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Abstract

This study investigates the application of Relative Performance Evaluation (RPE) theory on forced CEO turnover decisions in the context of Chinese listed firms. Using CEO dismissal data spanning from 2009 to 2019, we observe a negative correlation between industry peer performance and the likelihood of forced CEO turnover, which contradicts the assumption of RPE theory. Furthermore, we emphasize the significance of considering Non-Financial Performance Measures (NFPMs) in CEO turnover research. Our research reveals that the extent of excess employment is negatively associated with the probability of forced CEO dismissal, and it also affects how a firm responds to peer performance. Specifically, when firms exhibit high social performance, proxied by excess employment, they tend not to lay off more CEOs due to industry downturns. This study offers a potential explanation for Jenter and Kanaan (2015)'s puzzle of why firms terminate more CEOs when their industry experiences a recession. We argue that prior literature, which predominantly focuses on the relationship between financial performance and CEO turnover, may be incomplete. It is imperative to also account for the impact of NFPMs.

Key words:

Relative performance evaluation, excess employment, forced CEO turnover, Chinese listed firms

JEL classification: G32, M21, M41

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1 Introduction

Providing CEOs with reasonable managerial incentives and objectively evaluating their efforts are important issues in the field of corporate governance. As an essential part of managerial incentives, whether to dismiss a CEO due to his/her failure to meet the firm's requirements thus is paid attention by plenty of academic researchers, as it provides significant insights about the governance policy (Jensen & Murphy, 1990). Prendergast (1999) points out, dismissal threat is the most essential form of nonlinear incentive contracts, where compensations are not strongly correlated with performance, but poor performance is punished by dismissal. Similarly, Tirole (2001) argues that the result of managers' fear of losing their jobs is more complex than the monetary rewards, due to its link from firm performance to CEO retain reward cannot be fully controlled by a contract. Despite this, it is a common practice for the principals to measure the CEO's performance by firm's financial performance when the CEO's behavior cannot be directly and comprehensively observed. Relative Performance Evaluation (RPE) theory suggests when evaluating the efforts of agents, the performance of peers who face common risks with the agents should be referred to and excluded (Holmstrom, 1982). In prior literature, the industry and market performance are generally used as the peer performance.

While the CEO turnover literature is believed to largely parallel that of CEO compensation (Engel et al., 2003), prior research finds mixed and even weaker evidence of RPE in CEO turnover decisions than in the CEO pay setting (e.g., Ali et al., 2009; Defond & Park, 1999; Jayaraman et al., 2021; Jenter & Kanaan, 2015). In addition, the majority of discussions in prior research on the impact of RPE on CEO turnover have primarily focused on American and European enterprises. In contrast, there is a notable scarcity of studies pertaining to Chinese businesses. Despite some literature exploring the relationship between firm-specific performance and CEO turnover in Chinese listed firms, they have not incorporated peer performance into discussion (Firth et al., 2006; Kato & Long, 2006; Lin & Su, 2009). As Jenter and Kanaan (2015, p.2158) argued, "a correctly specified CEO turnover regression needs to include both firm-specific and peer group performance as explanatory variables". Moreover, the majority of prior literature regarding RPE usage in CEO turnover is mainly developed based on the traditional shareholder value maximization, in which the firm's superior financial performance is the main indicator agents' performance. However, little consideration is considered to the potential effects of non-financial performance measures on CEO turnover decisions. As mentioned by Fee et al. (2018), firms may not exclusively rely on financial performance, often proxied by accounting or stock measures, when making decisions. A typical example is that CEOs with political connections to the government are less likely to be dismissed in Chinese listed firms (Cao et al., 2017; Cheng & Leung, 2016; You & Du, 2012; Zhang et al., 2022).

However, this work only focuses on how political consideration affect the turnover-firm performance sensitivity and ignore the fact that the quality of a CEO is not solely a function of firm performance but is also significantly influenced by exogenous shocks, such as industry and market movement.

In this work, we focus on three research questions as follows to address the abovementioned research gaps. First, we test whether peer financial performance is considered in forced CEO turnover decisions in Chinese listed firms, namely the RPE usage. Second, we follow Tirole (2001), who suggests expanding the definition of corporate governance from traditional shareholder value to the broader concept of the "stakeholder society". According to this assumption, managerial incentives should be aligned with the surpluses of all stakeholders, not just equity holders. Therefore, it could better represent interests of non-investing parties, such as employees and the government. We believe that Chinese firms are an ideal research object under this assumption, because China's economy still bears the deep imprint of the close relationship between firms and the government that developed from the planned economy. We investigate whether excess employment matters for forced CEO turnover decisions. While excess employment may reflect a variety of factors such as firms' management strategy, financial condition, firm performance, risk, or firm organization, in this work, in alignment with Wang and Shailer (2022) and Lim et al. (2018), we treat excess employment as a social performance and non-financial performance. Finally, we focus on the competitive relationship between Non-Financial Performance Measures (NFPMs) and Financial Performance Measures (FPMs)-based RPE on forced CEO turnover decisions and attempt to release whether different levels of social performance affect the impact of peer performance on forced CEO turnover decisions.

Using the China Stock Market and Accounting Research (CSMAR) database, we collect CEO turnover data of Chinese listed firms spanning from 2009 to 2019, and 21,300 firm-year observations constitute our research objects. We use returns of assets (ROA) as our financial performance measures to generate both firm-adjusted and industry performance. We develop our hypothesis to explain why we argue firms with high excess employment are less likely to accrue forced CEO turnover. Finally, as a supplemental test for this hypothesis, we examine the condition effect of excess employment on weak-form RPE usage in forced CEO turnover. Our findings could be concluded as follows. First, we find that the BODs/government did consider peer performance from the same industry of focal firms when deciding whether the CEOs are fired due to underperformance. However, in most cases, peer performance is significantly negatively related to

the likelihood of forced CEO turnover, which is inconsistent with the RPE theory, similar to what prior empirical literature has found. Therefore, we do not find evidence of RPE usage in forced CEO turnover decisions in Chinese listed firms. Second, we find that firms with higher excess employment are less likely to fire their CEOs, and thus, our hypothesis is supported. Compared to the firm-specific and industry ROA, excess employment has far less influence on forced CEO turnover than the two formers. This means FPMs are still the main effects of forced CEO turnover decisions. Finally, we find that the influence of peer performance on forced CEO turnover is distinct according to the extent of excess employment. Our grouped regressions show that the negative relationship between peer performance and forced CEO turnover merely arises in the low excess employment subgroup, and the negative effect of peer performance no longer significantly matters in the higher subgroup. It means that firms with higher excess employment do not fire more CEOs due to the whole industry recession. This finding shows that after excluding exogenous performance shocks due to excess employment, the board of directors partially corrects their mistake of attributing exogenous performance shocks to the CEO.

Our study contributes to the literature in the following ways. From the theoretical perspective, we analyze the similar effects of RPE theory and NFPMs in mitigating agency problems. This analysis serves to supplement the limitations of RPE theory, which overly relies on FPMs while neglecting the significance of NFPMs. The competitive interplay between these elements is poised to impact the application of RPE in decisions related to forced CEO turnover within firms. This finding aids in unraveling the puzzle of why NFPMs are not frequently used in RPE contracts. We recommend that future research on RPE extend beyond the confines of FPMs and also encompass a comprehensive exploration of NFPMs. Furthermore, we apply the Political Cost Hypothesis and enrich the essential impact of social performance on CEO turnover literature. Shifting to the empirical perspective, we examine and provide new evidence about applying REP usage in forced CEO turnover for Chinese listed firms. We thus make up for the shortcomings of prior studies, which show that RPE in CEO turnover is concentrated in European and American countries but ignores developing countries. In addition, we complement the mixed results in previous research on using excess employment as a proxy for social performance in all Chinese listed firms. The empirical results prove our view that excess employment as a social performance has a significantly negative impact on forced CEO turnover. Finally, the finding that a negative relationship between peer performance and forced CEO turnover merely arises in the low excess employment group provides evidence for the discussion concerning "why more CEOs are fired when their peer group is not doing well" from Jenter and Kanaan (2015, p. 2174).

This study is organized as follows: Section 2 reviews the literature on RPE usage, political consideration, and NFPMs in CEO turnover. Section 3 clarifies our research questions and develops our testable hypothesis. Section 4 describes the empirical research design, including sample selection and model specification. Section 5 presents empirical results for baseline and robust check regressions. Section 6 summarizes and concludes.

2 Literature Review

2.1 Literature Review on RPE Usage in CEO Turnover

The Informative Signal Theory (Holmstrom, 1979) posits that any additional signal or information reflecting the efforts of agents can enhance the effectiveness of compensation contracts. Based on this theory, Holmstrom (1982) formulated the RPE theory, asserting that agents should be evaluated using metrics that filter out factors unrelated to effort or ability. According to this theory, the performance evaluation system for agents should incorporate the performance of peers who face similar common risks. RPE theory, thus, can alleviate the information asymmetry stemming from an evaluation system solely reliant on firm performance. In theory, the advantages of RPE for both agents and principals are apparent. RPE provides principals with more information about agents' efforts and, at the same time, mitigates agents' exposure to unnecessary exogenous risks. Although the implementation of RPE is not costless, it seems not so expensive when it is applied to executives' compensation contracts (Gibbons & Murphy, 1990). Prior empirical literature typically incorporates industry or market-adjusted financial performance into the performance evaluation of top executives and observes whether these peer performances are positively related to their managerial incentives to examine RPE theory.

Though the development of CEO turnover literature is largely parallel to that of CEO compensation (Engel et al., 2003), Bertrand and Mullainathan (2001) stress that turnover and compensation policies play quite distinct roles in incentivizing managers. Parrino (1997) points out that the availability of a qualified outside candidate and precise information concerning firm performance relative to industry or market-level average are essential factors influencing CEO turnover decisions. RPE provides a more precise measure of CEO performance; it is logical to expect the board of directors to find RPE useful in identifying underperformance CEOs (Defond & Park, 1999). Corporate boards learn the quality of the CEO from firm performance and other signals, such as peer performance from a group of peer firms subject to similar industry and market shocks. If the assessment of quality falls below some threshold, then dismissal arises (Jenter & Kanaan, 2015). As

long as CEOs cannot take actions to affect the measured performance of the other firms in the industry or market, basing dismissals on relative performance yields incentives to increase shareholder wealth while filtering out exogenous risks (Pisarov, 2017). The fundamental rationale for RPE—to increase the signal-to-noise ratio of the performance measure—applies to replacement decisions just as it applies to compensation choices (Jayaraman et al., 2021). Besides, Huson et al. (2004) emphasize the importance of dividing voluntary and forced turnover since only forced turnover reflects the quality of monitoring. Jayaraman et al. (2021) underline the necessity of using RPE theory when deciding (forced) CEO turnover since "If managers are forced to leave office due to factors beyond their control, it would discourage ex-ante managerial efforts or require inefficiently high pay to compensate for the unnecessary job risk" (Peters & Wagner, 2014, p.357).

However, empirical research on RPE in CEO turnover decisions presents mixed and sometimes weaker evidence compared to its application in CEO compensation (e.g., Ali et al., 2009; Barro & Barro, 1990; Defond & Park,1999; Gibbons & Murphy, 1990; Jayaraman et al., 2021; Jenter & Kanaan, 2015; Warner et al., 1988). For instance, while Gibbons and Murphy (1990) support the RPE theory, Jenter and Kanaan (2015) raise doubts about their argument. Using CEO turnover data from Forbes of 1,104 firms spanning from 1974 to 1986, Gibbons and Murphy (1990) reveal a positive and significant correlation between the likelihood of CEOs' turnover and firm stock returns, as well as industry and market value-weighted returns. However, when industry and market-level peer performance were included in the same regression, only market performance maintained a positive correlation with the likelihood of CEO turnover. This suggests that CEO turnover decisions are more sensitive to market shocks than narrow industry-level ones. In a study analyzing 2,490 voluntary and 875 forced CEO turnovers from 1993 to 2009, Jenter and Kanaan (2015) find CEOs more likely to be replaced when industry or market-level performance decreased, strongly rejecting the RPE argument. Fee et al. (2018) conduct a meticulous review of CEO turnover literature on RPE, proposing an empirical strategy using a standard modeling approach that uses generic, including both so-called voluntary and forced turnover, uses untransformed simple annual performance returns, and uses the logit model rather than Cox hazard model. They compare influential works like Gibbons and Murphy (1990) and Jenter and Kanaan (2015), concluding that slight changes in modeling choices or timing issues could alter conclusions, casting doubt on the role of industry performance in CEO turnover decisions. Recently, Jayaraman et al. (2021) argue that the failure to detect strong-form RPE in CEO replacement decisions is attributed to the noisy peer groups used in prior studies and the limited number of peers available in practice. They generate peer performance based on product market peers, finding robust evidence supporting RPE usage in CEO turnover decisions.

In the case of China, the research concerning whether CEOs or chairmen are punished for inferior firm performance also arises. For instance, Firth et al. (2006) observe chairman departure data from 1998 to 2002, revealing a notably high incidence of forced chairman turnover. Similarly, Kato and Long (2006) employ data from a similar timeframe for Chinese listed firms, finding a significant and negative correlation between CEO turnover likelihood and inferior firm performance, measured by either stock return performance or accounting metrics, albeit with a moderate magnitude. Furthermore, Lin and Su (2009) contribute findings that highlight distinctions between SOEs and non-SOEs regarding the link between suboptimal firm performance and an increased probability of CEO turnover. Their study indicates that the negative correlation between poor current and lagged firm-level ROA and CEO turnover is discernible predominantly in non-SOEs rather than in SOEs. They posit that state ownership mitigates the impact of managerial incentives. Moreover, recent research by Chang (2022) unveils a positive association between idiosyncratic crash risk and the likelihood of forced CEO turnover. Notably, this relationship is more accentuated in non-SOEs compared to SOEs. However, the application of RPE in forced CEO turnover decisions in the context of China remains a subject of limited exploration.

2.2 Literature Review on Excess Employment in CEO Turnover

The political and monitoring environment exerts a profound influence on corporate governance dynamics (Firth et al., 2006). Given the widespread government intervention in the Chinese economy and business environment (Lee et al., 2014), prior studies have explored the impact of political considerations on top management turnover decisions. The underlying rationale of these studies is rooted in the premise that the political connection of top management and the firm's social responsibilities significantly affect the behavior of the board of directors and subsequently, firm value. Drawing primarily from agency theory and resource dependence theory, prior research provides robust evidence indicating that CEOs or Chairmen with political connections, such as membership in the Communist Party of China or a former government officer, are less prone to termination or departure from the firm. For instance, You and Du (2012), employing an extensive sample of Chinese listed firms spanning from 2005 to 2008, reveal that CEOs with political connections are less likely to face termination. Moreover, the sensitivity of forced turnover to poor firm performance is weaker for these connected CEOs compared to their non-connected counterparts. Cheng and Leung (2016) corroborate that management turnover occurs less frequently when the Chairman or CEO possesses political connections with the government. This confirmation is extended by Cao et al. (2017) , who validate these results in Chinese-listed private firms using an

expanded dataset from 2005 to 2011. Recently, Zhang et al. (2022) scrutinize the impact of social capital on CEOs' involuntary turnover, discovering that CEOs with more political capital are less likely to face dismissal. Furthermore, He et al. (2014) and Brahma et al. (2023) both find that political connections exert significant and positive influences on both SOEs and private firms and more pronounced in the latter. These findings stress the political value and the nature of ownership.

Based on the abundant evidence regarding the turnover of politically connected top management members, prior studies have explored the relationship between policy burden and top management turnover. This is particularly relevant in the Chinese context, where maintaining a relatively low unemployment rate is crucial for social stability (Bai et al., 2006; Fu & Sun, 2023; Gu et al. 2020; Wang & Luo, 2019) . Additionally, the employment rate also serves as one of the indicators used by the central government to assess the performance of local officials (Jian et al., 2020; Vo, 2010). In addition, Liao et al. (2009) find that the increased policy burden reduces the sensitivity of chairman turnover to firm performance using the Chinese listed SOEs sample spanning from 2000 to 2005. However, they do not find excess employment is an independent factor affecting the chairman's departure. In contrast, Liu and Zhang (2018) use executive turnover data from Chinese listed firms from 1999 to 2012 and find that excess employment significantly and positively affects executive turnover only for local and provincial SOEs, but not for private firms or central SOEs. They argue that the executive evaluation mechanism for SOEs depends on distinct levels of government intervention. In addition, some literature has attempted to figure out the potential correlation between the political connection of CEOs or Chairmen and the extent of excess employment and their impact on turnover decisions. For instance, Wang and Wang (2013) find that the extent of excess employment in Chinese SOEs is positively related to the firm's political connections with the government when the chairman has a government background. They do not find that chairmen are significantly compensated by supporting the overstaffing. Moreover, Zhang et al. (2022) present further evidence concerning the relationship between the influence of politically connected management members and policy burden. They find that firms with politically connected chairmen and/or CEOs have higher policy burdens, proxied by excess employment, than non-connected peers. They point out that employing more employees than is necessary is a direct channel through which politically connected top management members influence firm performance.

2.3 Literature Review on NFPMs in CEO Turnover

As Informative Signal Theory (Holmstrom, 1979) stated, any performance measures providing incremental external information regarding agents' efforts could improve the efficiency of their

compensation contracts. Prior literature has verified that the benefits of including NFPMs in managerial contracts are multi-faced. For example, including NFPMs in compensation contracts could provide extra information regarding executive actions (Davila & Venkatachalam, 2014), increase the robustness of noisy financial performance measures (Feltham & Xie, 1994), align or compensate executive actions which may not be reflected in traditional financial performance measures (Schiehll & Bellavance, 2009). In addition, using NFPMs in managerial compensation contracts could encourage executives to focus on the firm's long-term goals rather than short-term behaviors such as earnings management (Gan et al., 2020; Shin et al., 2023; Tahir et al., 2019). However, the empirical research on whether incorporating NFPMs in managerial compensation increases pay-performance sensitivity yields mixed evidence. Cho and Ibrahim (2022) support this argument, while Liao et al. (2009) conclude that it decreases pay-performance sensitivity for SOEs in the case of China. Despite the growing usage of non-financial indicators (Schiehll & Bellavance, 2009) and the apparent appeal of NFPMs, the evaluation of CEOs' performance still predominantly relies on financial criteria (Epstein & Roy, 2005). Concurrently, RPE remains silent on addressing the potential issues arising from overly intensive financial performance measures. Gong et al. (2011), based on statistics concerning performance measures used by RPE firms in top executives' compensation contracts, find that only a small ratio of firms incorporates non-financial performance metrics in RPE contracts. Ferri (2009) posits that the infrequent use of NPFMs potentially reflects challenges in obtaining non-financial information from peer firms.

3 Hypothesis Development

The existing body of literature is limited in its exploration of whether RPE is employed in the decision-making process surrounding forced CEO turnover in Chinese listed firms. A related prior work is Lin and Su (2009), who only include firm performance adjusted by the industry median and claimed that they had considered the relative performance evaluation. However, they did not include peer performance in their model. As Jenter and Kanaan (2015) mentioned, CEO dismissals are determined jointly by firm performance and industry/market performance, and thus, the correct regression should include both firm-specific and peer performance measures. Therefore, so far, little is known about whether peer performance is incorporated into consideration concerning forced CEO turnover in Chinese listed firms. Next, we first attempt to test this question.

Politicians possess the authority to enforce wealth transfers from firms to themselves (Stigler, 1971). However, "the incentives provided by the political process (to reduce earnings) are in direct opposition to the incentives provided by management compensation contracts (to increase earnings)

to the level of reported earnings" (Watts & Zimmerman, 1978, p. 243). Consequently, "the procedure that is optimal for political or regulatory reasons may not be optimal for management compensation purpose" (Watts & Zimmerman, 1978, p. 243). The political cost hypothesis (Watts & Zimmerman, 1978, 1986) also explains managerial decisions, including the decision to retain or fire a CEO. Several studies using Chinese listed firms as examples show that top managers with political connections are less likely to be fired than those without political connections (Cao et al., 2017; Cheng & Leung, 2016; You & Du, 2012; Zhang et al., 2022), and hiring more employees than the firm actually needs is a direct channel for them to develop political connections with the government (Wu et al., 2012). However, in practice, the performance of CEOs is mainly evaluated by financial criteria (Epstein & Roy, 2005). The influence of non-financial performance indicators on CEO dismissal decisions has received insufficient attention in most literature.

The government needs to fulfill its social responsibilities through firms, such as keeping the unemployment rate low to maintain social stability (Bai et al., 2006; Fu & Sun, 2023; Gu et al. 2020; Wang & Luo, 2019). Moreover, the employment rate is also an essential part of how superior authorities measure the performance of local government officials in China. Existing evidence suggests that excess employment is not exclusive to state-owned enterprises and holds similar value for private firms as well (Lee et al., 2017; Wang & Shailer, 2018, 2022). Under the assumption of controlling firm financial performance, we posit that a firm's commitment to social performance will reduce the possibility of its CEO being dismissed. This effect becomes more pronounced with an increase in excess employment, thus forming our hypothesis:

H1: *Ceteris paribus*, excess employment exhibits a negative relation with the likelihood of forced CEO turnover.

In the following subsection, we incorporate the impact of excess employment on CEO dismissal decisions into RPE, where financial performance measures are usually relied on. As aforementioned, the non-financial performance measures have similar effects on mitigating weak and noisy financial performance and releasing information asymmetry between agents and principals to financial performance-based RPE. Despite this, NFPMs are infrequently integrated into RPE contracts (Ferri, 2009; Gong et al., 2011). Existing literature remains notably silent on addressing the potential pitfalls of an overly intensive reliance on financial performance measures in RPE. Therefore, our subsequent inquiry aims to explore the underexplored competitive relationship between NFPMs and FPMs in forced CEO turnover decisions. Specifically, we will analyze the distortion of financial

performance induced by the presence of excess employment. We argue that varying degrees of excess employment could affect the impact of peer performance on forced CEO turnover decisions.

Generally speaking, hiring more employees than a firm requires negatively impacts the purpose of maximizing enterprise value, although firms may receive other forms of compensation for this. For example, firms may receive government subsidies and policy preferences, more low-interest loan opportunities, and be more likely to be selected for an IPO due to burdening excess employment. However, such compensation comes in various forms, and its effects may not necessarily be reflected in financial performance, or the period in which it is reflected in financial performance is too long and difficult to attribute. Therefore, we argue that the presence of excess employment distorts financial performance's portrayal of a firm's actual state, making financial performance noisy. And as excess employment grows, the noise inherent in financial performance is likely to intensify. Especially in high-excess employment firms, the actual operating conditions of the firms, as depicted by financial performance, and the peer performance based on this calculation will be more distorted. This argument is partially supported by a finding from Liao et al. (2009), who find that excess employment can significantly reduce the sensitivity of forced CEO turnover and firm performance. However, there is little prior literature exploring the sensitivity of peer performance turnover, an instrumental issue suggested by Jenter and Kanaan (2015). Therefore, we are prompted to investigate whether the board of directors mistakenly attributes exogenous performance shocks to CEOs when faced with the common risk that corporate financial performance is distorted by excess employment. Specifically, we treat excess employment as an exogenous performance effect and observe the response of peer performance (industry financial performance) to forced CEO turnover by dividing high EE groups and low EE groups, respectively.

4 Research Design

4.1 Sample Selection

Our analysis is made based on a sample of China’s SOEs and private firms that are listed on the Shanghai and Shenzhen Stock Exchanges over the period from 2009 to 2019. We chose this observation period because we believe this spanning is relatively stable as it is after the financial crisis in 2007-2008 and before COVID-19. All of the data, including data regarding CEO departure, firm, and CEO characteristics, are obtained from the CSMAR database. We eliminated observations that have incomplete, abnormal data. We checked every CEO departure data to make sure that there was no abnormal data in the reasons for departure and CEO tenure. For the purpose of our study, we

eliminated observations whose CEO tenure is less than 12 months. This leaves a sample of 21,300 observations. We defined the industry categorization following the standard of the China Securities Regulatory Commission in 2001 and divided the manufacturing industry into subcategories.

4.2 Identification of Forced CEO Turnover

Though much of the prior literature follows the approach from Parrino (1997) that categorizes CEO turnover into forced and voluntary, Huson et al. (2004) emphasize that only forced turnover reflects the quality of monitoring. It is difficult to clarify forced and voluntary turnover as CEOs are rarely openly fired (Gibbons & Murphy, 1990). Prior literature that is based on the U.S. listed firms adopts the press news from the Wallstreet Journal, other exact turnover announcement data and age criteria, and further refinements (Parrino, 1997, 2014) to decide to clarify whether the turnover was voluntary or a forced one. For example, Huson et al. (2004) classify turnover as forced if the CEO leaves before age 60 and does not leave for other employment or health reasons or if the Wall Street Journal reports that the CEO was forced from the position. However, Lin and Su (2009) point out that using the age of 60 as a threshold is unsuitable in China because they find that about 94% of CEOs left the position before reaching the age of 60. We combine a practical approach from prior literature and the actual situation in the case of China; we use available data concerning CEO turnover from the CSMAR database in which the reasons for top management departure are categorized into twelve reasons. We classify the CEOs' departure as forced turnover if the reasons are none of the change of work assignment, retirement, health reasons, corporate governance reform, and involvement in litigation when CEOs below the age of 60.

4.3 Model Specification

Theoretically, there are two forms of implicit RPE usage tests according to the extent of which common risks are filtered out. The prediction of strong form is that peer performance is completely filtered from the evaluation of the CEO turnover decision (e.g., Bertrand & Mullainathan, 2001; Huson et al., 2001; Parrino, 2014; Weisbach, 1988), while the weak form holds that peer performance is only partially filtered out (e.g., Barro & Barro, 1990; Garvey & Milbourn, 2006; Gibbons & Murphy, 1990). In this section, we only focus on the weak-form RPE test, in which there is RPE usage evidence when peer performance is positive related to the CEO turnover. Keeping with the standard approach summarized by Fee et al. (2018) from prior literature, our regression model is as follows:

$$Prob(forced\ CEO\ turnover)_{i,t} = \beta_0 + \beta_1 Firm\ ROA_{i,t-1} + \beta_2 Peer\ ROA(Industry)_{i,t-1} + \sum Controls_{i.t} + YearDummy + \varepsilon_{i,t} \quad (1)$$

Where $forced\ CEO\ turnover_{i,t}$ is an indicator that equals one if CEO is younger than 60 years old and CEO turnover due to either of reason other than are none of change of work assignment, retirement, health reasons, corporate governance reform and involved in litigation in year t, but 0 otherwise. Following several prior work that based on Chinese listed firms, we adopt ROA as our financial performance measure. $Firm\ ROA_{i,t-1}$ is Firm ROA minus the median of industry ROA, where ROA is annual income before extraordinary items scaled by beginning assets in year t-1. $Peer\ ROA(Industry)_{i,t-1}$ is the equal-weighted annual income before extraordinary items scaled by beginning assets of the peer firms in the same industry, excluding the focal firm in year t-1. We also control for other factors that may affect the probability of forced CEO turnover. Firm size ($Firm\ Size_{i,t-1}$) is considered to capture multifaced characteristics that may affect the decision concerning dismiss the CEO and we measure is as the natural logarithm of the market value of common equity (million RMB) in year t-1. Besides, following Jenter and Kanaan (2015), we also control for CEO tenure and CEO age because these CEO personal characteristics may response CEOs' managerial power in the firms which may affect their likelihood of leaving. In addition, we include an indicator, SOEdummy, that equals one when firms are SOEs (the ultimate control owned by Chinese state or Chinese local government) in year t, but 0 otherwise. Because it is known that Chinese SOEs and private firms are quite distinct in many aspects. We include year fixed effects and compute z-statistics using robust standard errors clustered by industry.

To provide evidence for our hypothesis H1, we estimate the following logit model:

$$\begin{aligned} Prob(forced\ CEO\ turnover)_{i,t} &= \beta_0 + \beta_1 Firm\ ROA_{i,t-1} \\ &+ \beta_2 Peer\ ROA(Industry)_{i,t-1} + \beta_3 ExcessEmployment_{i,t-1} + \sum Controls_{i.t} \\ &+ YearDummy + \varepsilon_{i,t} \end{aligned} \quad (2)$$

The Equation (2) is based on Equation (1) and the only difference is that excess employment ($ExcessEmployment_{i,t-1}$) is included. Where $ExcessEmployment_{i,t-1}$ is a continuous variable capturing the extent to which a firm employs more employees than needs in year t-1. Following prior work (Fu & Sun, 2023; Johansson et al., 2017; Zeng & Chen, 2006), we adopt Equations (3), (4), and (5) to calculate the extent of excess employment. $\overline{Labor_{i,t}}$ is the optimal employment level, and

$Labor_{i,t}$ is the real employment level of firm *i* in year *t*. Excess employment is the difference between the extent of real labor and optimal labor, namely the residual of Equation (3), $\varepsilon_{i,t}$. $Labor_{i,t}$ is the number of employees per million RMB of total assets of firm *i* in year *t*, $Firm\ Size_{i,t}$ is the natural logarithm of total assets of firm *i* in year *t*, $Tangibility_{i,t}$ is the ratio representing fixed assets divided by total assets, $Growth_{i,t}$ is the growth of sales, a_{ind} is the industry fixed effect, a_t is the year fixed effect, and $\varepsilon_{i,t}$ is the error term of Equation (3). Therefore, the bigger $Excess\ Employment_{i,t}$ is, the bigger the difference between the real and optimal employment level is, further referring to the severe excess employment.

$$Labor_{i,t} = \beta_1 Firm\ Size_{i,t} + \beta_2 Tangibility_{i,t} + \beta_3 Growth_{i,t} + a_{ind} + a_t + \varepsilon_{i,t}\ , \quad (3)$$

$$\overline{Labor_{i,t}} = \beta_1 Firm\ Size_{i,t} + \beta_2 Tangibility_{i,t} + \beta_3 Growth_{i,t} + a_{ind} + a_t\ , \quad (4)$$

$$Excess\ Employment_{i,t} = Labor_{i,t} - \overline{Labor_{i,t}}\ . \quad (5)$$

5 Empirical Findings

5.1 Descriptive Statistics

Table 1 presents the frequency of CEO turnovers by fiscal year, including the number of firm-year observations, the number of CEO turnovers and Forced CEO turnovers, and the percentage of firm-years with Forced CEO turnovers. Notably, the frequency of forced CEO turnover has been increasing over the years, possibly indicating an enhancement in corporate governance quality. Additionally, this panel reveals that the average forced turnover rate for SOEs stands at 8.77%, and that of private firms record a slightly higher rate of 10.31%, indicating that SOEs are less likely to replace their CEOs compared to private firms. All variables are defined in Table 2.

[Insert Table 1 here]

[Insert Table 2 here]

Table 3 provides an overview of our sample. Panel A of Table 3 reports descriptive statistics by fiscal year, including firm-year observations, mean, standard deviation, and median values for all the variables used in our regressions. The dataset comprises 21,300 firm-year observations for the full sample, with 9,896 pertaining to SOEs and 11,404 to private firms. To emphasize the statistical differences between these two subsamples, we also provide mean differences using T-test with equal variance, except for the SOEdummy variable. The p-values underscore the significant differences

between these groups for each variable at least a 10% level, highlighting the importance of distinguishing between ownership types. Notably, private firms exhibit higher rates of forced CEO turnover, Firm ROA, and CEO tenure than their SOE peers, while SOEs display higher levels of excess employment, firm size, and elder CEO compared to private firms. Panel B of Table 3 reports descriptive statistics according to excess employment level. Firms are classified into the "Low excess employment subgroup" if their excess employment is below the median excess employment, and conversely for the "High" subgroup. The mean differences (T-test with equal variance) present a statistically significant difference between these two subgroups for all variables. Notice that the forced CEO turnover frequency from Low excess employment is lower than that from the High subgroup both in terms of mean and median levels, thus providing preliminary support for our hypothesis at a statistical level. Panel C of Table 3 reports the Pearson correlations between forced CEO turnover and other variables for the full sample. It reveals a significantly negative relationship between excess employment and the likelihood of forced CEO turnover at the p=0.01 level. Furthermore, the negative sign of the SOEdummy variable suggests that SOEs are statistically less likely to fire their CEOs than private firms.

[Insert Table 3 here]

5.2 Results for Baseline Regressions

5.2.1 Test for Weak-form RPE Usage in Forced CEO Turnover

Table 4 presents the results of estimating Equation (1) and Equation (2) for Full sample, SOEs, and Private firm subsamples, respectively. Columns (1), (3), and (5) present the basic RPE usage test results, while columns (2), (4), and (6) provide evidence concerning whether excess employment matters in the decision to force CEO turnover. We observe that, in each column, the one-year lagged Firm ROA shows a significantly negative relationship (at p=0.01 level) with the dependent variable, signifying that firms indeed terminate their CEOs in response to inferior firm-specific performance. This finding aligns with prior research conducted on Chinese listed firms, such as Liao et al. (2009), Kato and Long (2006) and Lin and Su (2009). However, when we observe the coefficients of equal-weighted industry ROA performance, inconsistent results arise. For the full sample and Private firm subsample, as shown in columns (1) and (5), a statistically significant and negative relationship between industry performance and forced CEO turnover is evident. In contrast, for the SOEs subsample, this relationship does not appear to exist. It is worth noting that the empirical p-value for equality of the industry performance, presented in bold font within column (5), indicates no statistically significant differences (p=0.1173) between SOEs and the private subsamples. Our results that bad industry performance increases the likelihood of a CEO turnover is contrary to what

RPE theory expected but similar to what several prior empirical work had found, such as Jenter and Kanaan (2015) , Fee et al. (2018) and (Barakova & Palvia, 2010).

5.2.2 Test for Hypothesis H1

Columns (2), (4), and (6) of Table 4 are designed to evaluate the validity of our hypothesis H1. Our hypothesis finds support in both the full sample and private firms' samples, as evidenced by columns (2) and (6), which display a significant negative coefficient for excess employment. However, while the excess employment negatively correlates with forced CEO turnover in SOEs, it does not reach statistical significance. This result aligns with the conclusions drawn by Liao et al. (2009), who did not find that excess employment is an independent influencing factor affecting the CEO turnover decision in Chinese SOEs. Additionally, the empirical p-values for equality of the industry performance ($p = 0.1190$) and excess employment ($p=0.1029$) for the two subsamples, separately, indicate that the differences are not significant in statistics. Notice that the strongly negative coefficient of the binary variable, SOEdummy. We speculate that SOEs may inherently have a lower likelihood of terminating their CEOs. In addition, the increased pseudo R-squared values, for example, rising from 0.02 to 0.0206 (an increase of approximately 3%) in the full sample, demonstrate that incorporating excess employment into the model enhances estimation efficiency. Moreover, by comparing the absolute values of coefficients on financial performance measures (Firm ROA and Industry ROA) and the non-financial performance measure (excess employment), we can conclude that financial performance still occupies the dominant position in determining whether a CEO is likely to be replaced or not. Regarding other control variables, although the coefficients vary across several columns, the general conclusion remains consistent: firms with larger scales, and CEOs with longer tenure and older age are less likely to be forced turnover.

[Insert Table 4 here]

5.2.3 Test for the Condition Effect of Excess Employment on Weak-form RPE Usage in Forced CEO Turnover

In Table 5, we present our results examining whether the usage of RPE varies across different levels of excess employment. We separate our data into Low and High excess employment subgroups based on a comparison with the median of excess employment by year. For each subgroup, we also generate subsamples for the full listed firms, SOEs, and Private subsamples. The coefficients of firm-specific ROA in each column exhibit a significant and negative relationship with forced CEO turnover. However, the coefficients of industry ROA differ markedly between the Low and High

excess employment subgroups. In the Low Excess employment subgroup, the industry ROA is significantly and negatively associated with the likelihood of forced CEO turnover for all subsamples. This result aligns with our findings for the full dataset and private firms but contradicts the results for the Chinese state-owned firm subsample in Table 4. Conversely, in the high excess employment subgroup, we observe that the coefficient of industry ROA in each subsample lacks a significant relationship with the dependent variable. This implies that firms with high levels of excess employment do not dismiss more CEOs in response to industry recession. We also provide empirical p-values for the coefficient differences between Low and High excess employment subgroups. The p-values ($p=0.0097$ and $p=0.0331$) between these two subgroups within the full sample and SOEs indicate a significant difference of at least 5%, while this is not the case for the Private Firm subsample. Our findings shed light on a puzzle raised by Jenter and Kanaan (2015), who identified three potential reasons why firms terminate more CEOs when their peers perform well. One of these explanations is that the boards mistakenly attribute or blame exogenous performance shocks to the CEO. Our research shows that boards of directors or the government in firms with high levels of excess employment rectify this error to some extent. Consequently, we offer a possible explanation for why prior studies have found a negative relationship between peer performance and CEO turnover. Researchers may have overlooked some key factors in their hypotheses that surrogate decision-makers might employ.

[Insert Table 5 here]

5.3 Robustness Check

5.3.1 Test for Strong-form RPE Usage by Two-stage Approach

In the baseline regressions, we have examined whether RPE is used in forced CEO turnover decisions, where weak-form RPE predicts that the likelihood of forced CEO turnover should be negatively related to firm performance and positively related to peer performance. The prediction of strong-form RPE is that peer performance is completely filtered from the evaluation of the CEO turnover decision (e.g., Bertrand & Mullainathan, 2001; Huson et al., 2001; Parrino, 2014; Weisbach, 1988). In this section, to robust our findings, we examine the strong-form RPE hypothesis where the relative performance should not have predictive power for the likelihood of forced CEO turnover. Following Jenter and Kanaan (2015) and Barakova and Palvia (2010), we also adopt the two-stage regression approach. The first stage decomposes firm performance into systematic components, namely the performance caused by industry performance and the firm-specific component, which mainly results from firm-own characteristics. In the second stage, we use the

estimated industry performance component and the estimated residual component of firm performance to predict the likelihood of forced CEO turnover using logit regression.

First stage:

$$\gamma_{i,t-1} = \beta_0 + \beta_1 * \gamma_{insustry\ performance,t-1} + \nu_{i,t-1} \quad (6)$$

Second stage:

$$Prob(forced\ CEO\ turnover)_{i,t} = \gamma_0 + \gamma_1 * \hat{r}_{i,t-1} + \gamma_2 * \hat{v}_{i,t-1} + Controls_{i,t} + \varepsilon_{i,t} \quad (7)$$

Where $\hat{r}_{i,t-1} = \hat{\beta}_0 + \hat{\beta}_1 * \gamma_{insustry\ performance,t-1}$.

$\hat{r}_{i,t-1}$ is the estimated exogenous component of firm performance that attributes to the industry performance and $\hat{v}_{i,t-1}$ is the estimated residual component of firm performance. The null hypothesis of strong form RPE is that the exogenous determined performance should not affect the likelihood of turnover and thus $\gamma_1 = 0$. The alternative hypothesis is that exogenous effects and idiosyncratic effects should have similar directions (i.e., $\gamma_2 < 0$). Table 6 presents results for RPE usage tests in columns (1), (3) and (5) for the full sample and two subsamples. The results show that bad exogenous performance significantly increases the likelihood of forced CEO turnover at least a p=0.05 level for full listed firms and private firms. Thus, the strong-form RPE is strongly rejected, supporting our conclusions from the baseline regressions. However, no significant coefficient of exogenous performance is present for the SOEs subsample. Besides, the p-value reported in the brackets in column (3) shows there is a statistical distinction between SOEs and Private Firms subsamples in the coefficient on $Exog\_Perf_{t-1}$ at 5 %. Further, we include $Excess\ Employment_{i,t-1}$ in the second stage to robust our Hypothesis H1 following Equation (8).

$$\begin{aligned} Prob(forced\ CEO\ turnover)_{i,t} \\ &= \gamma_0 + \gamma_1 * \hat{r}_{i,t-1} + \gamma_2 * \hat{v}_{i,t-1} + \gamma_3 * Excess\ Employment_{i,t-1} \\ &+ \sum Controls_{i,t} + YearDummy + \delta_{i,t} \end{aligned} \quad (8)$$

We find that the coefficients and significance of $Exog\_Perf_{t-1}$ for all samples are basically unchanged even if one-year lagged excess employment is added in. The coefficient of $Excess\ Employment_{i,t-1}$ is significantly negatively related to the likelihood of forced CEO turnover in the full and Private Firm subsample, but not in the SOEs subsample. This is consistent

with our results in baseline regressions and thus again robust to our Hypothesis H1. Importantly, the p-value of the difference between these two subsamples in the coefficient of $Excess\ Employment_{i,t-1}$, is significant at p=0.1 level, and thus substantiates our findings of baseline regressions.

[Insert Table 6 here]

5.3.2 Two-stage Probit Regressions of Forced CEO Turnover on Excess Employment

While we assume that excess employment is exogenous to forced CEO turnover decisions, it is still plausible that both may be endogenously influenced by certain unobservable factors, potentially compromising the robustness of our main regression findings. Additionally, there exists a potential for reverse causality between the likelihood of forced CEO turnover and excess employment. For instance, a CEO might enhance social responsibility and corporate image by hiring more employees than necessary, thereby diminishing the probability of facing dismissal. To fortify the robustness of our evidence, we employ the two-step approach proposed by Newey (1987). The first instrumental variable is the natural logarithm of the number of employees ($Ln\ Employee_{t-1}$), correlated with the level of excess employment yet less likely to be associated with unobservable variables influencing the likelihood of forced CEO turnover. The second instrumental variable is the unemployment rate in the province where the firm is located ($Unemployment\ Rate_{t-1}$). Given that the employment rate is a crucial metric for the central government in evaluating the performance of local government officials, the unemployment rate could reflect the evaluation pressure on these officials. Simultaneously, elevating the employment rate relies on local firms hiring more employees. Therefore, we contend that in provinces with high unemployment rates, the extent of excess employment in local firms will likely be lower. However, it is less likely that the province-based unemployment rate directly impacts on the firm-level forced CEO turnover likelihood. Hence, we consider the province-based unemployment rate to be a valid instrument.

Table 7 shows the results of Newey's two-stage regressions, where the endogenous variable, Excess employment, is instrumented. The first-stage regression is conducted with two instrument variables in the form of $Ln\ Employee_{t-1}$ and $Unemployment\ Rate_{t-1}$ using OLS. The second-stage regression follows Equation (2) using the probit approach. In the first-stage estimation, $Ln\ Employee_{t-1}$ takes on a positive and significant coefficient, consistent with a firm having a high extent of excess employment if its level of employees is larger. The coefficient on $Unemployment\ Rate_{t-1}$ is significantly negative for full and private subsample, respectively. This

is consistent with our assumption that the extent of excess employment of a firm is negatively related to the province unemployment rate where the firm is located. In contrast, this coefficient is insignificantly positive for the SOEs subsample. The validity of our instrument variables is supported by the adjusted R^2 ranging from 0.384 to 0.514. The AR statistic and Wald statistic range from 5.55 to 25.76 and 4.69 to 25.69, respectively, and are statistically significant at least at the p=10% level. Both of them support that the models are not subject to weak instrument problems. In addition, the insignificant Amemiya-Lee-Newey minimum chi-square statistic suggests that our instruments are exogenous and uncorrelated with the error terms. In the second stage regressions, we find significant and negative coefficient estimates for the likelihood of forced CEO turnover negative for all samples, consistent with our assumption in Hypothesis H1 and the findings that we have concluded in our baseline regressions partially. Notice that in the baseline regressions, we do not find there is a significantly negative relationship between excess employment and forced CEO turnover. Therefore, we may conclude that the results from baseline regressions for SOEs may be affected by the endogenous issues.

[Insert Table 7 here]

5.3.3 Entropy Balancing Technique Using Linear Probability Model

To enhance the robustness of our main findings, we also replicate our baseline regressions using a linear probability model suggested by Fee 2018. However, instead of using the continuous variable, excess employment, we generate and use a binary variable, High Excess Employment, which equals one if the excess employment exceeds the median and 0 otherwise. Moreover, to mitigate the potential endogeneity problem, we adopt the Entropy Balancing technique (Hainmueller, 2012). This sample selection technique can match the covariates across the treatment and control groups but with fewer restrictions or data dropping. The Entropy Balancing technique can balance the covariate distributions of the treatment and control groups across mean, variance, and skewness. Due to the algorithm convergence issue of our data, we only match the treatment and control groups across mean and variance levels and rerun the baseline analysis using the matched sample with year and industry-fixed effects. Table 8 illustrates that the high excess employment has a significantly positive relationship with the likelihood of forced CEO turnover for the full sample and private subsample. At the same time, this is not the case for SOEs., which is relatively consistent with our findings from baseline regressions.

[Insert Table 8 here]

5.3.4 Test for the Condition Effect of Excess Employment by Quartile Distribution

To test whether our results from the baseline regression that the estimated coefficients on RPE usage change due to varying degrees of excess employment are robust, we further categorize the Excess employment into quartiles and retest Equation (1). Our object is to confirm that the significantly distinct coefficients of peer performance between relatively high and low excess employment subgroups do not result from the subjective definition of the threshold level, naming whether the excess employment is over the median. Table 9 presents the results using this method. The coefficients of the one-year lagged Peer ROA(Industry) are all significant and negatively related to the likelihood of forced CEO turnover for full and private subsamples in the three subsamples under the 75^{th} percentiles. However, this only exists in the subgroup between the 25^{th} and 50^{th} subgroup for the SOEs subsample. Notice that for the subgroup that excess employment exceeds the third quartile, the one-year lagged Peer ROA (Industry) coefficients are no more significant for the three subsamples. Besides, the empirical p values show that the coefficients of one-year lagged Peer ROA (Industry) are significant differences between subgroups that are below 25^{th} and over 75^{th} for the full sample (p=0.0013) and private subsample (p=0.0054). These findings are similar to the results from the baseline regressions that firms with high excess employment would not fire their CEO due to the industry recession.

[Insert Table 9 here]

6 Conclusion

The objective of our study is to examine whether RPE is used on forced CEO turnover decisions and whether excess employment affects RPE usage in the context of China. Using a sample of Chinese listed firms over the period of 2009-2019, we obtained three original findings. First, we observe a significant negative correlation between peer performance and the likelihood of forced CEO turnover, and thus, there is no evidence of RPE usage. Second, we find that firms with higher levels of excess employment are less likely to fire their CEOs. Nevertheless, it is essential to note that the influence of excess employment on forced CEO turnover is notably weaker than that of a firm's financial performance and peer performance. Third, we identify that the impact of peer performance on forced CEO turnover varies depending on the extent of excess employment. The negative relationship between peer performance and forced CEO turnover merely arises in the low excess employment subgroup. The robustness tests, such as strong-form RPE tests, Two-stage IV Probit method, and Entropy Balancing technique with linear regressions, consolidate these findings.

Our study contributes to the literature in the following ways. First, we undertake an analysis of the comparable effects of RPE theory and NFPMs in addressing agency issues. Our findings highlight the competitive relationship between these two theories and their influence on the implementation of RPE in decisions related to forced CEOs turnover. This finding shed light on the puzzling question of why NFPMs are rarely incorporated into RPE contracts. Second, we emphasize the essential impact of social performance on CEO turnover literature and provide compelling empirical evidence about the application of RPE usage in forced CEO turnover within Chinese listed firms. Finally, our study illuminates that the negative relationship between peer performance and forced CEO turnover merely arises in the low excess employment group, thus providing substantiating evidence for the ongoing discussion concerning "why more CEOs are fired when their peer group is not doing well" from Jenter and Kanaan (2015).

It should be noted that there are certain constraints in our study. First, our analysis has examined the direct effects of excess employment and the financial performance of both firms and peers on the likelihood of forced CEO turnover, without accounting for potential correlations between these factors. For example, prior work has suggested that excess employment may lead to inferior firm performance, and others stated that the state/government provides other benefits for firms, such as government subsidies, low-interest loans, and policy preferences, which ultimately cause firms' value-enhancing. Future research could explore the indirect causation between excess employment and firm/peer financial performance for deeper understanding. Another possible method could involve deriving peer performance based on the extent of excess employment and assessing whether the peer performance is in line with the assumption of RPE theory. Second, as mentioned, excess employment may reflect multifaceted factors such as firms' management strategy, financial condition, firm performance, risk, or firm organization in addition to the social performance and non-financial performance as in this study. Therefore, interesting research directions may be reached by taking excess employment from other aspects into consideration. Third, the definition of forced CEO turnover is inevitably subject to our subjective judgment. We have not tested whether our findings hold when adopting alternative CEO turnover definitions, such as voluntary turnover or total turnover. Finally, while the State-owned Assets Supervision and Administration Commission of China has explicitly included social responsibilities undertaken by SOEs in the performance assessment, our study did not find substantial evidence indicating that excess employment significantly impacts the forced CEO replacement in SOEs. We speculate that this could be due to CEOs in high-excess employment firms being more likely to be promoted to other official departments, whereas our study primarily focuses on CEO dismissals. Moreover, the impact of excess employment on CEO turnover may vary between local government-owned SOEs and central

state-owned SOEs (Wu et al., 2012). Future research may yield greater insights by observing CEO roles post-departure and distinguishing between different types of SOEs.

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Table 1

Frequency of Forced CEO Turnovers by Fiscal Year.

	Full				SOEs				Private			
Year	Number of Firm-Years	Number of CEO turnovers	Number of Forced CEO turnovers	Percentage of Firm-Years with Forced CEO turnovers	Number of Firm-Years	Number of CEO turnovers	Number of Forced CEO turnovers	Percentage of Firm-Years with Forced CEO turnovers	Number of Firm-Years	Number of CEO turnovers	Number of Forced CEO turnovers	Percentage of Firm-Years with Forced CEO turnovers
2009	1,450	271	112	7.72%	878	183	77	8.77%	572	88	35	6.12%
2010	1,506	266	126	8.37%	882	156	72	8.16%	624	110	54	8.65%
2011	1,712	311	154	9.00%	904	181	78	8.63%	808	130	76	9.41%
2012	1,873	291	151	8.06%	908	143	67	7.38%	965	148	84	8.70%
2013	1,947	349	178	9.14%	924	192	84	9.09%	1,023	157	94	9.19%
2014	1,960	379	194	9.90%	910	191	79	8.68%	1,050	188	115	10.95%
2015	2,017	434	225	11.06%	898	210	84	9.35%	1,119	224	141	12.60%
2016	2,106	449	237	11.25%	889	223	85	9.56%	1,217	226	152	12.41%
2017	2,228	435	219	9.83%	898	215	86	9.58%	1,330	220	133	10.00%
2018	2,265	442	201	8.87%	893	220	77	8.62%	1,372	222	124	9.04%
2019	2,236	467	247	11.05%	912	223	79	8.66%	1,324	244	168	12.69%
Total	21300	4094	2044	9.60%	9896	2137	868	8.77%	11404	1957	1176	10.31%

This table presents yearly distribution including the number of observations and the fuequency of forced CEO turnovers for Chinese listed firms spanning from 2009 to 2019 by owernship. Full presents all Chinese listed firms including SOEs and Private subsamples. SOEs and Private reprenst state-owned enterprise and private firms,respectively.

Table 2

Variable Definitions.

Variables	**Definition**
Forced CEO turnover $_{t}$	An indicator that equals one if ① CEO is younger than 60 years old and ② CEO turnover due to either of reason other than are none of change of work assignment, retirement, health reason, corporate governance reform and involved in litigation in year t, but 0 otherwise. For all of the observations that CEO tenure is over 12 months.
Firm ROA $_{t-1}$	Firm ROA minus the median of industry ROA, where ROA is annual income before extraordinary items scaled by beginning assets in year t-1.
Peer ROA(Industry) $_{t-1}$	The equal-weighted annual income before extraordinary items scaled by beginning assets of the peer firms in the same industry, excluding the focal firm in year t-1.
Excess Employment $_{t-1}$	Excess employment calculated following Equation (3) (4) and (5) in year t-1.
Firm Size $_{t-1}$	Natural logarithm of the market value of common equity (million RMB) in year t-1.
CEO tenure(months) $_{t}$	The CEO's on-the-job months in year t.
CEO Age $_{t}$	The age of the CEO in year t, .
SOEdummy $_{t}$	An indicator that equals one if the ultimate control of the firm is Chinese state or Chinese local government in year t, but 0 otherwise.

Table 3

Summary Statistics

Panel A: Descriptive Statistics by Ownership.

	Full (N=21300)			SOEs (N=9896)			Private (N=11404)			MeanDiff	
	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median	(Private-SOEs)	p-Value
Forced CEO turnover $_{t}$	0.096	0.295	0.000	0.088	0.283	0.000	0.103	0.304	0.000	0.015	0.000***
Firm ROA $_{t-1}$	-0.002	0.068	-0.000	-0.005	0.058	-0.004	0.001	0.075	0.003	0.006	0.000***
Peer ROA(Industry) $_{t-1}$	0.033	0.010	0.031	0.034	0.011	0.033	0.033	0.010	0.031	-0.001	0.000***
Excess Employment $_{t-1}$	-0.010	0.597	-0.117	-0.001	0.564	-0.090	-0.017	0.625	-0.141	-0.016	0.050*
Firm Size $_{t-1}$	8.451	1.354	8.305	8.844	1.427	8.689	8.110	1.186	8.034	-0.733	0.000***
CEO tenure(months) $_{t}$	57.203	37.633	47.000	54.579	36.543	44.000	59.479	38.410	50.000	4.901	0.000***
CEO Age $_{t}$	49.910	7.375	50.000	50.540	5.524	51.000	49.363	8.630	49.000	-1.177	0.000***
SOEdummy $_{t}$	0.465	0.499	0.000								

Panel B: Descriptive Statistics by Excess Employment.

	Low_EE subgroup (N=10723)		High_EE subgroup (N=10577)			
	Mean	Median	Mean	Median	MeanDiff	p-Value
Forced CEO turnover $_{t}$	0.104	0.000	0.088	0.000	0.016	0.000***
Firm ROA $_{t-1}$	-0.006	-0.004	0.002	0.002	-0.008	0.000***
Peer ROA(Industry) $_{t-1}$	0.033	0.031	0.033	0.031	0.000	0.068*
Excess Employment $_{t-1}$	-0.410	-0.372	0.396	0.200	-0.806	0.000***
Firm Size $_{t-1}$	8.319	8.218	8.585	8.401	-0.265	0.000***
CEO tenure(months) $_{t}$	56.226	46.000	58.192	48.000	-1.966	0.000***
CEO Age $_{t}$	49.755	50.000	50.067	50.000	-0.312	0.002***
SOEdummy $_{t}$	0.436	0.000	0.493	0.000	-0.057	0.000***

Panel C: Pearson Correlations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Forced CEO Turnover $_{t}$	1.000							
Firm ROA $_{t-1}$	-0.0900*	1.000						
Peer ROA(Industry) $_{t-1}$	-0.0285*	0.0011	1.000					
Excess Employment $_{t-1}$	-0.0205*	0.0167*	0.0221*	1.000				
Firm Size $_{t-1}$	-0.0164*	0.1103*	-0.0957*	-0.0046	1.000			
CEO tenure(months) $_{t}$	-0.0447*	0.0611*	-0.0113	0.0089	0.0529*	1.000		
CEO Age $_{t}$	-0.0307*	0.0248*	-0.0281*	0.0247*	0.1146*	0.2164*	1.000	
soedummy $_{t}$	-0.0261*	-0.0780*	0.0208*	0.0017	0.2702*	-0.0650*	0.0796*	1.000

Panel A presents descriptive statistics by ownership. SOEs and Private represent state-owned enterprises and non-state-owned enterprises, repectively. ***, ** and * indicate significant difference between the SOEs and Private subgroups at the 1%, 5% and 10% levels, separately (two-tailed).

Panel B presents descriptive statistics by excess employment. Firms are included in High_EE subgroup if their excess employment exceed the median in year t and Low_EE subgroup is the complement set of High_EE subgroup. ***, ** and * significant difference between the SOEs and Private subgroups at the 1%, 5% and 10% levels, separately (two-tailed).

Panel C reports the Pearson correlations of the dependent variable and independent variables used in forced CEO turnover tests.

All variables are defined in Table 2. All variables but dummy variables are winsorized at the 1% and 99% levels. * indicate significance at the 5% level, based on a two tailed t-test .

Table 4

Test for Weak-form RPE Usage and Hypothesis H1.

Variables	Dependent=Prob(Forced CEO turnover$_t$)					
	(1)	(2)	(3)	(4)	(5)	(6)
	Full		SOEs		Private	
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
Firm ROA $_{t-1}$	-3.655***	-3.659***	-3.206***	-3.217***	-3.892***	-3.878***
	(-10.75)	(-10.77)	(-6.43)	(-6.40)	(-6.90)	(-6.91)
Peer ROA(Industry) $_{t-1}$	-7.827***	-7.774***	-3.110	-3.075	-13.790***	-13.690***
	(-2.67)	(-2.60)	(-0.96)	(-0.94)	(-2.77)	(-2.75)
					[0.1173]	**[0.1190]**
Excess Employment $_{t-1}$		-0.107**		-0.032		-0.155**
		(-2.12)		(-0.50)		(-2.49)
						[0.1029]
Firm Size $_{t-1}$	-0.045**	-0.045**	-0.059**	-0.060*	-0.026	-0.025
	(-2.24)	(-2.29)	(-1.99)	(-1.96)	(-0.67)	(-0.66)
CEO tenure(months) $_t$	-0.004***	-0.004***	-0.000	-0.000	-0.006***	-0.006***
	(-7.67)	(-7.42)	(-0.17)	(-0.17)	(-6.84)	(-6.89)
CEO Age $_t$	-0.012***	-0.012***	-0.011	-0.011	-0.012**	-0.012**
	(-3.02)	(-2.86)	(-1.64)	(-1.60)	(-2.50)	(-2.29)
SOEdummy $_t$	-0.146**	-0.144**				
	(-2.47)	(-2.35)				
Constant	-1.124***	-1.147***	-1.297***	-1.302***	-1.352**	-1.400**
	(-3.41)	(-3.58)	(-3.40)	(-3.42)	(-2.24)	(-2.38)
Year FE	YES	YES	YES	YES	YES	YES
Obs.	21,300	21,300	9,896	9,896	11,404	11,404
Pseudo R-Squared	0.020	0.021	0.009	0.009	0.032	0.034

This table presents regression results of the RPE usage and the impact of excess employment on forced CEO turnover decision. The variables are defined in Table 2. All variables but dummy variables are winsorized at the 1% and 99% levels. The numbers reported in the parentheses are z-statistics clustered by industry. The p-value of the difference between SOEs and Private subsamples in the coefficient of Peer ROA(Industry) $_{t-1}$ and Excess Employment $_{t-1}$ reported in the brackets with Bold font. ***, ** and * indicate significance at the 1%, 5% and 10% levels, separately (two-tailed).

Table 5

Test for the Condition Effect of Excess Employment on Weak-form RPE Usage in Forced CEO Turnover.

Variables	Dependent=Prob(Forced CEO turnover$_t$)					
	(1)	(2)	(3)	(4)	(5)	(6)
	Low_EE subgroup			High_EE subgroup		
	Full	SOEs	Private	Full	SOEs	Private
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
Firm ROA $_{t-1}$	-3.681***	-3.366***	-3.898***	-3.591***	-3.048***	-3.855***
	(-8.16)	(-4.91)	(-5.39)	(-6.88)	(-5.72)	(-5.18)
Peer ROA(Industry) $_{t-1}$	-13.433***	-8.906**	-17.358***	-2.748	0.318	-8.827
	(-4.44)	(-1.96)	(-3.35)	(-0.67)	(0.11)	(-1.20)
				[0.0097]	**[0.0331]**	**[0.2585]**
Firm Size $_{t-1}$	-0.054*	-0.070	-0.037	-0.021	-0.039	0.005
	(-1.88)	(-1.30)	(-1.03)	(-0.68)	(-1.01)	(0.08)
CEO tenure(months) $_t$	-0.005***	-0.001	-0.007***	-0.003***	0.000	-0.006***
	(-9.72)	(-0.44)	(-5.51)	(-4.11)	(0.27)	(-6.08)
CEO Age $_t$	-0.009**	-0.005	-0.009	-0.017***	-0.016	-0.016***
	(-2.14)	(-0.84)	(-1.60)	(-2.81)	(-1.30)	(-2.77)
SOEdummy $_t$	-0.181**			-0.094		
	(-2.07)			(-1.45)		
Constant	-0.896***	-1.406***	-0.800	-1.439***	-1.223**	-2.414***
	(-3.22)	(-3.01)	(-1.39)	(-2.80)	(-2.22)	(-2.95)
Year FE	YES	YES	YES	YES	YES	YES
Obs.	10,723	4,680	6,043	10,577	5,216	5,361
Pseudo R-Squared	0.025	0.014	0.035	0.016	0.011	0.033

This table presents regression results of the condition effect of excess employment on weak-form RPE usage in forced CEO turnover.The variables are defined in Table 2. All variables but dummy variables are winsorized at the 1% and 99% levels. The numbers reported in the parentheses are z-statistics clustered by industry. The p-value of the difference between Low EE_subgroup and High EE_subgroup for Full, SOEs and Private subsamples in the coefficient of Peer ROA(Industry) $_{t-1}$ reported in the brackets with Bold font, respectively. ***, ** and * indicate significant difference between the two subsamples at the 1%, 5% and 10% levels, separately (two-tailed).

Table 6

Test for Strong-form RPE Usage by Two-stage Approach.

Dependent	Firm ROA $_{t-1}$	Prob(Forced CEO turnover$_t$)					
	1st stage(OLS)	2nd stage(Logit)					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Full	Full		SOEs		Private	
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
Peer ROA(Industry) $_{t-1}$	0.972***						
	(22.74)						
Idisyncratic_Perf $_{t-1}$		-2.591***	-2.576***	-2.019***	-2.019***	-2.934***	-2.909***
		(-6.25)	(-6.36)	(-3.91)	(-3.92)	(-5.04)	(-5.09)
Exog_Perf $_{t-1}$		-7.243**	-7.122**	-1.463	-1.432	-15.628***	-15.447***
		(-2.04)	(-1.97)	(-0.43)	(-0.41)	(-3.46)	(-3.42)
						[0.0155]	[0.0164]
Excess Employment $_{t-1}$			-0.090*		-0.015		-0.140**
			(-1.74)		(-0.22)		(-2.43)
							[0.0650]
Firm Size $_{t-1}$		-0.062***	-0.063***	-0.067**	-0.068**	-0.054	-0.053
		(-3.26)	(-3.28)	(-2.38)	(-2.33)	(-1.44)	(-1.46)
CEO tenure(months) $_t$		-0.004***	-0.004***	-0.001	-0.001	-0.007***	-0.007***
		(-7.78)	(-7.56)	(-0.31)	(-0.31)	(-7.26)	(-7.29)
CEO Age $_t$		-0.012***	-0.012***	-0.011*	-0.011*	-0.012***	-0.011***
		(-3.67)	(-3.43)	(-1.69)	(-1.66)	(-3.07)	(-2.76)
SOEdummy $_t$		-0.164**	-0.163**				
		(-2.58)	(-2.48)				
Constant	-0.006***	-0.866***	-0.889***	-1.202***	-1.204***	-0.886	-0.938
	(-2.77)	(-2.86)	(-2.94)	(-3.37)	(-3.36)	(-1.46)	(-1.57)
Year FE	NO	YES	YES	YES	YES	YES	YES
Obs.	21,300	21,300	21,300	9,896	9,896	11,404	11,404
Adjusted R-squared	0.032						
Pseudo R-Squared		0.016	0.016	0.005	0.005	0.029	0.030

This table presents the results for the two-stage logit regressions of Forced CEO turnover on firm and industry performance. The first stage regression use industry return on assets to predict contemporaneous firm return on assets with Peer ROA(Industry) $_{t-1}$ as the instrument. The second-stage predict forced CEO turnover using the predicted values and the residuals from the first-stage regression as measures of the Exog_Perf $_{t-1}$, and the Idisyncratic_Perf $_{t-1}$, respectively. The dependent variable in the second-stage regression is the probability of forced CEO turnover. The other variables are defined in Table 2. All variables but dummy variables are winsorized at the 1% and 99% levels. The numbers reported in the parentheses in column (1) is the t-statistics , reported in the parenthese from column (2) to column (7) are z-statistics clustered by industry. The p-value of the difference between SOEs and Private subsamples in the coefficient of Exog_Perf $_{t-1}$ and Excess Employment $_{t-1}$ reported in the brackets with Bold font, respectively. ***, ** and * indicate significant difference between the two subsamples at the 1%, 5% and 10% levels, separately (two-tailed).

Table 7

Two-stage Probit regressions of Forced CEO Turnover on Excess Employment.

Dependent	Excess Employment $_{t-1}$ 1st stage(OLS)	Prob(Forced CEO turnover$_t$) 2nd stage(Probit)	Excess Employment $_{t-1}$ 1st stage(OLS)	Prob(Forced CEO turnover$_t$) 2nd stage(Probit)	Excess Employment $_{t-1}$ 1st stage(OLS)	Prob(Forced CEO turnover$_t$) 2nd stage(Probit)
	(1)	(2)	(3)	(4)	(5)	(6)
	Full		SOEs		Private	
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
Ln Employee $_{t-1}$	0.439***		0.370***		0.508***	
	(131.10)		(77.95)		(109.03)	
Unemployment Rate $_{t-1}$	-0.013***		0.008		-0.034***	
	(-3.07)		(1.29)		(-5.48)	
ExcessEmployment $_{t-1}$		-0.140***		-0.103**		-0.159***
		(-5.07)		(-2.17)		(-4.79)
Firm ROA $_{t-1}$	-0.034	-1.948***	-0.053	-1.675***	-0.142**	-2.101***
	(-0.66)	(-11.47)	(-0.64)	(-5.89)	(-2.20)	(-9.82)
Peer ROA(Industry) $_{t-1}$	-4.667***	-3.327***	-3.054***	-1.206	-6.618***	-6.379***
	(-14.56)	(-2.75)	(-7.37)	(-0.77)	(-13.28)	(-3.41)
Control variables	YES	YES	YES	YES	YES	YES
Constant	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Obs.	21,300	21,300	9,896	9,896	11,404	11,404
Adj. R-Squared	0.448		0.384		0.514	
Test for weak identification						
AR statistic		25.76***		5.55*		23.41***
Wald statistic		25.69***		4.69**		22.96***
Test of overidentification						
Amemiya-Lee-Newey minimum chi-sq statistic		0.018		0.847		0.402

This table presents the results for the two-stage probit regressions with Ln Employee t-1 and Unemployment Rate $_{t-1}$as the instrument variables. ExcessEmployment t-1 is the dependent variable in the first-stage regressions. The dependent variable in the second-stage regression is the probability of forced CEO turnover. Ln Employee t-1 means the natural logarithm of number of employees of firm in year t-1 and Unemployment Rate $_{t-1}$ is the unemployment rate in the province where the firm t is located. The variables are defined in Table 2. All variables but dummy variables are winsorized at the 1% and 99% levels. The numbers reported in the parentheses for the first stage are the t-statistics , reported in the parentheses for the second stage are z-statistics clustered by industry, respectively. ***, ** and * indicate significant difference between the two subsamples at the 1%, 5% and 10% levels, separately.

Table 8

Entropy Balancing Technique Using Linear Probability Model.

Variables	Dependent variable: Prob(Forced CEO turnover$_t$)					
	Before entropy balancing			After entropy balancing		
	(1)	(2)	(3)	(4)	(5)	(6)
	Full	SOEs	Private	Full	SOEs	Private
High_EE dummy $_{t-1}$	-0.011***	-0.006	-0.014**	-0.012***	-0.008	-0.014***
	(-2.72)	(-1.08)	(-2.53)	(-2.92)	(-1.35)	(-2.59)
Controls	YES	YES	YES	YES	YES	YES
Constant	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Obs.	21,300	9,896	11,404	21,300	9,896	11,404
Adj. R-Squared	0.015	0.006	0.025	0.013	0.006	0.024

This table reports the regression results for the impact of the High Excess Employment on likelihood of forced CEO turnover after entropy balancing the sample using the ordinary least squares (OLS). The variables are defined in Table 2. All variables but dummy variables are winsorized at the 1% and 99% levels. The numbers reported in the parentheses are t-statistics. Industry and year-fixed effects are included in the regression estimations. ***, ** and * indicate significance at the 1%, 5% and 10% levels, separately (two-tailed).

Table 9

Test for the Condition Effect of Excess Employment by Quartile Distribution.

Variables	Dependent=Prob(Forced CEO turnover$_t$)											
	Quartile distribution of Excess Employment $_{t-1}$											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Below 25th			25th-50th			50th-75th			Over 75th		
	Full Coefficient	SOEs Coefficient	Private Coefficient	Full Coefficient	SOEs Coefficient	Private Coefficient	Full Coefficient	SOEs Coefficient	Private Coefficient	Full Coefficient	SOEs Coefficient	Private Coefficient
Firm ROA $_{t-1}$	-3.473***	-4.042***	-3.214***	-3.627***	-1.478**	-4.978***	-3.418***	-3.351***	-3.299***	-3.792***	-3.215***	-4.222***
	(-8.12)	(-4.91)	(-4.86)	(-5.46)	(-2.36)	(-4.51)	(-7.01)	(-4.10)	(-5.36)	(-6.38)	(-5.04)	(-4.63)
Peer ROA(Industry) $_{t-1}$	-10.266***	-3.891	-16.849***	-13.896**	-14.487*	-14.023*	-15.806***	-4.722	-33.630***	4.638	1.900	6.894
	(-3.25)	(-1.15)	(-2.77)	(-2.53)	(-1.74)	(-1.78)	(-2.81)	(-0.86)	(-4.15)	(1.35)	(0.65)	(1.18)
p-value for equality between [Below 25th] and [Over 75th]										**[0.0013]**	**[0.1945]**	**[0.0054]**
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	5,325	2,155	3,170	5,325	2,562	2,763	5,325	2,678	2,647	5,325	2,501	2,824
Pseudo R-Squared	0.031	0.024	0.036	0.023	0.015	0.043	0.017	0.013	0.036	0.022	0.016	0.048

This table presents regression results of the condition effect of excess employment (by quartile) on weak-form RPE usage in forced CEO turnover.The variables are defined in Table 2. All variables but dummy variables are winsorized at the 1% and 99% levels. The numbers reported in the parentheses are z-statistics clustered by industry. The p-value of the difference between [Below 25th] and [Over 75th] subgroups in the coefficient of Peer ROA(Industry) t-1 for full ,SOEs and Private subsamples reported in the brackets with Bold font, respectively. ***, ** and * indicate significant difference between the two subsamples at the 1%, 5% and 10% levels, separately (two-tailed).