown that financial reporting quality is negatively associated with crash risk. For example, Hutton et al. (2009) employ accumulated accruals to proxy for firm-level earnings management and find that firms with more opaque financial reporting are more prone to crash risk. Francis et al. (2016) suggest that firms that engage in real-earnings management are associated with more stock price crash risk. Chen et al. (2017a) document that firms with a high level of earnings smoothing tend to have high stock price crash risk. In addition, corporate tax avoidance is a specific method used by managers to manage earnings. Kim et al. (2011a) find that corporate tax avoidance is positively associated with stock price crash risk, highlighting that aggressive tax strategies provide managers with the means to hide negative information, thus increasing crash risk. In addition, there are some mitigating factors that can decrease information asymmetry and reduce stock price crash risk. For instance, firms with a higher level of accounting conservatism tend to have reduced stock price crash risk because conditional conservatism can limit managers' incentive and ability to

overstate performance and hide bad news from investors (Kim and Zhang, 2016). Firms with higher corporate social responsibility (CSR) deliver more responsible financial reporting and exhibit less earnings management (Kim et al., 2012), and thereby are negatively associated with future crash risk (Kim et al., 2014). Andreou et al. (2016) find that better corporate governance systems reduce the information asymmetry between the firm and its external stakeholders, thus leading to a lower likelihood of future stock price crash risk.

Managerial disclosure preference is definitely a key determinant of stock price crash risk. Managers are incentivized by their self-interest (such as compensation, reputation) and career concerns to hide bad news, which largely affects stock price crash risk. For instance, Kim et al. (2011b) find that the ratio of the CFO option portfolio value to stock price is associated with higher crash risk. Xu et al. (2014) suggest that managers' excess perk consumption increases crash risk. Jia (2018) documents that the pay gaps between the CEO and other senior executives lead to higher stock price crash risk.

A growing number of studies pay attention to the implication of managerial attributes on stock price crash risk because managers' idiosyncratic characteristics shape their decision choices regarding the withholding of bad news. CEO overconfidence (Kim et al., 2016), age (Andreou et al., 2017), gender (Li and Zeng, 2019), power (Al-Mamun et al., 2020), network centrality (Krishnamurti et al., 2021), marital status (Kim et al., 2022), and trustworthiness (Gu et al., 2022) are significantly associated with the tendency to hoard bad news. For example, Kim et al. (2016) find that overconfident CEOs tend to overestimate their investment projects' returns and ignore privately observed negative feedback. Thus, their investments' bad performance accumulates which lead to stock price crashes. Andreou et al. (2017) argue that younger CEOs have financial incentives to keep negative information in their earlier career, resulting in higher stock crashes. Li and Zeng (2019) document that firms with female CEOs

are less likely to experience stock price crash risk due to the risk-averse attitude of female CEOs.

Although managers have incentives to conceal bad news, holding bad news can also take significant risks for them. For example, managers who hide negative information through financial misrepresentation or manipulation information disclosure may face greater risk in the future. Once false statements or manipulative behaviour are exposed, they face shareholder lawsuits or criminal charges and may face future employment restrictions (Karpoff et al., 2008a).

4.2.2. CEO early-life experience and stock price crash risk

According to the upper echelons theory (Hambrick and Mason, 1984; Hambrick, 2007) and the imprinting theory (Marquis and Tilcsik, 2013), CEO's early-life experience especially traumatic experience is a key factor in determining firm risk-taking behaviour and decision-making. The upper echelon theory suggests that the characteristics and experiences of top executives have a direct impact on the strategies and outcomes of organizations (Hambrick and Mason, 1984; Hambrick, 2007). Based on this theory, the values, experiences, and personal characteristics of top executives shape the culture and overall direction of the organization. Thus, the early-life experiences of a CEO can be a powerful determinant of their risk-taking behaviour. In addition, the imprinting theory posits that individuals develop their values and beliefs based on their early-life experiences, particularly those that occur during times of trauma (Marquis and Tilcsik, 2013). These important and adverse experiences can have a long-lasting impact on an individual's approach to risk-taking, thereby influencing their willingness to engage in risky behaviours.

A viewpoint on the relationship between traumatic experience and risk preference is that individuals who experienced traumatic events during their early life may make them to

"perceive the world to be a riskier place" (Lerner and Keltner, 2001; Cameron and Shah, 2015). For example, the fear of trauma makes people express pessimistic risk estimates and risk-averse choices (Lerner and Keltner, 2001). Callen et al. (2014) document that individuals exposed to traumatic experiences (violence) exhibit an increased preference for certainty. Kim and Lee (2014) find that individuals exposed to the traumatic event (Korean War) tend to be more risk-averse. Therefore, it's expected that individuals who experienced traumatic events in early life tend to be more sensitized to the consequences of risk-taking, and thus have a higher risk aversion.

The Cultural Revolution was a period of political and social upheaval in mainland China that lasted from 1966 to 1976 (MacFarquhar, 1974). It was characterized by widespread turmoil which affected China socially and economically. Almost every Chinese citizen was affected to some extent during its worst period (Walder, 2015). Many traditional Chinese values and practices were criticized and cultural production was tightly controlled and had to adhere to strict revolutionary standards (Bai and Wu, 2020). Moreover, factories and schools were shut down or disrupted, leading to a decline in productivity and education time (Meng and Gregory, 2002). The chaos and instability of the Cultural Revolution contributed to a decade of economic stagnation and hardship in China. The Revolution was later officially regarded as a period of "severe turmoil."[43] Thus, the instability and uncertainty brought on by the Cultural Revolution may have had a lasting impact on those who lived through it, influencing their risk-taking behaviour and decision-making processes.

Given its significant influences on individuals, the Cultural Revolution is an appropriate natural imprinting event to be selected for proxying the CEOs' early-life experience. Such adverse life experience can generate long-term imprints that affect CEOs' future risk

[43] The official "Resolutions on Certain Questions in the History of the Party since the Founding of the PRC" stated: [the Cultural Revolution] was an upheaval that was launched and manipulated by certain cliques, resulting in severe turmoil to the Party and the Chinese people.

preferences and decision-making. Also, such imprints generated from the early-life Cultural Revolution experience can be more enduring and pronounced. Based on upper echelons theory and imprinting theory, CEOs who experienced such an adverse historical event in early life may have developed a heightened sense of risk aversion and they would be more risk-averse when managing firms. There is empirical evidence that CEO's early-life experience is an essential personal attribute that significantly affects managerial risk-taking behaviour and stock price crash risk. Chen et al. (2021) suggest that CEOs with early-life disasters experience have higher risk tolerance and are more willing to accept the risks associated with bad news hoarding, thus are associated with higher stock price crash risk. In contrast, Long et al. (2020) find that firms with CEOs who experienced early-life famine experience lower stock price crash risk since these CEOs are more risk-averse. Overall, CEOs with early-life experience will be more sensitized to the risks of bad news hoarding, which in turn, reduces future stock price crash risk. Based on the above discussions, we propose our first hypothesis as below:

H1: CEOs with early-life Cultural Revolution experience are negatively associated with stock price crash risk.

4.2.3. The moderating effects of litigation risk

Along with the increase of market uncertainty and the advancement of rule of law, the overall litigation risk of Chinese enterprises is increasing constantly. Litigation risk for firms refers to the potential legal and financial risks that a company may face as a result of being involved in legal disputes or litigation. Litigation risk can arise from a variety of sources, including disputes with customers, suppliers, employees, or regulatory authorities, as well as intellectual property infringement claims and product liability lawsuits. Listed firms are particularly vulnerable to litigation risk because they operate in a highly regulated environment and are subject to a wide range of laws and regulations, both domestic and international. In

addition, these companies are often high-profile and attract public scrutiny, which can increase the likelihood of legal challenges and disputes.

For listed firms, litigation risk can be a particular concern due to the potential negative impacts on the company's reputation, financial value, share price, and shareholder wealth (Lowry and Shu, 2002; Prince and Rubin, 2002; Fich and Shivdasani, 2007; Karpoff et al., 2008b). On the one hand, litigation brings huge capital cost to enterprises. Legal disputes and litigation can result in significant legal costs, including legal expenses, settlement payments, and damages awarded by courts or arbitration panels (Lowry and Shu, 2002; Hutton et al., 2014; Arena and Julio, 2015). On the other hand, litigation can lead to human cost consumption. Litigation can be a time-consuming and distracting process, diverting management's attention from business operations which brings costs such as emotional burden, time and effort consumption, and relationship deterioration (Laux, 2010). The empirical evidence documents that litigation risk is associated with reduced firm performance (Wu et al., 2020; Malm et al., 2023), higher cost of debt (Arena, 2018; Qin et al., 2021), higher stock price volatility (Firth et al., 2011), more IPO underpricing (Lowry and Shu, 2002), and the losses of shareholders' wealth (Bhagat et al., 1998). Overall, litigation risk may lead to many negative consequences, and it is an important concern to listed firms.

As discussed before, CEOs who experienced the Cultural Revolution in their early life are more cautious and risk-averse, hence they are unwilling to take the risks associated with stock price crash risk. Therefore, when CEOs with early-life experience are subjected to higher corporate litigation risk, their risk-averse attitude could be more pronounced in order to reduce potential future losses. Firms that are involved in major lawsuits, that operate in industries with high-litigation risk, and that are located in regions with strong legal environments tend to have increased litigation risk. We expect that when facing higher litigation risk, firms with CEOs

who experienced early-life Cultural Revolution experience are less likely to engage in bad news hoarding.

Accordingly, we propose the following hypothesis:

H2: Litigation risk moderates the relation between CEOs' early-life Cultural Revolution experience and stock price crash risk.

4.3. Research design

4.3.1. Data and sample

The initial sample of this study includes all Chinese companies listed on the A-share market in the Shanghai and Shenzhen Stock Exchanges from 2003 to 2021. The sample period is from 2003 to 2020 for CEOs' early-life revolution experience measure and control variables, and from 2004 to 2021 for stock price crash risk measures. We manually collected the missing CEO birthplace information through Google and Baidu browsers if it is not available in the CSMAR database. Firms' financial data and CEOs' other characteristic data are collected from the CSMAR database.

Following prior literature, we exclude (1) financial firms, (2) special treatment (ST) firms, and (3) firm-year observations with missing data for control variables. We further follow Hu et al. (2020) to remove CEOs who were not Chinese citizens from our sample because it's unable for us to identify whether they experienced Cultural Revolution or not. To avoid the impact of outliners, all continuous variables are winsorized at the 1% and 99% levels. The final sample includes 3,067 listed firms that consist of 29,115 firm-year observations.

4.3.2. Stock price crash risk

Following Chen et al. (2001), Kim et al. (2011a), and Kim and Zhang (2016), we construct two measures of firm stock price crash risk, including the negative conditional return skewness (*Ncskew*) and the down-to-up volatility of firm-specific weekly returns (*Duvol*). Both measures

are based on firm-specific weekly returns (denoted by $W_{i,t}$) calculated as the natural logarithm of 1 plus the residual term ($\varepsilon_{j,\tau}$) through the estimation of the following extended market index model:

$$r_{i,t} = \alpha + \beta_{1,i}\, r_{m,t-2} + \beta_{2,i}\, r_{m,t-1} + \beta_{3,i}\, r_{m,t} + \beta_{4,i}\, r_{m,t+1} + \beta_{5,i}\, r_{m,t+2} + \epsilon_{i,t} \qquad (4.1)$$

where $r_{i,t}$ is the return on stock i in week t, and $r_{m,t}$ is the return on the value-weighted market index in week t. The lead and lag terms for the market index return are included to allow for nonsynchronous trading (Dimson, 1979). The firm-specific weekly return for firm i in week t (Wi,t) is calculated as the natural logarithm of one plus the residual return from Equation (4.2); that is $W_{i,t} = \ln(1+\varepsilon_{i,t})$.

The first measure of crash risk is the negative conditional skewness of firm-specific weekly returns over the fiscal year (*Ncskew*). *Ncskew* is calculated by taking the negative of the third moment of firm-specific weekly returns for each year and dividing it by the standard deviation of firm-specific weekly returns raised to the third power. Specifically, we calculate *Ncskew* for each firm i in year t as:

$$N\text{cskew}_{i,t} = -[n(n-1)^{3/2}\, \Sigma W_{i,t}{}^3]/[(n-1)(n-2)(\Sigma W_{i,t}{}^2)^{3/2}] \qquad (4.2)$$

where n is the number of trading weeks on stock i in year t. A higher value for *Ncskew* corresponds to a stock being more "crash prone" and vice versa.

The second measure of crash risk is the down-to-up volatility (*Duvol*), which is calculated as:

$$D\text{uvol}_{i,t} = \ln\, \{[(n_u-1)\Sigma_{\text{down}}\, W_{i,t}{}^2] \,/\, [(n_d-1)\Sigma_{\text{up}}\, W_{i,t}{}^2]\} \qquad (4.3)$$

where n_u and n_d are the numbers of up and down weeks, respectively. A higher value of *Duvol* indicates greater crash risk.

4.3.3. CEOs' early-life experience

We construct *CR* variable as the measure of CEOs' early-life Cultural Revolution experience. *CR* is a dummy variable that equals 1 if the CEO experienced China's Cultural Revolution (1966-1976) at the age of 13 and 18, and 0 otherwise. This study defines CEOs born between 1948[44] and 1963[45] as the CEOs who experienced the revolution in their adolescence period. First, China's Cultural Revolution was an influential socio-political movement that occurred between 1966 and 1976. Second, previous physiology studies document that adolescence (13-18 years old) is one of the most critical stages for children to recognize and understand the world, preserve permanent memory, and form their character (Piaget, 2003; Piaget and Inhelder, 2008; Wadsworth, 1996). Krosnick and Alwin (1989) document that adolescence is the most sensitive period for individuals to form values, and major social events happened during adolescence will have a persistent impact on the experiencers' implicit psychological traits. Thus, the adolescence cohort can be more likely to be affected by political violence than those who were in infancy, or in childhood who may get better protections from their family during the Cultural Revolution.

4.3.4. Control variables

Following prior studies (Xu et al., 2014; Long et al., 2020; Ji et al., 2021), we control for a variety of variables that may affect future stock price crash risk. First, we include the lagged variable of crash risk ($Nckew_t$ or $Duvol_t$). Second, we include firm-level control variables in the model. *Ret* is the average firm-specific weekly return in the fiscal year. *Sigma* is the standard deviation of firm-specific weekly returns in the fiscal year. *Dturn* is the detrended average monthly stock turnover value. *Size* is defined as the natural logarithm of total assets. *Lev* is a

[44] A person born in 1948 will be age 18 in 1966.
[45] A person born in 1963 will be age 18 in 1976.

firm's financial leverage that is calculated as the book value of total debt divided by the book value of total assets. *ROA* is defined as the net income divided by total assets. *Growth* is the growth in sales income. *Big4/10* is a dummy variable that equals 1 if a firm is audited by an international Big 4 audit firm or a domestic Big 10 audit firm, and 0 otherwise. *Board size* is calculated as the natural logarithm of the total number of directors on the board. *Independence* is the ratio of the number of independent directors to the total number of directors. *Top1* refers to the percentage ownership of the largest shareholder. *BM* is the book-to-market ratio. *Firm age* is calculated as the natural logarithm of the number of years since the firm was founded at every year end. *SOE* is a dummy variable that equals 1 if the ultimate controller is an SOE or government agency, and 0 otherwise. *absACC* is the absolute value of the estimated residuals from the adjusted-Jones model (Dechow et al., 1995).

We also include CEO characteristics variables such as *CEO age, CEO gender,* and *CEO duality*. *CEO age* is the natural logarithm of the CEO's age. *CEO gender* is a dummy variable that equals 1 if the CEO is male, and 0 otherwise. *CEO duality* is a dummy variable that equals 1 if the CEO and board chair positions are held by the same person, and 0 otherwise. Appendix A presents the definition of the variables in detail.

4.3.5. Model specification

To examine the influence of CEOs' early-life Cultural Revolution experience on stock price crash risk, we construct the following regression model:

$$CrashRrisk_{i,t+1} = \beta_0 + \beta_1 CR_{i,t} + \sum_k \beta_k Controls_{k,i,t} + Firm + Year + \epsilon_{i,t+1} \quad (4.4)$$

where $Nckew_{t+1}$ and $Duvol_{t+1}$ are used to proxy crash risk. Firms with a higher $Nckew_{t+1}$ or $Duvol_{t+1}$ tend to have higher future stock price crash risk. $CR_{i,t}$ is a dummy variable that equals 1 if the CEO experienced China's Cultural Revolution between the age of 13 and 18, and 0 otherwise. $Controls_{k,i,t}$ is a set of control variables on a yearly basis, including $Ret_{i,t}$, $Sigma_{i,t}$,

$Dturn_{i,t}$, $Size_{i,t}$, $Lev_{i,t}$, $ROA_{i,t}$, $Growth_{i,t}$, $Big4/10_{i,t}$, $Board\ size_{i,t}$, $Independence_{i,t}$, $Top1_{i,t}$, $BM_{i,t}$, $Firmage_{i,t}$, $SOE_{i,t}$, $absACC_{i,t}$, $CEO\ age_{i,t}$, $CEO\ gender_{i,t}$, $CEO\ duality_{i,t}$. Year and firm fixed effects are included in all regressions.

4.4. Empirical results

4.4.1. Descriptive statistics

Table 4.1 reports the descriptive statistics of the variables employed in this study. The mean and median of $Ncskew_{t+1}$ are -0.286 and -0.246, and the mean and median of $Duvol_{t+1}$ are -0.189 and -0.186, respectively. The standard deviation of $Ncskew_{t+1}$ and $Duvol_{t+1}$ is 0.703 and 0.471, respectively, suggesting a high variance in stock price crash risk across observations. The statistics of crash risk measures are within similar ranges with previous studies, such as Long et al. (2020), Zhou et al. (2021), and Gu et al. (2022). On average, *CR* is 0.391 which indicates that 39.1% of CEOs in our sample firms experienced the Cultural Revolution between 13 and 18 years old. 94.3% of CEOs are male and 22.4% of CEOs also hold the position of Chairman of the board. Also, 47.1% of sample companies are SOEs. The descriptive statistics of other variables[46] are also in line with prior studies (Long et al., 2020; Zhou et al., 2021).

Table 4.1. Descriptive statistics

This table reports the descriptive statistics of the main variables. The sample contains 29,115 observations from 3,067 firms listed on the Shanghai and Shenzhen stock exchanges from 2003 to 2021. For CEOs' early-life Cultural Revolution experience measure and control variables, the sample period is from 2003 to 2020, while for the stock price crash risk measures, the sample period is from 2004 to 2021. Detailed definitions of variables are shown in Appendix A.

	(1) N	(2) Mean	(3) SD	(4) P25	(5) Median	(6) P75
$Ncskew_{t+1}$	29,115	-0.286	0.703	-0.670	-0.246	0.133
$Duvol_{t+1}$	29,115	-0.189	0.471	-0.501	-0.186	0.124
CR_t	29,115	0.391	0.488	0.000	0.000	1.000
$Ncskew_t$	29,115	-0.272	0.697	-0.651	-0.235	0.142
$Duvol_t$	29,115	-0.181	0.473	-0.494	-0.180	0.131

[46] The correlation matrixes for the variables are shown in Appendix C.

Ret_t	29,115	0.003	0.011	-0.004	0.002	0.009
$Sigma_t$	29,115	0.064	0.024	0.047	0.059	0.076
$Dturn_t$	29,115	-0.072	0.449	-0.224	-0.012	0.148
$Size_t$	29,115	22.040	1.241	21.131	21.869	22.764
Lev_t	29,115	0.446	0.199	0.293	0.450	0.599
ROA_t	29,115	0.037	0.053	0.013	0.034	0.062
$Growth_t$	29,115	0.184	0.415	-0.015	0.117	0.284
$Big4/10_t$	29,115	0.464	0.499	0.000	0.000	1.000
$Board\ size_t$	29,115	2.160	0.203	2.079	2.197	2.197
$Independence_t$	29,115	0.369	0.052	0.333	0.333	0.400
$Top1_t$	29,115	0.355	0.150	0.236	0.333	0.460
BM_t	29,115	1.075	1.041	0.427	0.741	1.322
$Firm\ age_t$	29,115	2.762	0.393	2.565	2.833	3.045
SOE_t	29,115	0.471	0.499	0.000	0.000	1.000
$absACC_t$	29,115	0.075	0.077	0.023	0.052	0.099
$CEO\ age_t$	29,115	3.875	0.137	3.784	3.892	3.970
$CEO\ gender_t$	29,115	0.943	0.232	1.000	1.000	1.000
$CEO\ duality_t$	29,115	0.224	0.417	0.000	0.000	0.000

4.4.2. Baseline results

Table 4.2 reports the results of the regression on the impact of CEOs' early-life experience on stock price crash risk based on Equation (4.4). As shown in Column (1), the coefficient on *CR* is -0.044 and is statistically significant at the 1% level[47]. The coefficient on *CR* in Column (2) is -0.022 which is negative and statistically significant at the 5% level[48]. The results show that CEOs with the Cultural Revolution experience are significantly and negatively associated with both measures of crash risk. These findings suggest that CEOs who experienced the Cultural Revolution in their early life are more risk-averse and less likely to hoard bad news, thereby leading to a lower level of future stock price crash risk. Our hypothesis H1 is supported.

[47] We follow Fauver et al. (2017) to calculate the economic significance, for example in Column (1), a firm's stock price crash risk ($Ncskew_{t+1}$) is 15.38% (-0.044/-0.286) lower when it is managed by a CEO who experienced the Cultural Revolution in early life compared with those that are not.

[48] As for economic significance, a firm's stock price crash risk ($Duvol_{t+1}$) is 11.64% (-0.022/-0.189) lower when it is managed by a CEO who experienced the Cultural Revolution in early life compared with those that are not.

As for control variables, *Ret* and *Size* are significantly associated with higher future crash risk, which is consistent with the findings of Chen et al. (2001). *Top1 and Firmage* are significantly and negatively associated with crash risk, consistent with the findings of Ji et al. (2021). In addition, *BM* has a negative and significant coefficient, indicating that crash risk is lower for firms with higher a book-to-market ratio, and this might be due to the undervaluation of those stocks.

Table 4.2. CEO early-life experience and stock price crash risk

This table reports the impact of CEOs' early-life experience on stock price crash risk in Chinese listed firms. This table reports the coefficients of the regression as follows:

$$CrashRrisk_{i,t+1} = \beta_0 + \beta_1 CR_{i,t} + \sum_k \beta_k Controls_{k,i,t} + Firm + Year + \epsilon_{i,t+1}$$

where $Nckew_{t+1}$ and $Duvol_{t+1}$ are measures to proxy stock price crash risk. Firms with a higher $Nckew_{t+1}$ or $Duvol_{t+1}$ tend to have higher crash risk. $CR_{i,t}$ is a dummy variable that equals 1 if the CEO experienced the Cultural Revolution between the age of 13 and 18, and 0 otherwise. $Controls_{k,i,t}$ is a set of control variables on a yearly basis, including $Ret_{i,t}$, $Sigma_{i,t}$, $Dturn_{i,t}$, $Size_{i,t}$, $Lev_{i,t}$, $ROA_{i,t}$, $Growth_{i,t}$, $Big4/10_{i,t}$, $Board\ size_{i,t}$, $Independence_{i,t}$, $Top1_{i,t}$, $BM_{i,t}$, $Firmage_{i,t}$, $SOE_{i,t}$, $absACC_{i,t}$, $CEO\ age_{i,t}$, $CEO\ gender_{i,t}$, $CEO\ duality_{i,t}$. All continuous variables are winsorized at the 1% level in each tail, and the detailed definitions of all variables are shown in Appendix A. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
	$Ncskew_{t+1}$	$Duvol_{t+1}$
CR_t	-0.044***	-0.022**
	(-2.823)	(-2.080)
$Ncskew_t$	-0.057***	
	(-8.780)	
$Duvol_t$		-0.064***
		(-9.950)
Ret_t	7.171***	4.764***
	(9.659)	(9.522)
$Sigma_t$	-0.343	-0.600***
	(-1.037)	(-2.714)
$Dturn_t$	-0.033***	-0.018**
	(-2.652)	(-2.113)
$Size_t$	0.059***	0.022***
	(5.434)	(3.039)
Lev_t	-0.074*	-0.035
	(-1.672)	(-1.155)

ROA_t	0.214**	0.139**
	(2.099)	(2.023)
$Growth_t$	-0.016	-0.013*
	(-1.525)	(-1.846)
$Big4/10_t$	-0.024**	-0.006
	(-1.965)	(-0.664)
$Board\ size_t$	-0.051	-0.008
	(-1.228)	(-0.305)
$Independence_t$	0.019	0.085
	(0.141)	(0.963)
$Top1_t$	-0.295***	-0.185***
	(-4.411)	(-4.115)
BM_t	-0.046***	-0.024***
	(-5.750)	(-4.368)
$Firmage_t$	-0.189***	-0.134***
	(-3.453)	(-3.641)
SOE_t	-0.059**	-0.049***
	(-2.301)	(-2.812)
$absACC_t$	0.097*	0.050
	(1.668)	(1.294)
$CEO\ age_t$	0.122**	0.058
	(2.258)	(1.599)
$CEO\ gender_t$	-0.019	-0.015
	(-0.740)	(-0.882)
$CEO\ duality_t$	0.022	0.011
	(1.378)	(1.016)
Constant	-1.014***	-0.265
	(-3.232)	(-1.257)
Firm FE	Yes	Yes
Year FE	Yes	Yes
Observations	29,115	29,115
Adjusted R^2	0.090	0.091

4.4.3. The moderating effects of litigation risk

In this subsection, we examine the moderating effects of litigation risk on the association between CEOs' early-life experience and stock price crash risk.

4.4.3.1. The moderating effects of firm-level litigation risk

To test hypothesis H2, we first examine the effect of CEOs' early-life experience on crash risk according to firm-level litigation risk. Following prior studies (Lowry and Shu, 2002;

Aharony et al., 2015; Qin et al., 2021), we employ *Litigation dummy*, which is a dummy variable that equals 1 if the firm is involved in major litigation and arbitration cases in the fiscal year, and 0 otherwise[49]. Firms that are subject to major litigation and arbitration cases are associated with higher litigation risk. Litigation risks have many negative impacts on listed firms, for example, firms are found to face uncertainty risks once they are exposed to major lawsuits (Liu et al., 2022). Litigation usually makes firms bear reputation damages, legal costs, capital cost, and economic losses (Helland, 2006; Fich and Shivdasani, 2007; Laux, 2010; Arena, 2018). Therefore, we expect that CEOs with early-life experience are more risk-averse and cautious when facing higher litigation risk, thus they have stronger incentives to mitigate stock price crash risk.

We divide our sample into two subsamples (*Litigation dummy*=1 and *Litigation dummy*=0) according to whether the firm is involved in major litigation and arbitration cases in the fiscal year and then we re-run Equation (4.4). Table 4.3 presents the results of subsample analyses based on firm-level litigation risk. As shown in Columns (1) and (2), the negative associations between *CR* and both crash risk measures ($Ncskew_{t+1}$ and $Duvol_{t+1}$) are statistically significant at the 5% level for the *Litigation dummy*=1 subsamples[50]. However, the coefficients on *CR* are insignificant for the subsamples without firm-level major lawsuits. The results indicate that since major lawsuits introduce higher uncertainty risk, companies having CEOs with the early-life Cultural Revolution experience are less likely to hide bad news to reduce future potential losses, thus leading to a lower level of crash risk.

[49] The data is collected from the litigation and arbitration summary table (LA_SUMMARY) in CSMAR database. The sample period ends at the end of year 2018 because of the of database limitation.

[50] In terms of the economic significance, for example in Column (1), a firm's crash risk ($Ncskew_{t+1}$), when facing major lawsuits, is 31.39% [coefficient on *CR* (-0.097) / mean value of $Ncskew_{t+1}$ when *Litigation dummy* =1 (-0.309)] lower when it is managed by a CEO with early-life Cultural Revolution experience compared with those that are not.

Table 4.3. The moderating effects of corporate litigation risk

This table shows the regression results of subsample analyses based on firm-level litigation risk. *Litigation dummy* is a dummy variable that equals 1 if the firm is involved in major litigation and arbitration cases in the fiscal year and 0 otherwise. *CR*, *Crashrisk* ($Nckew_{t+1}$ and $Duvol_{t+1}$) and Controls are the same as in Table 4.2. Appendix A presents the detailed variable definitions. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Litigation dummy=1	*Litigation dummy*=1	*Litigation dummy*=0	*Litigation dummy*=0
	(1)	(2)	(3)	(4)
	$Ncskew_{t+1}$	$Duvol_{t+1}$	$Ncskew_{t+1}$	$Duvol_{t+1}$
CR_t	-0.097**	-0.075**	-0.026	-0.008
	(-1.979)	(-2.183)	(-1.079)	(-0.491)
$Ncskew_t$	-0.136***		-0.092***	
	(-7.639)		(-10.773)	
$Duvol_t$		-0.155***		-0.104***
		(-8.496)		(-11.668)
Ret_t	-0.036	-0.055	-0.053	-0.045*
	(-0.466)	(-0.985)	(-1.439)	(-1.708)
$Sigma_t$	0.290	0.218	0.024	0.016
	(1.545)	(1.642)	(0.295)	(0.267)
$Dturn_t$	0.034	-0.006	0.038*	0.029*
	(0.671)	(-0.167)	(1.733)	(1.849)
$Size_t$	-0.008	-0.002	-0.019	-0.013
	(-0.299)	(-0.085)	(-1.275)	(-1.253)
Lev_t	0.332*	0.144	0.327***	0.237***
	(1.899)	(1.163)	(4.454)	(4.546)
ROA_t	-0.016	-0.005	-0.022	-0.009
	(-0.428)	(-0.167)	(-1.227)	(-0.714)
$Growth_t$	0.092	0.023	0.003	0.018
	(0.688)	(0.246)	(0.043)	(0.403)
$Big4/10_t$	-0.306	-0.147	-0.385***	-0.227***
	(-1.333)	(-0.903)	(-3.501)	(-2.911)
$Board\ size_t$	-0.019	-0.020	-0.065***	-0.045***
	(-0.720)	(-1.088)	(-4.653)	(-4.561)
$Independence_t$	-0.052	0.060	-0.376***	-0.269***
	(-0.215)	(0.355)	(-3.737)	(-3.769)
$Top1_t$	0.045	0.028	-0.110***	-0.094***
	(0.501)	(0.437)	(-2.714)	(-3.243)
BM_t	0.137	0.170	0.099	0.058
	(0.923)	(1.624)	(1.303)	(1.083)
$Firmage_t$	-1.522	-0.755	-1.044*	-0.430
	(-1.213)	(-0.851)	(-1.900)	(-1.101)
SOE_t	-0.036	-0.055	-0.053	-0.045*
	(-0.466)	(-0.985)	(-1.439)	(-1.708)
$absACC_t$	0.290	0.218	0.024	0.016
	(1.545)	(1.642)	(0.295)	(0.267)
$CEO\ age_t$	-0.002	0.071	-0.083	-0.040
	(-0.012)	(0.677)	(-1.212)	(-0.827)
$CEO\ gender_t$	0.048	0.028	0.100***	0.058***
	(1.220)	(0.989)	(5.692)	(4.644)

CEO duality$_t$	0.029	0.049	0.028	0.007
	(0.096)	(0.233)	(0.172)	(0.060)
Constant	0.034	-0.006	0.038*	0.029*
	(0.671)	(-0.167)	(1.733)	(1.849)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	3,792	3,792	13,717	13,717
Adjusted R^2	0.135	0.123	0.127	0.121

4.4.3.2. The moderating effects of industry-level litigation risk

We then investigate the moderating effects of industry-level litigation risk on the association between CEOs' early-life experience and crash risk. Following Wang and Li (2016) and Wang et al. (2021), we construct a dummy variable which is *Industry-litigation risk* to measure industry-level litigation risk. Specifically, we classify the following industries as high litigation risk industries: drugs (CSRC industry code C-27), computers and office equipment (CSRC industry code C-39), electronic and other electrical equipment and components (except computers and equipment; CSRC industry code C-38), retail trade (CSRC industry code F-52), and computer programming, data processing, and other computer-related services (CSRC industry code I-65). Then, we construct *Industry-litigation risk*, which is a dummy variable that equals 1 if a firm operates in a high-litigation-risk industry, and 0 otherwise. Firms in these industries are expected to face higher potential litigation risk. Thus, firms operating in high litigation risk industries tend to face higher uncertainty. We expect that CEOs with the early-life Cultural Revolution experience would exhibit more risk-averse behaviours to avoid uncertainty and potential losses, thus leading to lower stock price crash risk.

We re-estimate Equation (4.4) on two subsamples (*Industry-litigation risk*=1 and *Industry-litigation risk*=0) in Table 4.4. As shown in Columns (1) and (2), the coefficients on *CR* are negative and statistically significant at least at the 5% level for *Industry-litigation risk*=1 subsamples. While the coefficients on *CR* are not statistically significant for the *Industry-litigation risk*=0 subsamples (Columns (3) and (4)). The results suggest that CEOs with early-

life Cultural Revolution experience are more risk-averse and less likely to hide bad news and hence reducing future crash risk when facing higher potential litigation risk. Therefore, CEOs' early-life experience has a greater impact on stock crash risk in industries with higher litigation risk.

Table 4.4. The moderating effects of industry litigation risk

This table shows the regression results of subsample analyses based on industry-level litigation risk. *Industry-litigation risk* is a dummy variable that equals 1 if a firm operates in a high-litigation-risk industry, and 0 otherwise. *CR*, *Crashrisk* ($Nckew_{t+1}$ and $Duvol_{t+1}$) and Controls are the same as in Table 4.2. Appendix A presents the detailed variable definitions. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Industry-litigation risk=1	*Industry-litigation risk*=1	*Industry-litigation risk*=0	*Industry-litigation risk*=0
	(1)	(2)	(3)	(4)
	$Ncskew_{t+1}$	$Duvol_{t+1}$	$Ncskew_{t+1}$	$Duvol_{t+1}$
CR_t	-0.064**	-0.057***	-0.032	-0.006
	(-2.062)	(-2.751)	(-1.519)	(-0.459)
$Ncskew_t$	-0.078***		-0.064***	
	(-6.396)		(-7.751)	
$Duvol_t$		-0.086***		-0.069***
		(-7.172)		(-9.035)
Ret_t	6.257***	4.378***	7.282***	4.769***
	(4.510)	(4.667)	(7.975)	(7.832)
$Sigma_t$	0.034	-0.424	-0.354	-0.587**
	(0.055)	(-1.029)	(-0.840)	(-2.216)
$Dturn_t$	-0.037*	-0.020	-0.033**	-0.018*
	(-1.714)	(-1.332)	(-1.983)	(-1.738)
$Size_t$	0.072***	0.013	0.061***	0.027***
	(3.310)	(0.894)	(4.059)	(3.040)
Lev_t	0.182**	0.103*	-0.131**	-0.069*
	(2.064)	(1.734)	(-2.190)	(-1.891)
ROA_t	0.533***	0.337**	0.079	0.060
	(2.643)	(2.475)	(0.520)	(0.661)
$Growth_t$	-0.056**	-0.040**	-0.014	-0.011
	(-2.384)	(-2.536)	(-1.064)	(-1.365)
$Big4/10_t$	-0.050**	-0.031*	-0.018	0.002
	(-2.141)	(-1.923)	(-1.088)	(0.159)
Board size$_t$	-0.050	0.024	-0.053	-0.017
	(-0.618)	(0.443)	(-0.967)	(-0.530)
Independence$_t$	-0.094	0.065	0.051	0.077
	(-0.365)	(0.376)	(0.287)	(0.737)
$Top1_t$	-0.208	-0.082	-0.296***	-0.191***
	(-1.511)	(-0.881)	(-3.488)	(-3.788)
BM_t	-0.057***	-0.021	-0.045***	-0.023***
	(-2.597)	(-1.440)	(-4.345)	(-3.823)
Firmage$_t$	-0.231**	-0.124*	-0.172**	-0.137***
	(-2.187)	(-1.745)	(-2.187)	(-3.081)

SOE_t	-0.119**	-0.077**	-0.037	-0.032
	(-2.515)	(-2.417)	(-0.977)	(-1.471)
$absACC_t$	0.197	0.097	0.056	0.025
	(1.586)	(1.156)	(0.789)	(0.558)
CEO age$_t$	0.040	0.033	0.138*	0.055
	(0.394)	(0.481)	(1.834)	(1.253)
CEO gender$_t$	-0.023	-0.020	-0.032	-0.022
	(-0.480)	(-0.609)	(-0.898)	(-1.035)
CEO duality$_t$	0.038	0.025	0.014	0.007
	(1.367)	(1.356)	(0.622)	(0.509)
Constant	-0.993	-0.195	-1.110***	-0.301
	(-1.613)	(-0.469)	(-2.620)	(-1.174)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	8,496	8,496	20,619	20,619
Adjusted R^2	0.109	0.106	0.094	0.095

4.4.3.3. The moderating effects of regional-level litigation risk

In addition, we examine the moderating effects of regional litigation risk on the association between CEOs' early-life experience and crash risk. Firms located in regions with better legal development tend to face higher litigation risk (Fan et al., 2013; Cai et al., 2020). Following previous literature (Fan et al., 2013; Jiang et al., 2020; Hu and Fang, 2022), we use the province-level legal development index (*Legal environment*) developed by the National Economic Research Institute (NERI) to measure the development of provincial legal environment. Firms in the Weak-*Legal environment* and Strong-*Legal environment* groups are headquartered in provinces with below-median *Legal environment* and above-median *Legal environment* in each year, respectively. It is expected that firms located in regions with strong legal environments are more likely to have higher litigation risk. Thus, CEOs with early-life experience may be more risk-averse and less likely to withhold bad news in strong legal environments to mitigate potential litigation risk and cost.

We re-run our baseline regression using subsamples based on *Legal environment* in Table 4.5. As shown in Columns (1) and (2), the negative associations between *CR* and crash risk measures ($Ncskew_{t+1}$ and $Duvol_{t+1}$) are both statistically significant at the 5% level for Strong-

Legal environment subsamples. However, the negative associations become insignificant for Weak-*Legal environment* subsamples. These results suggest that CEOs who experienced the Cultural Revolution in their early life tend to be more risk-averse and less likely to withhold bad news to reduce firms' potential litigation risk, thus decreasing future crash risk.

Table 4.5. The moderating effects of local legal environment

This table shows the regression results of subsample analyses based on provincial-level litigation risk. We use the province-level legal development index (*Legal environment*) developed by NERI to measure local litigation risk. *CR*, *Crashrisk* ($Nckew_{t+1}$ and $Duvol_{t+1}$) and Controls are the same as in Table 4.2. Appendix A presents the detailed variable definitions. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Strong-*legal environment* (High-litigation risk)	Strong-*legal environment* (High-litigation risk)	Weak-*legal environment* (Low-litigation risk)	Weak-*legal environment* (Low-litigation risk)
	(1)	(2)	(3)	(4)
	$Ncskew_{t+1}$	$Duvol_{t+1}$	$Ncskew_{t+1}$	$Duvol_{t+1}$
CR_t	-0.048**	-0.030**	-0.011	0.001
	(-2.226)	(-2.090)	(-0.388)	(0.079)
$Ncskew_t$	-0.081***		-0.122***	
	(-8.821)		(-12.521)	
$Duvol_t$		-0.087***		-0.128***
		(-9.531)		(-13.314)
Ret_t	2.923***	2.600***	8.864***	5.157***
	(2.779)	(3.632)	(7.819)	(6.827)
$Sigma_t$	-0.291	-0.594*	-0.065	-0.238
	(-0.596)	(-1.797)	(-0.130)	(-0.723)
$Dturn_t$	-0.009	0.011	-0.050***	-0.040***
	(-0.458)	(0.834)	(-2.809)	(-3.429)
$Size_t$	0.087***	0.042***	0.049**	0.012
	(5.520)	(3.932)	(2.365)	(0.838)
Lev_t	-0.050	-0.028	-0.066	-0.006
	(-0.770)	(-0.628)	(-0.840)	(-0.109)
ROA_t	0.261	0.139	0.064	0.075
	(1.580)	(1.242)	(0.385)	(0.686)
$Growth_t$	-0.007	-0.004	-0.031*	-0.029**
	(-0.513)	(-0.422)	(-1.826)	(-2.563)
$Big4/10_t$	-0.039**	-0.020*	-0.012	0.010
	(-2.170)	(-1.658)	(-0.594)	(0.727)
$Board\ size_t$	-0.091	-0.014	-0.040	-0.023
	(-1.605)	(-0.375)	(-0.537)	(-0.462)
$Independence_t$	-0.038	0.110	0.002	0.082
	(-0.212)	(0.903)	(0.010)	(0.524)
$Top1_t$	-0.393***	-0.249***	-0.264**	-0.189**
	(-4.438)	(-4.150)	(-2.121)	(-2.286)
BM_t	-0.078***	-0.044***	-0.047***	-0.024**

	(-6.593)	(-5.505)	(-3.321)	(-2.496)
$Firmage_t$	-0.213**	-0.093	-0.403***	-0.362***
	(-2.556)	(-1.645)	(-3.345)	(-4.525)
SOE_t	-0.040	-0.037	-0.025	-0.034
	(-1.170)	(-1.590)	(-0.477)	(-0.984)
$absACC_t$	0.030	0.023	0.115	0.052
	(0.379)	(0.429)	(1.253)	(0.863)
$CEO\ age_t$	0.110	0.073	0.050	0.008
	(1.419)	(1.382)	(0.539)	(0.124)
$CEO\ gender_t$	-0.077**	-0.041	0.017	-0.018
	(-1.985)	(-1.551)	(0.393)	(-0.623)
$CEO\ duality_t$	-0.002	-0.001	0.028	0.019
	(-0.084)	(-0.066)	(1.170)	(1.210)
Constant	-1.275***	-0.734**	-0.191	0.606
	(-2.786)	(-2.363)	(-0.323)	(1.538)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	14,642	14,642	14,473	14,473
Adjusted R^2	0.108	0.106	0.102	0.103

4.4.4. Endogeneity

Our baseline results may be subject to endogeneity. For example, CEOs who experienced the Cultural Revolution are likely to choose firms with conservative behaviours. It is also possible that firms may intentionally hire CEOs who are more risk-averse in financial reporting and disclosure practices. In this section, we address the potential endogeneity issue in several ways, including adopting the multiple fixed effects model, PSM analysis, DiD analysis, and placebo tests.

4.4.4.1. Controlling for multiple fixed effects

We re-estimate our baseline model (Equation (4.4)) using industry and year fixed effects with standard errors clustered at the firm level in Columns (1) and (2), firm fixed effects and industry×year fixed effects in Columns (3) and (4), as well as firm fixed effects and province×year fixed effects in Columns (5) and (6). Table 4.6 reports the regression results after including multiple fixed effects. The coefficients on *CR* in Table 4.6 are all negative and

significant at least at the 10% level after controlling for the multiple fixed effects. These results indicate that our results are robust when controlling for the multiple fixed effects.

Table 4.6. Endogeneity: Controlling for multiple fixed effects

This table reports the regression results after controlling for multiple fixed effects. Control variables are the same as in Table 4.2. Appendix A presents the detailed variable definitions. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	$Ncskew_{t+1}$	$Duvol_{t+1}$	$Ncskew_{t+1}$	$Duvol_{t+1}$	$Ncskew_{t+1}$	$Duvol_{t+1}$
CR_t	-0.028**	-0.016**	-0.033**	-0.016*	-0.037**	-0.018*
	(-2.435)	(-1.989)	(-2.130)	(-1.705)	(-2.340)	(-1.709)
$Ncskew_t$	0.056***		-0.062***		-0.060***	
	(9.067)		(-9.512)		(-9.241)	
$Duvol_t$		0.046***		-0.066***		-0.066***
		(7.512)		(-10.213)		(-10.275)
Ret_t	9.187***	5.915***	7.198***	4.698***	6.951***	4.606***
	(13.626)	(12.835)	(9.392)	(8.894)	(9.115)	(8.984)
$Sigma_t$	-0.879***	-0.928***	-0.460	-0.701***	-0.376	-0.591***
	(-3.017)	(-4.769)	(-1.371)	(-3.156)	(-1.115)	(-2.633)
$Dturn_t$	-0.036***	-0.019**	-0.023*	-0.005	-0.027**	-0.013
	(-3.143)	(-2.415)	(-1.859)	(-0.479)	(-2.142)	(-1.540)
$Size_t$	0.003	-0.014***	0.075***	0.014**	0.051***	0.016**
	(0.625)	(-3.662)	(6.761)	(2.068)	(4.570)	(2.181)
Lev_t	0.005	-0.001	-0.024	0.026	-0.075	-0.037
	(0.163)	(-0.047)	(-0.536)	(0.932)	(-1.637)	(-1.200)
ROA_t	0.340***	0.231***	0.234**	0.183	0.202*	0.135*
	(3.595)	(3.653)	(2.095)	(1.642)	(1.795)	(1.798)
$Growth_t$	-0.007	-0.007	-0.021**	-0.024**	-0.017	-0.014*
	(-0.644)	(-0.964)	(-1.964)	(-2.046)	(-1.555)	(-1.891)
$Big4/10_t$	-0.014	-0.007	-0.025**	-0.003	-0.021	-0.002
	(-1.588)	(-1.137)	(-2.003)	(-0.477)	(-1.615)	(-0.255)
$Board\ size_t$	-0.041	-0.021	-0.069*	-0.003	-0.051	-0.004
	(-1.638)	(-1.245)	(-1.665)	(-0.084)	(-1.220)	(-0.161)
$Independence_t$	-0.071	-0.037	0.003	0.113	0.010	0.082
	(-0.748)	(-0.609)	(0.026)	(1.081)	(0.077)	(0.916)
$Top1_t$	-0.136***	-0.078***	-0.282***	-0.142***	-0.290***	-0.171***
	(-3.995)	(-3.365)	(-4.180)	(-3.462)	(-4.459)	(-3.920)
BM_t	-0.036***	-0.015***	-0.066***	-0.041***	-0.036***	-0.017***
	(-5.247)	(-3.380)	(-7.641)	(-5.001)	(-4.327)	(-2.982)
$Firmage_t$	-0.048***	-0.038***	-0.159***	-0.042	-0.200***	-0.144***
	(-3.402)	(-4.072)	(-2.808)	(-1.157)	(-3.437)	(-3.689)
SOE_t	-0.054***	-0.037***	-0.055**	-0.040***	-0.057**	-0.047***
	(-5.178)	(-5.357)	(-2.110)	(-2.638)	(-2.157)	(-2.681)
$absACC_t$	0.104*	0.055	0.146**	0.059	0.075	0.033
	(1.954)	(1.547)	(2.441)	(1.241)	(1.290)	(0.831)
$CEO\ age_t$	0.041	0.030	0.100*	0.050	0.099*	0.045
	(0.997)	(1.092)	(1.849)	(1.365)	(1.814)	(1.225)
$CEO\ gender_t$	-0.026	-0.018	-0.027	-0.014	-0.015	-0.013
	(-1.496)	(-1.585)	(-1.036)	(-0.905)	(-0.593)	(-0.746)
$CEO\ duality_t$	0.037***	0.017**	0.020	0.009	0.018	0.009
	(3.467)	(2.467)	(1.300)	(0.967)	(1.160)	(0.879)
Constant	0.159	0.464***	-1.040***	-0.101	-0.728**	-0.041

	(0.827)	(3.612)	(-2.922)	(-0.424)	(-2.097)	(-0.175)
Firm FE	No	No	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	No	No	No	No
Industry FE	Yes	Yes	No	No	No	No
Industry*Year FE	No	No	Yes	Yes	No	No
Province*Year FE	No	No	No	No	Yes	Yes
Observations	29,115	29,115	29,115	29,115	29,115	29,115
Adjusted R^2	0.065	0.069	0.106	0.107	0.096	0.097

4.4.4.2. PSM analysis

Following Hu et al. (2020) and Long et al. (2020), we further employ the PSM analysis to address the concern that the baseline results are subject to sample selection bias. We first estimate a probit model to predict the likelihood that firms hire a CEO with early-life Cultural Revolution experience by including the control variables such as firm-specific variables[51] in Table 4.2. The aim of the PSM is to produce two statistically similar samples with and without CEOs who experienced the Cultural Revolution, respectively. Then, we estimate the propensity score and perform a one-to-one PSM procedure. For each firm led by a CEO with early-life experience, we select one control firm with the closest propensity score and a CEO without early-life experience, constituting the matched control group[52]. Finally, we re-estimate Equation (4.4) using the PSM matched sample.

Column (1) in Panel A of Table 4.7 reports the results from a probit model with a binary *CR* dummy using the full sample. Firms with a larger size, with a lower growth rate, and SOEs are more likely to hire CEOs with early-life experiences. Columns (2) and (3) of Panel A present the regression results of the PSM sample. The coefficients on *CR* remain negative and significant at the 5% level. Panel B of Table 4.7 reports the results of covariate balance checks on the mean difference of the covariates in the propensity-matched sample. The differences in

[51] We exclude *Ncskew*, *Duvol*, *Ret*, *Sigma*, and *Dturn* which are less likely to impact the likelihood of CEO's early-life experience.
[52] We match using the nearest neighbor within a 0.01 caliper (distance).

means between the covariates of the treatment and control groups are insignificant, suggesting that our PSM procedure is successful.

Overall, the results in Table 4.7 suggest that the documented negative association between CEOs with early-life Cultural Revolution experience and crash risk is robust after mitigating the sample selection concern.

Table 4.7. Endogeneity: PSM analysis

Panel A reports the regression results using a PSM procedure. Column (1) reports the results from a probit model with a binary *CR* dummy using the full sample including industry and year fixed effects with standard errors clustered at firm level. Columns (2) and (3) present the regression results using the propensity-matched sample. Panel B reports the results of covariate balance checks on the mean difference of the covariates in the propensity-matched sample. Variable definitions are provided in Appendix A. All the continuous variables are winsorized at the 1% and 99% levels. The regressions control for the firm and year fixed effects. The t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: The regression results using PSM procedure

	(1)	(2)	(3)
	CR	$Ncskew_{t+1}$	$Duvol_{t+1}$
CR_t		-0.050**	-0.028**
		(-2.413)	(-2.063)
$Ncskew_t$		-0.069***	
		(-8.324)	
$Duvol_t$			-0.069***
			(-8.402)
Ret_t		6.054***	4.282***
		(6.337)	(6.787)
$Sigma_t$		-0.428	-0.672**
		(-0.982)	(-2.352)
$Dturn_t$		-0.028*	-0.017*
		(-1.750)	(-1.658)
$Size_t$	0.073**	0.089***	0.044***
	(2.070)	(6.254)	(4.697)
Lev_t	-0.116	-0.088	-0.061
	(-0.664)	(-1.451)	(-1.534)
ROA_t	-0.149	0.425***	0.261**
	(-0.309)	(2.679)	(2.491)
$Growth_t$	-0.095***	-0.007	-0.011
	(-2.739)	(-0.510)	(-1.179)
$Big4/10_t$	0.025	-0.031*	-0.013
	(0.447)	(-1.852)	(-1.119)
$Board\ size_t$	0.254	-0.094*	-0.048
	(1.489)	(-1.673)	(-1.308)
$Independence_t$	0.578	0.028	0.072
	(1.036)	(0.168)	(0.661)

$Top1_t$	0.304	-0.188**	-0.115**
	(1.327)	(-2.266)	(-2.108)
BM_t	-0.007	-0.049***	-0.025***
	(-0.237)	(-5.524)	(-4.319)
$Firmage_t$	0.166	-0.098	-0.087*
	(1.601)	(-1.345)	(-1.811)
SOE_t	0.252***	-0.001	-0.040*
	(3.389)	(-0.030)	(-1.677)
$absACC_t$	-0.376*	0.121	0.027
	(-1.807)	(1.557)	(0.522)
CEO age$_t$		0.123*	0.068
		(1.655)	(1.397)
CEO gender$_t$		-0.057	-0.038
		(-1.610)	(-1.626)
CEO duality$_t$		0.055**	0.025*
		(2.502)	(1.702)
Constant	-2.140***	-1.590***	-0.625**
	(-2.616)	(-3.754)	(-2.239)
Year FE	Yes	Yes	Yes
Industry FE	Yes	No	No
Firm FE	No	Yes	Yes
Observations	29,095	18,374	18,374
Pseudo R^2	0.106		
Adjusted R^2		0.100	0.102

Panel B: The results of covariate balance checks

	Firms with *CR*	Firms without *CR*	Diff. in means (t-stat)	Standardized Bias (%)
Firm size	22.020	22.005	0.015	1.1
			(0.76)	
Leverage	0.457	0.458	–0.001	-0.3
			(–0.18)	
ROA	0.038	0.037	0.001	0.3
			(0.25)	
Sales growth	0.182	0.181	0.001	0.1
			(0.10)	
Big 4/10	0.440	0.439	0.001	0.1
			(0.06)	
Board size	2.169	2.173	-0.004	-2.3
			(-1.62)	
Independence	0.367	0.366	0.001	1.5
			(1.06)	
Top1	0.359	0.361	–0.002	-1.4
			(–0.93)	
BM	1.106	1.111	–0.004	-0.4
			(–0.27)	
Firm age	2.739	2.732	0.007	1.8

			(1.24)	
SOE	0.499	0.503	-0.004	-0.9
			(-0.59)	
absACC	0.077	0.076	0.001	1.0
			(0.68)	

4.4.4.3. DiD analysis

We employ a DiD analysis based on CEO turnover to further address the endogeneity issues. Following prior studies (Li et al., 2017; Hu et al., 2020; Yao et al., 2020), we identify the treatment group as firms with the transition from a CEO without early-life Cultural Revolution experience to a CEO with early-life Cultural Revolution experience. Meanwhile, the control group consists of firms transitioning from a CEO with early-life Cultural Revolution experience to a CEO without early-life Cultural Revolution experience. We then build our DID sample including observations 2-year before and 2-year after a CEO transition, excluding the transition year t. Our DID model is as follow:

$$CrashRrisk_{i,t+1} = \beta_0 + \beta_1 Transition * Post_{i,t} + \beta_2 Transition_{i,t} + \beta_3 Post_{i,t} + \sum_k \beta_k Controls_{k,i,t} + Firm + Year + \epsilon_{i,t+1} \quad (4.5)$$

where the dependent variable $CrashRisk_{i,t+1}$ represents our two measures for stock price crash risk ($Nckew_{t+1}$ and $Duvol_{t+1}$). $Transition_{i,t}$ is a dummy variable that equals one if firm i's transition year t is a CEO without early-life experience to a CEO with early-life experience transition and zero if firm i's transition year t does not involve any a CEO with Cultural Revolution experience. $Post_{i,t}$ is a dummy variable which equals one if firm-year observations are after the CEO transition, and zero otherwise.

$Transition*Post_{i,t}$ is an interaction term and its coefficients are expected to be negative if our H1 holds, i.e., CEOs who experienced the early-life Cultural Revolution reduce the likelihood of future crash risk. Table 4.8 presents the regression results of Equation (4.5). The

coefficients on $Transition*Post_{i,t}$ are both negative and statistically significant at least at the 10% level. These results indicate that newly appointed CEOs with early-life experience significantly reduce stock price crash risk than newly appointed CEOs without early-life experience.

Table 4.8. Endogeneity: DiD analysis

This table reports the coefficients of the following regression:

$$CrashRrisk_{i,t+1} = \beta_0 + \beta_1 Transition * Post_{i,t} + \beta_2 Transition_{i,t} + \beta_3 Post_{i,t} + \sum_k \beta_k Controls_{k,i,t} + Firm + Year + \epsilon_{i,t+1}$$

where the dependent variable $CrashRisk_{i,t+1}$ represents our measures for future stock price crash risk. $Transition_{i,t}$ is a dummy variable that equals one if firm i's transition year t is a CEO without early-life Cultural Revolution experience to a CEO with early-life Cultural Revolution experience transition and zero if firm i's transition year t does not involve any a CEO with early-life Cultural Revolution experience. $Post_{i,t}$ is a dummy variable which equals one if firm-year observations are after the CEO transition and zero otherwise. Variable definitions are provided in Appendix A. All the continuous variables are winsorized at the 1% and 99% levels. The regressions control for the firm and year fixed effects. The t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
	$Ncskew_{t+1}$	$Duvol_{t+1}$
$Transition_t*Post_t$	-0.124**	-0.063*
	(-1.989)	(-1.768)
$Transition_t$	0.043	0.037
	(0.657)	(0.999)
$Post_t$	0.097**	0.038
	(2.279)	(1.539)
$Ncskew_t$	-0.122***	
	(-5.238)	
$Duvol_t$		-0.140***
		(-6.119)
Ret_t	4.041*	4.096**
	(1.716)	(2.434)
$Sigma_t$	0.342	0.100
	(0.312)	(0.136)
$Dturn_t$	-0.032	-0.073
	(-0.544)	(-1.508)
$Size_t$	0.130***	0.082***
	(3.043)	(3.037)
Lev_t	-0.241	0.005
	(-1.547)	(0.054)
ROA_t	0.862	0.864*
	(1.315)	(1.851)

Growth$_t$	0.058	-0.031
	(0.948)	(-0.609)
Big4/10$_t$	0.062*	0.025
	(1.805)	(1.275)
Board size$_t$	0.209	0.340
	(1.116)	(1.474)
Independence$_t$	0.542	0.486
	(0.962)	(1.400)
Top1$_t$	-0.127	-0.177
	(-0.490)	(-1.055)
BM$_t$	-0.080*	-0.095***
	(-1.803)	(-2.880)
Firmage$_t$	0.137	0.034
	(0.590)	(0.298)
SOE$_t$	0.056	-0.010
	(0.596)	(-0.188)
absACC$_t$	-0.164	0.036
	(-0.725)	(0.202)
CEO age$_t$	0.432***	0.236*
	(2.598)	(1.922)
CEO gender$_t$	0.005	0.018
	(0.082)	(0.488)
CEO duality$_t$	0.007	-0.008
	(0.180)	(-0.337)
Constant	-5.724***	-3.873***
	(-4.337)	(-3.857)
Firm FE	Yes	Yes
Year FE	Yes	Yes
Observations	2,672	2,672
Adjusted R^2	0.124	0.139

4.4.4.4. Placebo tests

It is possible that the negative and significant effect of CEO's early-life is driven by spurious correlations in our data. For example, the documented results may also reflect the effect of other experiences of the CEO born between 1948 and 1963. To control for the impact of endogeneity issues, we conduct a series of placebo tests to further validate the baseline results following Chen et al. (2021). First, we contrast a *pseudo-CR* variable based on the randomly assigned *CR* to measure CEO early-life Cultural Revolution experience. We employ

pseudo-*CR* variable rather than true *CR* variable to estimate the baseline model. Then, we repeat this procedure for 500 times, thereby generating 500 coefficient estimates of the pseudo-*CR* variable for the crash risk measures employed in this analysis. Using these estimates, we finally construct an empirical distribution of the *CR* coefficient under the scenario that the relation between CEO's early-life Cultural Revolution experience and crash risk is of a spurious nature.

The results of this analysis are reported in Table 4.9. To facilitate comparison, we also report the actual *CR* coefficient estimates (from the baseline regressions). The table shows that actual *CR* coefficient estimates lie at the extreme lower tail of the empirical distributions of pseudo-*CR* coefficients, indicating that the baseline results are unlikely to be driven by spurious correlations.

Table 4.9. Placebo tests

This table presents the results of placebo tests. *CR* is a dummy variable that equals 1 if the CEO experienced the Cultural Revolution between the age of 13 and 18, and 0 otherwise. *Ncskew and Duvol* are the measures of stock price crash risk. We contrast a pseudo-*CR* variable based on the randomly assigned *CR* to measure CEOs' early-life Cultural Revolution experience. The procedure is repeated for 500 times, thereby generating 500 coefficient estimates of the pseudo-*CR* variable. For comparison, we also report the actual estimates of *CR* coefficient, replicated from Table 4.2.

	(1)	(2)
	$Ncskew_{t+1}$	$Duvol_{t+1}$
Mean β for pseudo-*CR*	0.000	0.000
Max β for pseudo-*CR*	0.033	0.019
99% percentile β for pseudo-*CR*	0.019	0.014
95% percentile β for pseudo-*CR*	0.013	0.009
75% percentile β for pseudo-*CR*	0.006	0.004
Median β for pseudo-*CR*	0.000	0.000
25% percentile β for pseudo-*CR*	-0.006	-0.004
5% percentile β for pseudo-*CR*	-0.014	-0.008
1% percentile β for pseudo-*CR*	-0.019	-0.012
Min β for pseudo-*CR*	-0.026	-0.019
Coefficient of **actual *CR*** in Table 4.2	**-0.044**	**-0.022**

4.4.5. Robustness check

4.4.5.1 Controlling for the Cultural Revolution intensity of CEO's birthplace

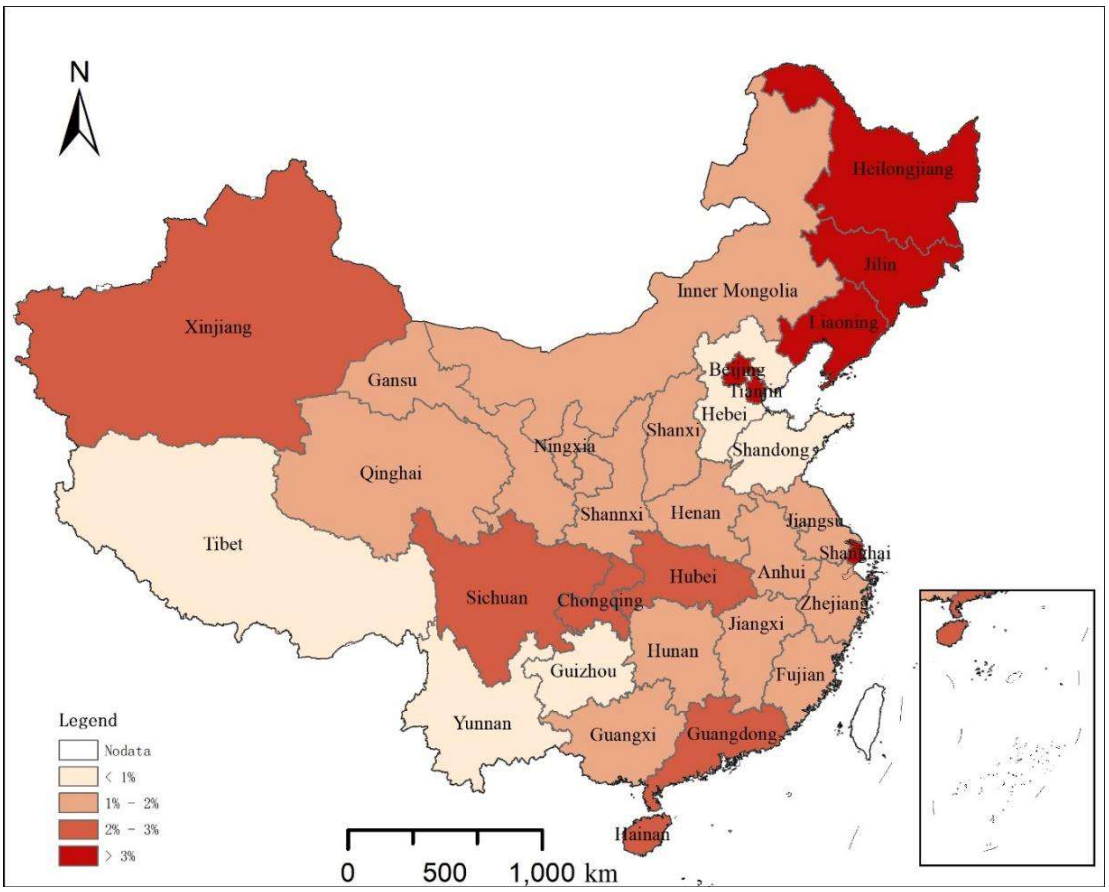
While the Cultural Revolution affected the whole country, its severity varied across provinces. Under this circumstance, the severity of the Cultural Revolution determines how deeply the experience of the Cultural Revolution is imprinted on CEOs. Thus, we first collect the birthplace information of the CEOs. The CEOs' birthplace information is obtained from CSMAR database, and we manually collected the missing birthplace information through Google and Baidu browsers if it is not available in the CSMAR database. Then, we construct the *Intensity*[53] variable, which indicates the severity of the Cultural Revolution in CEOs' birth provinces to measure the intensity of the Cultural Revolution influence. *Intensity* is calculated as the proportion of the population in each province that is involved in the "send-down" movement[54] during the Cultural Revolution period. The "send-down" movement resulted in one out of every three urban adolescents approximately 17 million[55] youths were sent to the countryside for manual labor for from one to as many as ten years during the period 1966–1976 (Li et al., 2010). Also, it has been found that the send-down experience largely impacted these youths' long-term characteristics such as financial behaviour (Fan, 2017), political attitudes (Harmel and Yeh, 2016), and beliefs and values (Gong et al., 2015). Hence, the larger the proportion of the "move-down" youths, the higher the severity of the Cultural Revolution influence. Figure 1 reports the intensity of the Cultural Revolution across provinces in China[56].

[53] The Revolution intensity used to measure *Intensity* is shown in Appendix B.
[54] The send-down movement is also known as "going up to the mountains and down to the villages" (shangshan xiaxiang), or the "rustication movement."
[55] The detailed population that was involved in "Send-down" movement in each province during the Cultural Revolution are reported in Appendix B.
[56] The classification criteria are used to show the figure only. We use provincial-level Cultural Revolution intensity itself in the regressions, e.g., Equation 4.6.

The deeper the colour, the greater the Revolution influence. We can see the variability of the intensity across regions, with the strongest Revolution intensity being in Shanghai, Beijing, and Tianjin.

Figure 1. Cultural Revolution intensity across China

Fig. 1 reports the intensity of the influence of China's Cultural Revolution across provinces. The deeper the colour, the greater the Revolution influence.



We construct Equation (4.6) to examine the impact of CEOs' early-life Cultural Revolution experience on crash risk considering the intensity of the Cultural Revolution:

$$CrashRisk_{i,t+1} = \beta_0 + \beta_1 CR_{i,t} * Intensity_{i,t} + \beta_2 CR_{i,t} + \beta_3 Intensity_{i,t} + \sum_k \beta_k Controls_{k,i,t} + Firm + Year + \epsilon_{i,t+1} \quad (4.6)$$

where all variables are the same as those in Equation (4.4) except $CR_{i,t} * Intensity_{i,t}$ that is the interaction term between $CR_{i,t}$ and $Intensity_{i,t}$, and $Intensity_{i,t}$ refers to the severity of Cultural Revolution in CEO's birth province. We expect to find that the interaction term

(*CR*Intensity*) between the CEOs' early-life Cultural Revolution experience measure (*CR*) and the intensity of Cultural Revolution in CEOs' birth province (*Intensity*) has a significantly negative influence on crash risk. We report the regression results in Table 4.10. As shown in Columns (1) and (2), the coefficients on *CR*Intensity* are both negative and significant at least at the 5% level after controlling for firm and year fixed effect. We further control for CEO birthplace effects and the results are reported in Columns (3) and (4). The coefficients on *CR*Intensity* are also negative and statistically significant at least at the 5% level, indicating a more significantly reduce of the level of crash risk of firms having CEOs with higher intensity of early-life Cultural Revolution experience.

Table 4.10. Robustness check: Controlling for the intensity of the Cultural Revolution

This table reports the impact of CEOs' early-life Cultural Revolution experience on stock price crash risk in and in Chinese listed firms considering of the CEOs' birthplace severity of the Cultural Revolution. Specially, Columns (1) and (2) report the coefficients of the following regression with firm and year fixed effects. Columns (3) and (4) report the coefficients of the following regression after controlling for firm, year, and CEOs' birthplace fixed effects:

$$CrashRisk_{i,t+1} = \beta_0 + \beta_1 CR_{i,t} * Intensity_{i,t} + \beta_2 CR_{i,t} + \beta_3 Intensity_{i,t} + \sum_k \beta_k Controls_{k,i,t} + Firm + Year + \epsilon_{i,t+1}$$

where $CR_{i,t} * Intensity_{i,t}$ is the interaction term between $CR_{i,t}$ and $Intensity_{i,t}$. $CR_{i,t}$ is a dummy variable that equals 1 if the CEO experienced China's Cultural Revolution between the age of 13 and 18, and 0 otherwise. $Intensity_i$ refers to the severity of Cultural Revolution in CEOs' birth provinces. $Controls_{k,i,t}$ refers to a set of control variables. All continuous variables are winsorized at the 1% level in each tail. The detailed definitions of all variables are shown in Appendix A. The t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
	$Ncskew_{t+1}$	$Duvol_{t+1}$	$Ncskew_{t+1}$	$Duvol_{t+1}$
CR_t*$Intensity_t$	-0.028**	-0.023***	-0.026**	-0.021***
	(-2.421)	(-2.907)	(-2.203)	(-2.606)
CR_t	0.032	0.069**	0.038	0.070**
	(0.641)	(2.038)	(0.747)	(2.009)
$Intensity_t$	0.022**	0.019***	-6.379	-3.828
	(2.263)	(2.914)	(-1.296)	(-1.153)
$Ncskew_t$	-0.104***		-0.105***	

	(-9.880)		(-10.003)	
$Duvol_t$		-0.114***		-0.115***
		(-10.984)		(-11.099)
Ret_t	7.423***	5.007***	7.502***	5.044***
	(6.398)	(6.386)	(6.460)	(6.427)
$Sigma_t$	0.389	-0.168	0.356	-0.182
	(0.720)	(-0.465)	(0.658)	(-0.503)
$Dturn_t$	-0.033*	-0.027**	-0.032*	-0.026**
	(-1.922)	(-2.296)	(-1.861)	(-2.255)
$Size_t$	0.084***	0.038***	0.079***	0.036**
	(4.034)	(2.691)	(3.782)	(2.528)
Lev_t	-0.111	-0.045	-0.107	-0.041
	(-1.321)	(-0.803)	(-1.269)	(-0.730)
ROA_t	0.277	0.212	0.271	0.212
	(1.420)	(1.606)	(1.385)	(1.607)
$Growth_t$	-0.037*	-0.027*	-0.038*	-0.028**
	(-1.769)	(-1.941)	(-1.830)	(-1.993)
$Big4/10_t$	-0.017	0.005	-0.021	0.002
	(-0.789)	(0.348)	(-0.976)	(0.172)
$Board\ size_t$	0.048	0.030	0.040	0.019
	(0.641)	(0.585)	(0.534)	(0.375)
$Independence_t$	0.076	0.129	0.045	0.108
	(0.323)	(0.816)	(0.192)	(0.682)
$Top1_t$	-0.327**	-0.221**	-0.303**	-0.203**
	(-2.547)	(-2.554)	(-2.345)	(-2.321)
BM_t	-0.063***	-0.030***	-0.063***	-0.031***
	(-4.135)	(-2.972)	(-4.122)	(-3.028)
$Firmage_t$	-0.164	-0.084	-0.186*	-0.089
	(-1.626)	(-1.231)	(-1.829)	(-1.293)
SOE_t	-0.141**	-0.087**	-0.125**	-0.079**
	(-2.475)	(-2.267)	(-2.188)	(-2.046)
$absACC_t$	0.074	0.089	0.083	0.093
	(0.779)	(1.401)	(0.879)	(1.447)
$CEO\ age_t$	-0.113	-0.184**	-0.135	-0.185**
	(-0.835)	(-2.010)	(-0.971)	(-1.975)
$CEO\ gender_t$	-0.032	-0.030	-0.010	-0.021
	(-0.472)	(-0.661)	(-0.144)	(-0.443)
$CEO\ duality_t$	0.028	0.026	0.025	0.026
	(0.922)	(1.274)	(0.817)	(1.271)
Constant	-0.745	0.226	9.716	6.472
	(-1.081)	(0.486)	(1.236)	(1.221)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Birthplace	No	No	Yes	Yes
Observations	11,962	11,962	11,962	11,962
Adjusted R^2	0.100	0.102	0.101	0.103

4.4.5.2. Alternative measure of CEO's early-life experience

We then construct an alternative measure of CEOs' early-life experience to further examine the robustness of our baseline results. *CR-years* is the natural logarithm of one plus the number of years that a CEO experienced China's Cultural Revolution (1966-1976) during the age of 13 and 18. We expect that the more years a CEO experienced the Cultural Revolution during the adolescence period, the more he will be affected by the Cultural Revolution influences. Thus, CEOs exposed to the Cultural Revolution for a longer time in adolescence can be more risk-averse and less likely to hoard bad news.

Table 4.11 presents the regression results of employing alternative measure of CEOs early-life Cultural Revolution experience. The coefficients on *CR-years* are all negative and significant at the 5% level, indicating that the more years the Cultural Revolution during their adolescence period, the more pronounced the negative impact on stock price crash risk.

Table 4.11. Robustness check: Alternative measure of CEOs' early-life experience

CR-years is the natural logarithm of one plus the number of years that a CEO experienced China's Cultural Revolution (1966-1976) during the age of 13 and 18. *Controls* are the same as in Table 4.2. Appendix A presents the detailed variable definitions. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
	$Ncskew_{t+1}$	$Duvol_{t+1}$
CR-years	-0.028**	-0.016**
	(-2.498)	(-2.131)
$Ncskew_t$	-0.060***	
	(-8.687)	
$Duvol_t$		-0.066***
		(-9.971)
Ret_t	7.631***	4.940***
	(9.677)	(9.575)
$Sigma_t$	-0.485	-0.636***
	(-1.379)	(-2.784)
$Dturn_t$	-0.033**	-0.019**
	(-2.507)	(-2.191)
$Size_t$	0.068***	0.025***
	(5.893)	(3.371)
Lev_t	-0.080*	-0.034
	(-1.685)	(-1.114)
ROA_t	0.239**	0.160**

	(2.038)	(2.085)
$Growth_t$	-0.014	-0.014*
	(-1.236)	(-1.817)
$Big4/10_t$	-0.028**	-0.007
	(-2.108)	(-0.789)
$Board\ size_t$	-0.050	-0.007
	(-1.145)	(-0.243)
$Independence_t$	-0.008	0.081
	(-0.057)	(0.887)
$Top1_t$	-0.285***	-0.191***
	(-4.012)	(-4.132)
BM_t	-0.054***	-0.026***
	(-6.268)	(-4.707)
$Firmage_t$	-0.185***	-0.131***
	(-3.184)	(-3.471)
SOE_t	-0.057**	-0.050***
	(-2.071)	(-2.805)
$absACC_t$	0.097	0.053
	(1.579)	(1.330)
$CEO\ age_t$	0.121**	0.060
	(2.037)	(1.560)
$CEO\ duality_t$	0.024	0.012
	(1.437)	(1.073)
Constant	-1.166***	-0.331
	(-3.453)	(-1.501)
Firm FE	Yes	Yes
Year FE	Yes	Yes
Observations	29,115	29,115
Adjusted R^2	0.088	0.090

4.4.6. Channel analysis

In this sub-section, we analyse the channels through which CEOs with early-life experience reduce stock price crash risk. As documented before, the risk perception of the CEO potentially links the Cultural Revolution experience and crash risk. CEOs with early-life experience are more risk-averse, thereby may leading to less risk-taking accounting practices. We expect that CEOs' early-life experience will reduce earnings management and tax avoidance, which in turn lead to lower crash risk.

4.4.6.1. Reducing accrual-based earnings management

Prior literature documents that financial opacity (such as earnings management) facilitates bad news hoarding and increases crash risk (Jin and Myers, 2006; Hutton et al., 2009; Kim and

Zhang, 2014). For example, Hutton et al. (2009) find that firms that engage in earnings management (proxied by accumulated accruals) are prone to stock price crashes. Kim and Zhang (2014) document that accrual management is positively and significantly associated with crash risk. Thus, reducing accrual-based earnings management is an important mechanism for firms to stabilize stock market and reduce stock price crash risk. We expect that CEOs with the early-life Cultural Revolution experience are less likely to engage in accrual-based earnings management, thereby reducing crash risk.

We examine whether CEOs with early-life experience can reduce stock price crash risk through reducing accrual-based earnings management in Table 4.12. In the first-stage analysis, we examine whether CEOs with early-life Revolution experience decrease accrual-based earnings management. Following previous studies (Xu et al., 2014; Ji et al., 2021; Xiao et al., 2022), we employ *absACC,* which is the absolute value of the estimated residuals from the adjusted-Jones model (Dechow et al. 1995) to measure accrual-based earnings management. The greater the *absACC* is, the higher the level of accrual-based earnings management. As shown in the first stage of Table 4.12, the coefficient on *CR* is negative and statistically significant at the 5% level, which suggests that CEOs who experienced Cultural Revolution in early life are less likely to engage in accrual-based earnings management. In the second-stage estimation, the fitted values generated from the first-stage estimation are used as the main independent variable, which captures the level of accrual-based earnings management that can be explained by CEOs with early-life Cultural Revolution experience. As shown in Columns (1) and (2), the coefficients on *Predicted-absACC* are all positive and significant at the 1% significance level, indicating that accrual-based earnings management leads to higher crash risk. Overall, Table 4.12 suggests that CEOs with early-life experience are less likely to engage in accrual-based earnings management, thus leading to lower crash risk.

Table 4.12. Channel test: Decreasing accrual-based earning management

This table presents the impact of CEOs with early-life experience on stock price crash risk via reducing accrual-based earnings management. The first stage reports the results of the impact of CEOs' early-life Cultural Revolution experience (*CR*) on accrual-based earnings management (*absACC*). The second stage presents the results of the impact of the predicted value of accrual-based earnings management (*Predicted-absACC*) on stock price crash risk ($Ncskew_{t+1}$ and $Duvol_{t+1}$). Control variables are the same as in Table 4.2. All continuous variables are winsorized at the 1% level in each tail. Appendix A presents the detailed variable definitions. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

First stage		Second stage		
	absACC		$Ncskew_{t+1}$	$Duvol_{t+1}$
			(1)	(2)
CR_t	-0.003**	*Predicted-absACC*	13.081***	6.468**
	(-2.034)		(2.844)	(2.097)
$Ncskew_t$		$Ncskew_t$	-0.059***	
			(-9.166)	
$Duvol_t$		$Duvol_t$		-0.066***
				(-10.337)
Ret_t		Ret_t	6.577***	4.343***
			(8.777)	(8.616)
$Sigma_t$		$Sigma_t$	-0.274	-0.549**
			(-0.826)	(-2.479)
$Dturn_t$		$Dturn_t$	-0.030**	-0.015*
			(-2.386)	(-1.827)
$Size_t$	-0.003**	$Size_t$	0.086***	0.034***
	(-2.377)		(5.185)	(3.033)
Lev_t	0.032***	Lev_t	-0.484***	-0.236**
	(6.682)		(-3.216)	(-2.337)
ROA_t	-0.137***	ROA_t	1.996***	1.024**
	(-11.740)		(3.136)	(2.400)
$Growth_t$	0.020***	$Growth_t$	-0.279***	-0.143**
	(17.477)		(-3.007)	(-2.306)
$Big4/10_t$	-0.001	$Big4/10_t$	-0.015	-0.001
	(-0.517)		(-1.161)	(-0.070)
Board size$_t$	-0.009**	*Board size*$_t$	0.071	0.052
	(-2.085)		(1.203)	(1.318)
Independence$_t$	0.004	*Independence*$_t$	-0.024	0.065
	(0.261)		(-0.179)	(0.732)
$Top1_t$	0.008	$Top1_t$	-0.379***	-0.221***
	(1.221)		(-5.095)	(-4.427)
BM_t	-0.009***	BM_t	0.082*	0.041
	(-11.113)		(1.869)	(1.393)
Firmage$_t$	-0.003	*Firmage*$_t$	-0.147***	-0.113***
	(-0.507)		(-2.600)	(-2.972)
SOE_t	-0.007***	SOE_t	0.039	0.000
	(-2.679)		(0.891)	(0.004)
$absACC_t$		$absACC_t$	0.087	0.044
			(1.502)	(1.121)
CEO age$_t$	-0.003	*CEO age*$_t$	0.161**	0.077*
	(-0.493)		(2.562)	(1.837)
CEO gender$_t$	-0.008***	*CEO gender*$_t$	0.083*	0.036

	(-2.853)		(1.900)	(1.209)
CEO duality$_t$	0.001	*CEO duality*$_t$	0.006	0.003
	(0.685)		(0.374)	(0.279)
Constant	0.162***	Constant	-2.995***	-1.216**
	(4.856)		(-3.315)	(-2.008)
Firm FE	Yes	Firm FE	Yes	Yes
Year FE	Yes	Year FE	Yes	Yes
Observations	29,115	Observations	29,115	29,115
Adjusted R^2	0.130	Adjusted R^2	0.092	0.092

4.4.6.2. Decreasing corporate tax avoidance

Tax avoidance can be viewed as one of many alternative risky investment opportunities (Armstrong et al., 2015). Kim et al. (2011a) document that corporate tax avoidance increases stock price crash risk, consistent with the view that aggressive tax strategies can provide managers with the opportunity to withhold negative information, thus leading to higher crash risk. Therefore, we expect that CEOs with the early-life Cultural Revolution experience are more risk-averse and less likely to engage in tax avoidance, thereby reducing crash risk.

We examine whether CEOs with early-life Cultural Revolution experience can reduce stock price crash risk through decreasing corporate tax avoidance in Table 4.13. In the first-stage analysis, we analyse whether CEOs with early-life Cultural Revolution experience reduce tax avoidance. Following Chen et al. (2010) and Lei et al. (2022), we construct *Rate_diff* which is the differences between nominal and effective tax rates[57] to measure firm tax avoidance. The greater the *Rate_diff* is, the higher the level of tax avoidance. The coefficient on *CR* is negative and significant at the 10% level, which suggests that CEOs who experienced the Cultural Revolution in early life tend to adopt less aggressive tax policies. In the second-stage estimation, the fitted values generated from the first-stage estimation are used as the main independent

[57] The effective tax rate is equal to the actual income tax divided by total profits before tax.

variable, which captures the level of tax avoidance that can be explained by CEOs with early-life Cultural Revolution experience. As shown in Columns (1) and (2), the coefficients on *Predicted-Rate_diff* are all positive and significant at the 1% significance level. Overall, Table 4.13 suggests that CEOs with early-life experience reduce corporate tax avoidance, thereby decreasing stock price crash risk.

Table 4.13. Channel test: Reducing corporate tax avoidance

This table presents the impact of CEOs with early-life experience on stock price crash risk via reducing tax avoidance. The first stage reports the results of the impact of CEOs' early-life Cultural Revolution experience (*CR*) on tax avoidance (*Rate_diff*). The second stage presents the results of the impact of the predicted value of tax avoidance (*Predicted-Rate_diff*) on stock price crash risk ($Ncskew_{t+1}$ and $Duvol_{t+1}$). Control variables are the same as in Table 4.2. All continuous variables are winsorized at the 1% level in each tail. Appendix A presents the detailed variable definitions. Firm and year fixed effects are controlled for, and the t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

First stage		Second stage		
	$Rate\_diff_t$		$Ncskew_{t+1}$	$Duvol_{t+1}$
			(1)	(2)
CR_t	-0.005*	*Predicted-*	2.694***	1.665***
	(-1.835)	$Rate\_diff_t$	(3.413)	(3.136)
$Ncskew_t$		$Ncskew_t$	-0.055***	
			(-7.748)	
$Duvol_t$		$Duvol_t$		-0.062***
				(-8.973)
Ret_t		Ret_t	7.499***	4.894***
			(9.230)	(8.928)
$Sigma_t$		$Sigma_t$	-0.366	-0.593**
			(-0.998)	(-2.422)
$Dturn_t$		$Dturn_t$	-0.033**	-0.017*
			(-2.436)	(-1.849)
$Size_t$	0.005***	$Size_t$	0.048***	0.017**
	(2.744)		(3.819)	(1.997)
Lev_t	-0.009	Lev_t	-0.068	-0.030
	(-1.191)		(-1.319)	(-0.859)
ROA_t	0.933***	ROA_t	-1.692**	-1.034**
	(35.574)		(-2.232)	(-2.027)
$Growth_t$	0.001	$Growth_t$	-0.024**	-0.018**
	(0.340)		(-2.087)	(-2.286)
$Big4/10_t$	-0.002	$Big4/10_t$	-0.019	-0.003
	(-1.163)		(-1.370)	(-0.332)
$Board\ size_t$	-0.009	$Board\ size_t$	-0.036	0.002
	(-1.445)		(-0.792)	(0.061)
$Independence_t$	-0.025	$Independence_t$	0.079	0.135

	(-1.218)		(0.538)	(1.371)
$Top1_t$	0.025**	$Top1_t$	-0.398***	-0.243***
	(2.373)		(-5.262)	(-4.778)
BM_t	-0.012***	BM_t	-0.008	0.001
	(-9.766)		(-0.633)	(0.123)
$Firmage_t$	0.017*	$Firmage_t$	-0.201***	-0.142***
	(1.956)		(-3.340)	(-3.506)
SOE_t	0.003	SOE_t	-0.064**	-0.055***
	(0.606)		(-2.137)	(-2.721)
$absACC_t$	-0.026***	$absACC_t$	0.139**	0.069
	(-2.731)		(2.045)	(1.518)
$CEO\ age_t$	0.011	$CEO\ age_t$	-0.017	-0.012
	(1.251)		(-0.356)	(-0.366)
$CEO\ gender_t$	-0.000	$CEO\ gender_t$	-0.010	-0.012
	(-0.006)		(-0.346)	(-0.615)
$CEO\ duality_t$	0.003	$CEO\ duality_t$	0.013	0.002
	(1.031)		(0.726)	(0.160)
Constant	-0.135***	Constant	-0.223	0.127
	(-2.582)		(-0.649)	(0.548)
Firm FE	Yes	Firm FE	Yes	Yes
Year FE	Yes	Year FE	Yes	Yes
Observations	25,086	Observations	25,086	25,086
Adjusted R^2	0.292	Adjusted R^2	0.095	0.095

4.4.7. Further analysis

To explore the heterogeneity effect of CEOs with early-life Cultural Revolution experience on stock price crash risk, we further examine the role of internal and external monitoring mechanisms in the relationship. Effective internal and external corporate governance can play an important role in improving financial disclosure and reporting quality, thus reducing crash risk (Chen et al., 2017b; Yeung and Lento, 2018; Zhang et al., 2022b). We expect that the Cultural Revolution effect can be more pronounced in firms with weak internal and external governance (i.e., with weak internal control quality, without multiple large shareholders, and audited by non-Big 4/10 auditors).

4.4.7.1. Internal control quality

According to the previous literature (for example Feng et al., 2009), firms with ineffective internal control over financial reporting disseminate less reliable financial information. Chen et al. (2017b) find that high-quality internal control can reduce future stock price crash risk. Thus, firms with higher internal control quality tend to have better internal governance and lower crash risk. It's expected that CEOs' Cultural Revolution effect on crash risk can be more pronounced in firms with lower internal control quality.

Following Wang et al. (2018) and Wang et al. (2021), we employ internal control index (*IC*)[58], to measure firm internal control quality. *IC* is measured as the aggregated score ranging from 0 to 999 over five elements (i.e., internal environment, risk assessment, control activities, information and communication, and monitoring) of the internal control system and is further scaled based on 100 for adjustment. A firm with higher *IC* has better internal control quality, thus facing lower future crash risk. We divide our full sample into High-*IC* (Low-*IC*) firms if the internal control quality of firm *i* in year *t* is above (below) the median of all sample firms in the same industry and same year. We re-estimate Equation (4.4) using sub-samples respectively. Panel A of Appendix D shows that the coefficients on *CR* for High-*IC* subsamples (Columns (2) and (4)) are both negative and significant at the 5% level, while the coefficients on *CR* are not statistically significant for Low-*IC* subsamples in Columns (1) and (3). The results suggest that CEOs with early-life Cultural Revolution experience can play a more important role in reducing stock price crash risk in firms with weak internal control quality. The results are reported in Appendix D.

[58] Internal control index (IC) is obtained from DIB database.

4.4.7.2. Multiple large shareholders

Multiple large shareholders can play a valuable monitoring role in improving corporate governance and mitigating agency problems (Maury and Pajuste, 2005; Attig et al., 2008; Barroso et al., 2016; Jiang et al., 2018b; Li et al., 2021; Zhang and Li, 2022). Multiple large shareholders within a firm can balance the interest of each other well, which helps refrain the controlling shareholders from tunneling and force the controlling shareholders to disclose more information. Therefore, a firm with multiple large shareholders tends to have a lower future crash risk (Jiang et al., 2018a). We expect that CEOs' Cultural Revolution effect on crash risk is more pronounced in firms without multiple large shareholders.

Following prior studies such as Jiang et al. (2018a,b) and Li et al. (2021), we employ *Multiple* which is a dummy variable that equals one if a firm has more than one large shareholder (at least 10% shareholding), and 0 otherwise. We divide our sample into with-*Multiple* and without-*Multiple* subsamples. With-*Multiple* (Without-*Multiple*) subsample includes firms with (without) multiple large shareholders (shareholding>=10%). Then we re-estimate Equation (4.4) and the results are reported in Panel B of Appendix D. We find that the negative associations between *CR* and crash risk measures ($Ncskew_{t+1}$ and $Duvol_{t+1}$) are significant only for *Multiple*=0 subsamples, suggesting that the Cultural Revolution effect is more salient in firms with weak internal monitoring. The results are reported in Appendix D.

4.4.7.3. Auditing quality

Literature documents the important role of auditing quality in improving financial reporting quality (Fan and Wong, 2005; Behn et al., 2008; Yuan et al., 2016; Chen et al., 2017b; Choi et al., 2018). High-quality auditors are able to push their client firms to disclose more detailed and better-quality firm information in a timelier manner (Fan and Wong, 2005). Thus,

high-quality auditors can uncover bad news and reduce agency costs through their external monitoring role (Watts and Zimmerman, 1983; Khurana and Raman, 2004). For example, international Big 4 audit firms can enhance corporate transparency and reduce crash risk (Gul et al., 2010; Yeung and Lento, 2018). Also, Chinese domestic Big 10 audit firms in China supply higher quality audits (DeFond et al., 1999), and listed firms audited by Big 10 auditing firms have higher earnings quality (Lennox et al., 2016). Thus, CEOs with early-life Cultural Revolution experience could play a more important role in reducing crash risk in firms with weak auditing quality.

We split the full sample into *Big4/10*=1 and *Big4/10*=0 sub-samples based on *Big4/10* which is a dummy variable that equals one if a firm is audited by an international Big 4 audit firm or domestic Big 10 audit firm, and zero otherwise. Then we re-estimate Equation (4.4) and the results are reported in Panel C of Table 14. The coefficients on *CR* for *Big4/10*=0 subsamples (Columns (2) and (4)) are both negative and significant at the 1% level, while the coefficients on *CR* are not statistically significant for *Big4/10*=1 subsamples in Columns (1) and (3). The results suggest that CEOs' Cultural Revolution effect is more pronounced in firms with weak auditing quality. The results are reported in Appendix D.

4.5. Conclusion

Based on the theoretical framework of upper echelons theory and imprinting theory, we investigate the influence of CEOs' early-life Cultural Revolution experience on stock price crash risk. Using a large sample of Chinese listed firms, we find that CEOs who experienced the Cultural Revolution in their early life are more risk-averse and less likely to conceal bad news, thereby reducing stock price crash risk. Further analysis shows that the negative association between CEOs' early-life Cultural Revolution experience and crash risk is more

salient in firms with higher litigation risk. Especially, such a negative association is more pronounced if firms are involved in major lawsuits, in industries with high litigation risk, and in provinces with better legal development.

Our channel analysis suggests that firms having CEOs with early-life Cultural Revolution experience are less likely to engage in earnings management and tax avoidance, which explains the mitigating effect of CEOs' early-life Cultural Revolution experience on stock price crash risk. Finally, we document that effective internal/external monitoring mechanisms can play an important monitoring role, thus mitigating CEOs' Cultural Revolution effect.

Overall, the results suggest that the long-lasting imprints from Cultural Revolution experiences can shape CEOs' risk preferences and managerial decisions, thus greatly influencing stock price crash risk. The findings add new evidence to the upper echelons theory and imprinting theory.

4.6. Appendix

Appendix A. Variable definitions

This appendix reports the definition of the main variables used in this study.

Ncskew	The negative coefficient of skewness of firm-specific weekly returns in the fiscal year.
Duvol	The log of the ratio of the standard deviation of firm-specific weekly returns for down weeks to the standard deviation of firm-specific weekly returns for up weeks.
CR	A dummy variable that equals one if the CEO experienced China's Cultural Revolution (1966-1976) during the age of 13 and 18, and zero otherwise.
Ret	The average firm-specific weekly return in the fiscal year
Sigma	The standard deviation of firm-specific weekly returns in the fiscal year
Dturn	The average monthly turnover in the fiscal year minus the average monthly turnover in the year before the fiscal year
Size	The natural logarithm of total assets.
Lev	The book value of total debt divided by the book value of total assets.
ROA	Net income divided by total assets.
Growth	Growth in sales income.
Big4/10	A dummy variable that equals one if a firm is audited by an international Big 4 audit firm or domestic Big 10 audit firm, and zero otherwise.
Board size	The natural logarithm of the total number of directors on the board.
Independence	The proportion of independent directors to total number of directors on the board.
Top1	Percentage of shares owned by the largest shareholder.
BM	Book to market ratio.
Firmage	The natural logarithm of the number of years since a firm's establishment.
SOE	A dummy variable that equals one if the ultimate controller is an SOE or government agency, and zero otherwise.
absACC	The absolute value of the estimated residuals from the adjusted-Jones model (Dechow et al. 1995).
CEO age	The natural logarithm of the CEO's age.
CEO gender	A dummy variable that equals one if the CEO is male, and zero otherwise.

CEO duality	A dummy variable that equals one if the CEO and board chair positions are held by the same person, and zero otherwise.
Litigation dummy	A dummy variable that equals one if a firm is subject to a major lawsuit, and zero otherwise.
Industry-litigation risk	A dummy variable that equals one if a firm operates in a high litigation risk industry.
Legal environment	The province-level legal development index developed by NERI.
Transition	A dummy variable that equals one if firm i's transition year t is a CEO without revolution experience to a CEO with revolution experience transition and zero if firm i's transition year t does not involve any a CEO with revolution experience.
Post	A dummy variable which equals one if firm-year observations are after the CEO transition and zero otherwise.
Rate_diff	The differences between nominal and effective tax rates to measure firm tax avoidance, following Chen et al. (2010) and Lei et al. (2022).
Intensity	The intensity of the Cultural Revolution in each province.
CR-years	The natural logarithm of one plus the number of years that a CEO experienced China's Cultural Revolution (1966-1976) during the age of 13 and 18.
IC	Internal control quality obtained from DIB database.
Multiple	A dummy variable that equals one if a firm has more than one large shareholder (at least 10% shareholding).

Appendix B. "Send-down" movement population and Cultural Revolution intensity

This appendix reports the population that was involved in "Send-down" movement in each province during the Cultural Revolution and the intensity of the Cultural Revolution, calculated as Send-down population scaled by Population in each province.

Province	Send-down population	Population	*Intensity (*Send-down population / Population)
Beijing	636,300	8,100,278	7.86%
Tianjin	465,100	6,681,722	6.96%
Hebei	384,400	45,418,333	0.85%
Shanxi	264,300	21,204,683	1.25%
Inner Mongolia	193,800	15,274,722	1.27%
Liaoning	2,013,400	30,666,167	6.57%
Jilin	991,400	18,673,667	5.31%
Heilongjiang	1,519,200	25,676,944	5.92%
Shanghai	1,252,200	10,854,556	11.54%
Jiangsu	828,400	51,990,400	1.59%
Zhejiang	646,200	33,144,489	1.95%
Anhui	576,500	39,610,000	1.46%
Fujian	372,300	20,616,339	1.81%
Jiangxi	504,500	26,255,628	1.92%
Shandong	512,900	64,088,333	0.80%
Henan	673,000	60,713,889	1.11%
Hubei	886,600	40,104,122	2.21%
Hunan	635,800	44,872,294	1.42%
Guangdong	973,200	44,054,650	2.01%
Guangxi	434,800	28,541,667	1.52%
Sichuan	1,472,400	4,374,100	2.39%
Guizhou	213,500	61,616,500	0.97%
Yunnan	232,500	22,066,917	0.91%
Tibet	3,400	25,527,278	0.22%
Shaanxi	463,100	1,546,206	1.90%
Gansu	245,200	24,377,222	1.54%
Qinghai	43,600	15,920,872	1.51%
Ningxia	49,200	2,888,139	1.75%
Xinjiang	277,600	2,814,383	2.81%
Overall	17,764,800	789,574,222	2.25%

Appendix C. Correlation matrix

This table reports the Pearson correlation matrix for the variables in the analysis. Detailed definitions of variables are in Ap

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
1.Ncskew$_{t+1}$	1.000															
2.Duvol$_{t+1}$	0.876***	1.000														
3.CR$_t$	0.004	0.001	1.000													
4.Ncskew$_t$	0.054***	0.048***	0.012*	1.000												
5.Duvol$_t$	0.049***	0.045***	0.010	0.878***	1.000											
6.Ret$_t$	0.091***	0.081***	0.016**	-0.178***	-0.200***	1.000										
7.Sigma$_t$	-0.032***	-0.042***	-0.020***	-0.142***	-0.139***	0.440***	1.000									
8.Dturn$_t$	-0.015**	-0.021***	0.024***	-0.105***	-0.118***	0.439***	0.261***	1.000								
9.Size$_t$	-0.069***	-0.088***	-0.022***	-0.090***	-0.112***	-0.047***	-0.195***	0.087***	1.000							
10.Lev$_t$	-0.048***	-0.061***	0.080***	-0.051***	-0.063***	0.007	-0.005	0.122***	0.433***	1.000						
11.ROA$_t$	0.072***	0.067***	0.000	0.023***	0.012*	0.138***	-0.078***	-0.100***	0.026***	-0.346***	1.000					
12.Growth$_t$	0.040***	0.032***	0.004	0.014*	0.002	0.090***	0.037***	-0.040***	0.037***	0.058***	0.216***	1.000				
13.Big4/10$_t$	0.014*	-0.003	0.150***	0.007	-0.012*	0.027***	-0.120***	0.034***	0.337***	0.217***	0.109***	0.062***	1.000			
14.Board size$_t$	-0.035***	-0.029***	-0.092***	-0.034***	-0.029***	-0.034***	-0.048***	-0.047***	0.198***	-0.036***	0.050***	-0.026***	-0.037***	1.000		
15.Independence$_t$	-0.007	-0.014*	0.122***	-0.004	-0.011	-0.008	-0.091***	0.046***	0.195***	0.162***	0.015*	0.008	0.258***	-0.038***	1.000	
16.Top1$_t$	-0.015**	-0.013*	-0.062***	-0.017**	-0.014*	0.006	0.038***	-0.019**	0.040***	-0.036***	-0.008	-0.010	-0.119***	0.066***	-0.485***	1.000
17.BM$_t$	-0.009	-0.014*	0.104***	-0.003	-0.008	-0.016**	-0.086***	-0.032***	0.175***	0.073***	0.114***	0.042***	0.534***	0.015*	0.052***	-0.005
18.Firm age$_t$	-0.115***	-0.118***	0.047***	-0.044***	-0.042***	-0.254***	-0.243***	0.034***	0.582***	0.562***	-0.252***	-0.043***	0.195***	0.044***	0.158***	-0.012*
19.SOE$_t$	-0.081***	-0.078***	-0.174***	-0.105***	-0.106***	-0.039***	-0.019**	0.059***	0.276***	0.093***	-0.068***	-0.088***	-0.098***	0.161***	-0.097***	0.094***
20.absACC$_t$	-0.044***	-0.053***	0.180***	-0.050***	-0.062***	-0.006	-0.093***	0.117***	0.234***	0.263***	-0.078***	-0.039***	0.438***	-0.077***	0.292***	-0.120***
21.CEO gender$_t$	0.028***	0.024***	0.008	0.016**	0.008	0.035***	0.102***	-0.013*	-0.057***	0.069***	-0.061***	0.130***	0.011	-0.056***	-0.033***	0.008
22.CEO age$_t$	-0.012*	-0.013*	0.009	-0.001	-0.003	-0.003	-0.007	0.019**	0.027***	0.019**	-0.015**	-0.009	0.034***	-0.012*	0.086***	-0.066***
23.CEO duality$_t$	-0.028***	-0.025***	0.478***	-0.045***	-0.040***	-0.032***	-0.056***	-0.018**	0.171***	-0.007	0.033***	-0.045***	0.016**	0.111***	0.003	0.044***

Appendix D. Do monitoring mechanisms matter?

This table reports the regression results estimated by Eq. (4) using the sub-samples of firms with high internal control quality (High-*IC*)/low internal control quality (Low-*IC*) in Panel A, firms with multiple large shareholders (*Multiple*=1)/without multiple large shareholders (*Multiple*=0) in Panel B, firms are audited by Big 4/10 audit firm (*Big4/10*=1)/firms audited by non-Big 4/10 audit firm (*Big4/10*=0).

Panel A: Internal monitoring mechanism: Internal control quality

	High-*IC*	Low-*IC*	High-*IC*	Low-*IC*
	(1)	(2)	(3)	(4)
	$Ncskew_{t+1}$	$Ncskew_{t+1}$	$Duvol_{t+1}$	$Duvol_{t+1}$
CR_t	-0.035	-0.055**	-0.017	-0.030**
	(-1.506)	(-2.311)	(-1.109)	(-2.017)
$Ncskew_t$	-0.068***	-0.066***		
	(-7.016)	(-6.868)		
$Duvol_t$			-0.084***	-0.060***
			(-8.900)	(-6.564)
Ret_t	8.067***	5.416***	5.860***	2.865***
	(7.508)	(4.681)	(8.040)	(3.889)
$Sigma_t$	-0.422	0.021	-0.807**	-0.231
	(-0.841)	(0.043)	(-2.394)	(-0.734)
$Dturn_t$	-0.040**	-0.017	-0.030**	0.002
	(-2.022)	(-0.896)	(-2.281)	(0.167)
$Size_t$	0.084***	0.060***	0.037***	0.020*
	(5.016)	(3.641)	(3.275)	(1.910)
Lev_t	-0.163**	0.019	-0.080	0.020
	(-2.261)	(0.294)	(-1.644)	(0.488)
ROA_t	0.439*	0.251*	0.243	0.183*
	(1.954)	(1.685)	(1.598)	(1.939)
$Growth_t$	-0.034**	0.010	-0.022**	0.002
	(-2.167)	(0.568)	(-2.012)	(0.194)
$Big4/10_t$	-0.019	-0.029	0.002	-0.007
	(-1.047)	(-1.577)	(0.157)	(-0.618)
Board size$_t$	-0.101*	-0.040	-0.029	-0.029
	(-1.675)	(-0.633)	(-0.706)	(-0.718)
Independence$_t$	-0.119	0.061	0.050	0.014
	(-0.612)	(0.304)	(0.383)	(0.108)
$Top1_t$	-0.232**	-0.308***	-0.150**	-0.200***
	(-2.290)	(-3.029)	(-2.196)	(-3.096)
BM_t	-0.044***	-0.061***	-0.022***	-0.028***
	(-3.984)	(-4.472)	(-2.904)	(-3.272)
Firmage$_t$	-0.186**	-0.252***	-0.165***	-0.133**
	(-2.246)	(-3.003)	(-2.950)	(-2.495)
SOE_t	0.030	-0.092***	-0.014	-0.051**
	(0.666)	(-2.624)	(-0.459)	(-2.312)
$absACC_t$	0.033	0.149*	0.012	0.093*
	(0.385)	(1.699)	(0.200)	(1.667)
CEO age$_t$	0.016	0.174**	0.015	0.087*
	(0.200)	(2.140)	(0.279)	(1.683)
CEO gender$_t$	-0.057	0.036	-0.046*	0.015
	(-1.452)	(0.942)	(-1.711)	(0.609)
CEO duality$_t$	0.038	0.028	0.015	0.016
	(1.546)	(1.254)	(0.917)	(1.102)
Constant	-1.064**	-1.134**	-0.333	-0.268
	(-2.229)	(-2.366)	(-1.030)	(-0.883)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	14,628	14,487	14,628	14,487
Adjusted R^2	0.129	0.078	0.126	0.076

Panel B: Internal monitoring mechanism: Multiple large shareholders

	Multiple=1	*Multiple*=0	*Multiple*=1	*Multiple*=0
	(1)	(2)	(3)	(4)
	$Ncskew_{t+1}$	$Ncskew_{t+1}$	$Duvol_{t+1}$	$Duvol_{t+1}$
CR_t	-0.041	-0.051**	-0.005	-0.036***
	(-1.391)	(-2.523)	(-0.249)	(-2.633)
$Ncskew_t$	-0.115***	-0.065***		
	(-10.514)	(-7.830)		
$Duvol_t$			-0.120***	-0.082***
			(-11.161)	(-9.880)
Ret_t	6.673***	6.700***	3.545***	4.249***
	(5.452)	(6.837)	(4.253)	(6.431)
$Sigma_t$	-0.217	-0.304	-0.258	-0.728**
	(-0.391)	(-0.692)	(-0.699)	(-2.495)
$Dturn_t$	-0.052***	-0.028	-0.030**	-0.011
	(-2.743)	(-1.598)	(-2.366)	(-0.942)
$Size_t$	0.065***	0.070***	0.032**	0.014
	(3.054)	(4.596)	(2.222)	(1.407)
Lev_t	-0.021	-0.105*	-0.020	-0.024
	(-0.250)	(-1.717)	(-0.355)	(-0.600)
ROA_t	0.150	0.237	0.012	0.201**
	(0.779)	(1.620)	(0.096)	(2.053)
$Growth_t$	-0.015	-0.020	-0.016	-0.014
	(-0.851)	(-1.380)	(-1.288)	(-1.408)
$Big4/10_t$	-0.035	-0.026	-0.011	-0.006
	(-1.531)	(-1.594)	(-0.744)	(-0.518)
$Board\ size_t$	-0.005	-0.034	0.022	0.018
	(-0.062)	(-0.627)	(0.436)	(0.507)
$Independence_t$	0.119	-0.039	0.207	0.048
	(0.494)	(-0.226)	(1.282)	(0.418)
$Top1_t$	-0.472***	-0.416***	-0.217**	-0.233***
	(-2.930)	(-4.031)	(-2.096)	(-3.734)
BM_t	-0.060***	-0.050***	-0.036***	-0.021***
	(-4.090)	(-4.647)	(-3.676)	(-2.882)
$Firmage_t$	-0.331***	-0.198**	-0.211***	-0.152***
	(-3.194)	(-2.557)	(-3.038)	(-2.951)
SOE_t	-0.050	-0.045	-0.025	-0.042
	(-1.120)	(-1.167)	(-0.834)	(-1.621)
$absACC_t$	0.005	0.121	0.017	0.049
	(0.046)	(1.604)	(0.248)	(0.967)
$CEO\ age_t$	0.062	0.157**	0.030	0.076
	(0.623)	(2.192)	(0.453)	(1.594)
$CEO\ gender_t$	-0.007	-0.031	-0.004	-0.024
	(-0.143)	(-0.879)	(-0.118)	(-1.035)
$CEO\ duality_t$	-0.005	0.017	-0.004	0.006
	(-0.182)	(0.805)	(-0.207)	(0.454)
Constant	-0.833	-1.290***	-0.384	-0.160
	(-1.388)	(-3.001)	(-0.951)	(-0.560)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	11,148	17,967	11,148	17,967
Adjusted R^2	0.100	0.091	0.103	0.098

Panel C: External monitoring mechanism: Auditing quality

	Big4/10=1	*Big4/10*=0	*Big4/10*=1	*Big4/10*=0
	(1)	(2)	(3)	(4)
	$Ncskew_{t+1}$	$Ncskew_{t+1}$	$Ncskew_{t+1}$	$Ncskew_{t+1}$
CR_t	-0.008	-0.068***	-0.001	-0.038***
	(-0.291)	(-3.142)	(-0.082)	(-2.607)
$Ncskew_t$	-0.089***	-0.081***		
	(-8.992)	(-9.042)		
$Duvol_t$			-0.100***	-0.090***
			(-10.200)	(-10.107)
Ret_t	9.490***	5.341***	5.972***	3.136***
	(8.245)	(5.206)	(7.699)	(4.469)
$Sigma_t$	-0.408	-0.066	-0.646*	-0.299
	(-0.795)	(-0.143)	(-1.903)	(-0.963)
$Dturn_t$	-0.055***	-0.024	-0.034***	-0.005
$Size_t$	0.032	0.072***	0.010	0.026**
	(1.623)	(4.711)	(0.752)	(2.505)
Lev_t	-0.063	-0.072	-0.042	-0.032
	(-0.792)	(-1.161)	(-0.794)	(-0.769)
ROA_t	-0.082	0.276*	-0.009	0.144
	(-0.454)	(1.809)	(-0.076)	(1.391)
$Growth_t$	-0.004	-0.020	-0.009	-0.015
	(-0.206)	(-1.378)	(-0.733)	(-1.520)
Board size$_t$	-0.133*	-0.037	-0.054	-0.001
	(-1.821)	(-0.654)	(-1.104)	(-0.029)
Independence$_t$	-0.216	0.051	-0.032	0.104
	(-0.954)	(0.283)	(-0.212)	(0.860)
$Top1_t$	-0.342***	-0.285***	-0.143*	-0.200***
	(-2.834)	(-3.047)	(-1.853)	(-3.316)
BM_t	-0.041***	-0.058***	-0.021**	-0.026***
	(-3.254)	(-4.732)	(-2.509)	(-3.100)
$Firmage_t$	-0.233**	-0.229***	-0.208***	-0.127**
	(-2.189)	(-2.987)	(-2.940)	(-2.448)
SOE_t	-0.058	-0.061*	-0.031	-0.046**
	(-1.031)	(-1.862)	(-0.830)	(-2.092)
$absACC_t$	0.088	0.145*	0.043	0.085
	(0.931)	(1.872)	(0.688)	(1.623)
	(-2.968)	(-1.336)	(-2.773)	(-0.390)
CEO age$_t$	-0.002	0.188**	0.018	0.099**
	(-0.026)	(2.525)	(0.302)	(1.974)
CEO gender$_t$	-0.017	-0.015	-0.034	-0.006
	(-0.389)	(-0.402)	(-1.215)	(-0.232)
CEO duality$_t$	0.033	0.011	0.016	0.006
	(1.311)	(0.513)	(0.933)	(0.393)
Constant	0.269	-1.485***	0.408	-0.561*
	(0.475)	(-3.395)	(1.085)	(-1.888)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	13,502	15,613	13,502	15,613
Adjusted R^2	0.108	0.097	0.104	0.099

CHAPTER FIVE CONCLUSION

5.1. Main findings and implications

This thesis sheds light on the effects of CEO characteristics on firm behaviours in the Chinese market. The first essay highlights the importance of CEO pay disparity on firm performance. We find that a large CEO pay disparity can provide non-CEO top executives with strong tournament incentives to make greater effort for promotion to the next CEO, thereby promoting firm performance. This finding is in line with the rank-order tournament theory (Lazear and Rosen, 1981) and emphasizes that CEO pay disparity can be used as an effective corporate governance mechanism to enhance firm performance in China. Further, we find that the characteristics of CEO and non-CEO top executives moderate the effectiveness of the positive tournament effect. In addition, this essay investigates the effectiveness of the 2015 "pay ceiling" regulation and finds that this regulation significantly reduces CEO pay disparity and the positive tournament effect on firm performance in SOEs. Although the pay ceiling regulation contributes to social fairness, this finding shows this regulation's potential side effects. We argue that policy-makers should thoroughly consider all possible side effects when limiting the compensation of top executives in SOEs.

Essay two investigates the influence of CEOs' early-life experience of China's Cultural Revolution on corporate accounting conservatism. We document that CEOs who experienced the Cultural Revolution in early life are more risk-averse and conservative, and thereby are associated with a higher level of accounting conservatism. Moreover, the Cultural Revolution effect is more salient in an environment with stronger political influence, e.g., in provinces with higher political risks, and in SOEs where CEOs' political career concerns are more pronounced. This result shows the important role of political influence in Chinese listed firms.

In addition, we find that firms managed by a CEO with early-life Cultural Revolution experience tend to have higher provisions for liabilities and less earnings manipulation, indicating the risk-averse preference of such CEOs. By providing evidence that CEOs' early-life Cultural Revolution experience increase accounting conservatism, this essay supports the upper echelons theory (Hambrick and Mason, 1984; Hambrick, 2007) and the imprinting theory (Marquis and Tilcsik, 2013).

Essay three provides new evidence showing the influence of CEOs' early-life Cultural Revolution experience on stock price crash risk. Results of this essay show that CEOs with early-life Cultural Revolution experience are more risk-averse and less likely to conceal bad news, and thereby are associated with lower stock price crash risk. Such influence is more pronounced when firms are facing higher litigation risk. The channel analysis shows that CEOs with early-life Cultural Revolution experience are less likely to engage in earnings manipulation and tax avoidance, which explains the mitigating effect of CEOs' early-life Cultural Revolution experience on crash risk. Essay three highlights the important role of CEO early-life traumatic experiences and adds evidence on the influencing factors of stock price crash risk.

5.2. Limitation and future research

The essays in this thesis have limitations that may give rise to opportunities for further research. The first essay studies the association between CEO pay disparity and firm performance in China. We examine the moderating effects of managerial characteristics on the relation between CEO pay disparity and firm performance. However, corporate governance mechanisms (e.g., institutional investors and board of directors) and cultural factors can also affect tournament incentives (Burns et al., 2017). We have not studied the moderating effects of these factors and we leave this issue to future research. Moreover, this essay finds that female

non-CEO top executives significantly reduce the positive tournament effect. Future research may further explore the sensitivity of female non-CEO top executives such as female CFOs to tournament incentives.

Essay two and essay three investigate the effect of CEOs' early-life Cultural Revolution experience on accounting conservatism and stock price crash risk, respectively. First, CEO birthplace information has a considerable attrition rate because of the limitations of the CSMAR database. Although we manually collected some missing CEO birthplace information through Google and Baidu browsers, we still cannot get all CEOs' birthplace information. Future research may gather more background information via multiple sources to study the impact of CEOs' early-life experience on firm behaviour. Second, although our findings are consistent with the predictions from the upper echelons theory and the imprinting theory, we do not directly study the psychological growth led by personal reflection and rumination. Future research may adopt a survey-based research design to capture CEOs' reflections on these events.

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