Corporate Accountability: Examining the Impact of CEO Pay Regulation on Corruption in China's State-Owned Enterprises

Abstract

This study delves into the influence of Chinese government regulations on CEO compensation and its role in corporate corruption, focusing on China's state-owned enterprises (SOEs). Employing the difference-in-differences (DiD) methodology, our research offers compelling evidence that CEO pay regulations significantly contribute to the reduction of corporate corruption. Notably, this impact is more pronounced in Central SOEs compared to Local SOEs counterparts. Moreover, we identify that the firm internal control as the underlying economic channels through which CEO pay regulations impede corporate corruption. The DiD result are validated through Parallel Trend Assumption, Propensity Score Matching and Placebo test. Additionally, the robustness of our results is confirmed by consistent outcomes when using alternative variables for CEO pay restriction measurement. This study underscores the synergistic role of government regulations in promoting corporate integrity and provides valuable insights into the intricate relationship between CEO compensation regulation and corporate corruption in Chinese business.

Keyword: Government Regulation, CEO Pay Restriction, Corporate Corruption**,** Types of State-Owned Enterprises

1 Introduction

In the realm of CEO (chief executive officer) compensation regulation in China, the focus has often revolved around environmental, social, financial, and performance-related aspects (Bai et al., 2019; Li, Maqsood, Zahid, et al., 2023; Su et al., 2020). However, a shift in focus is occurring, turning attention towards the impact of CEO pay regulations on corporate corruption (CCR). This shift is crucial as corruption remains a significant issue, especially within state-owned enterprises (SOEs), where executives' substantial authority lead to misuse of power and resources for personal gain (Hu et al., 2023).

Studies have highlighted the significant authority wielded by executives, potentially leading to opportunistic behavior (Jiang & Kim, 2020) and misuse of corporate resources like entertainment and travel expenses (Jaggi et al., 2021; Liu, 2016; Pearce et al., 2008). Specifically, in SOEs where the discretion in CEO decision-making related to firm performance and economic activities presents opportunities for corruption (Jin et al., 2022).

Interestingly, while CEO pay incentives, especially tournament-based structures, have been linked to heightened levels of CCR (Wang & Zheng, 2020). Their findings indicate that tournament-based incentives promote unethical cultures, corporate misconduct, weaken the power of lower-level employees, and subsequently increase instances of CCR. However, it is important to note that participating in a tournament doesn't automatically mean a firm will engage in wrongdoing. Subjective measures, like tournament outcomes, might not accurately reflect CEO performance or its relationship with corrupt practices. Nevertheless, a significant challenge in assessing the direct causal relationship between CEO pay and corruption arises when using the "grand prix" as the criterion for determining tournament winners. Several factors contribute to this challenge. Firstly, relying on the grand prix as a determinant introduces the possibility of confounding variables. This

means that there may be other factors or variables influencing both CEO pay and corruption charges, making it difficult to isolate and attribute the causal impact solely to CEO pay. Moreover, using a subjective measure like the grand prix to decide tournament winners may not provide a precise or objective way to evaluate CEO performance or its relationship with CCR.

Recognizing the challenges and the negative impact of corruption on long-term development, the Chinese government has implemented stricter CEO pay regulations in 2014. This regulatory change forms the crux of an ongoing study, aiming to assess the impact of these regulations on CEO compensation and their potential effect on CCR within a controlled setting.

The study stands out for not only examining the relationship between CEO compensation regulations and corruption but also investigating the mechanisms through which these regulations might influence CEO conduct in the realm of corruption. By doing so, it aspires to contribute significantly to the existing literature by providing a more controlled examination of how government regulations regarding CEO pay might intersect with and potentially reduce instances of corporate corruption within SOEs. The ultimate goal is to gain insights that can assist in crafting more effective regulatory frameworks, thereby reducing corruption and fostering a more ethical and transparent corporate environment within China's state-owned enterprises.

We have selected China as the focal point for our research for several compelling reasons. To begin with, the Chinese government initiated a series of measures aimed at promoting pay equality and implementing regulations related to CEO compensation (Jiang & Zhang, 2018; Li, Maqsood, & Zahid, 2023; Li, Sahil, et al., 2023; Su et al., 2020). Further, to gauge CCR, we analyze the Chinese corporate expenditures on entertainment and travel expenses. Building on the research of Cai et al. (2011), CCR comprises two key elements. The first element involves "greasing money," where managers engage in bribery to secure favorable treatment from influential individuals. The second

element relates to "managerial excess," where managers exploit company resources for personal gain. Our use of CCR as a metric aligns with existing scholarly literature and government reports (Agarwal et al., 2020; Fang et al., 2018; Giannetti et al., 2021; Kong & Qin, 2021). Consequently, our study aims to establish an experimental framework to investigate the impact of pay regulation on CCR. Additionally, we delve into the institutional aspect, particularly exploring the influence of CEO incentives as discussed by Wang and Zheng (2020) on fostering a corrupt environment. To achieve this, we assess the connection between pay regulation policies and CCR, specifically focusing on two types of SOEs: local and central. Our analysis is conducted using a sample of Chinese SOEs, exclusively those subject to government pay regulations, spanning from 2010 to 2022. Our dataset comprises 5,491 firm-year observations, encompassing only SOEs with complete and available data.

Our initial findings in the baseline analysis indicate a negative relationship between government CEO pay regulation (indicated as 'Post' with a value of 1 for years after 2014 and 0 otherwise, following Li, Maqsood and Zahid (2023) and firm-level corruption, measured using the natural logarithm of entertainment travel expenses in year 't' following the approach outlined by Cai et al. (2011). This negative association aligns with our initial expectations, indicating that limiting CEO compensation contribute to suppress the corruption within the firm. Importantly, these results remain consistent and robust even after considering various firm-level characteristics, year, and industry (or firm) specific effects.

Further, we establish a quasi-experiment, and identify the year 2014 as the pre-regulation period[1], as the pay regulation became strictly enforced in December 2014 and had limited effects on CCR until that time as reported by Su et al. (2020). We then following the frame work of Hu et al. (2023)

[1] Although the pay policy was initially introduced in 2004 and revised in 2009, it was forcefully implemented in 2014. Therefore, we consider 2014 as the policy year due to its strict implementation.

and categorized the sample into two groups: the treated group, identified as a corrupted declared firm, and the control group, identified as a non-corrupted declared firm. Using the Difference-in-Difference (DID) model, we found that after the implementation of the pay policy, the negative effect of CEO pay regulation on CCR is more pronounced in treated firms. These DID findings have been validated through the parallel trend assumption.

To enhance the credibility of our findings, we integrated three additional CEO pay restriction measures (CPR1, CPR2, CPR3) based on CEO cash compensation data (Li, Maqsood, & Zahid, 2023; Su et al., 2020). Our analysis robustly supports the assertion that these measures significantly curtail corruption within firms, further substantiating the favorable outcomes of government involvement in regulating executive compensation.

We also investigated the economic mechanism through which CEO pay regulation impacts CCR. Existing accounting literature suggests that higher internal control quality within a firm can effectively mitigate CCR (Wang et al., 2022). Therefore, we employed a structural equation model to examine how CEO pay regulation enhances firm internal control, consequently leading to a reduction in CCR.

This study contributes to the existing literature by examining the broader implications of CEO pay regulation on CCR. It aligns with previous research on CEO pay regulation, as exemplified in studies by Li, Maqsood, et al. (2023) and Su et al. (2020), as well as investigations into the determinants of CCR conducted by Jaggi et al. (2021), Liu (2016), and Pearce et al. (2008). What sets our research apart is its unique focus on demonstrating that regulating CEO compensation plays a significant role in reducing corruption, thus offering a fresh perspective to the CEO pay and corruption literature. Furthermore, Han et al. (2022) show that narrowing CEO compensation enhance corporate internal control. In our study, we observe that regulating CEO compensation

similarly bolsters internal control, resulting in a reduction and better management of corporate corruption. Lastly, we employ a quasi-natural experiment to investigate the causal relationship between CEO pay regulation and corruption. Our findings provide strong evidence suggesting that the negative effect of CEO pay regulation on corruption is likely causal, as the regulation of CEO compensation leads to a decrease in corrupt practices within firms.

The remaining paper is structured as follows: Section 2 introduces CEO remuneration and corruption in the institutional context. In Section 3, we review relevant literature and propose a hypothesis. Section 4 presents our sample, variables, and research models. Section 5 covers empirical findings. Section 6 concludes our research.

2 Literature Review

2.1 The Regulatory Landscape of CEO Compensation

In 1978, China initiated a transition from a centrally planned economy to a market-based one (Qian, 2000). Throughout this transformation, the government progressively ceded decision-making authority regarding investment and funding to the private sector by privatizing and publicly listing numerous SOEs. While privatization increased accessibility to a broader range of investors, the state still maintains control or substantial influence over the operations of these enterprises (Clarke, 2003). Consistent with the Communist Party's principles, senior officials prioritize the reduction of economic disparities to foster a "more balanced and harmonious society" (Banker et al., 2016). Essentially, the Chinese government leverages SOEs to accomplish various economic and social objectives, including ensuring employment stability, promoting societal harmony, and exerting direct control over sensitive sectors (Clarke, 2003).

Between 2004 and 2014, China introduced regulations governing executive compensation to pursue social, economic, and political objectives. In 2004, executive compensation regulations and strategies were enacted for SOEs. These regulations established a formula to determine the maximum salary for top executives, including the chief financial officer. Subsequently, the State-Owned Assets Supervision and Administration Commission, the Ministry of Human Resources and Social Security, and the Organization Department of the Communist Party of China expanded the policy to encompass executive compensation, retirement benefits, and insurance. Divergent opinions surround the issue of executive compensation within SOEs. Media reports allege that SOE executives are being overpaid, especially in the aftermath of the 2008 financial crisis. The public expressed dissatisfaction over the perceived excessive pay of certain SOE executives, linking their wealth to be disproportionate to the declining performance of their respective companies. Numerous news stories on SOE executive compensation further fueled these concerns. Critics questioned the fairness of SOE executive pay, both within public discourse and media narratives. Conversely, some academic research Chen et al. (2005), offers a different perspective. According to this research, SOE executives may actually receive lower compensation compared to their counterparts in non-SOEs. In general, the executive compensation framework within SOEs has faced consistent criticism for its lack of transparency and its failure to provide adequate incentives for CEOs. Despite ongoing debates, there is no consensus on whether SOE executives are receiving excessive or insufficient pay.

In reaction to public outcry and increased media scrutiny, the government responded by implementing stricter regulations in 2014 to address perceived excesses executive compensation. Additional measures were taken to closely monitor CEO remuneration, including a directive that capped base wages at twice the average salary of regular workers. According to the 2014

regulations, senior executives' share-based incentives were capped at 30% of their total annual salary. These 2014 regulations also introduced penalties for violations or delays in policy compliance. This regulatory framework from 2014 serves as an appropriate basis for conducting a regulatory impact assessment.

2.2 CEO Incentive and Corporate Corruption

Corporate corruption and CEO compensation have emerged as pivotal subjects of interest and contention within both practical and academic realms. The surge in corruption rates in recent years has prompted regulatory adjustments and a heightened focus on understanding the determinants and prevention of corruption, owing to the substantial costs incurred by market participants (Ball, 2009; Bardhan & Mookherjee, 2006; Lehman, 2023).

The underlying theory posits that individuals will engage in corrupt activities only if the benefits outweigh the associated costs. Existing literature has pinpointed performance-based compensation, as a significant incentive serve to align the incentives of management and shareholders (Alexander & Cohen, 1999; Jensen & Meckling, 1976). However, prior research contends that managers whose wealth is more sensitive to changes in the firm's stock price may have a greater incentive to partake in corrupt activities.

For instance, Rose-Ackerman (2017) construct an agency model in which corrupted incentive is portrayed as a double-edged sword, motivating CEO to exert greater effort in some instances but potentially leading to corrupted activities in others. Peltier-Rivest (2018) provide the preventing model and observe a positive correlation between a CEO compensation and corporate corruption.. Finally, Wang and Zheng (2020) find that tournament incentive is positively linked to the probability of being involved in corrupt activities.

These disparate findings may arise due to the use of different measures of corporate corruption and research design (Rose-Ackerman, 2002) or insufficient control for detection mechanisms that mitigate the effect of CEO incentives on corporate corruption (Kong et al., 2022). Wang and Zheng (2020) succinctly synthesize this body of research, incorporating tournament incentive an additional factor, and establish compelling evidence of a positive relation CEO compensation and corporate corruption. In summary, they finds that incentives, such as tournament incentives, empower CEOs to exploit firm resources for personal gain. This phenomenon is particularly evident in China's institutional framework, where lower-level government officials vie for promotion by fostering local economic growth. While the theoretical expectation is a convex wage scale to stimulate effort in this tournament-style promotion system.

2.3 Hypotheses Development

2.3.1 CEO Pay Regulation and Corporate Corruption

Our hypotheses are rooted in tournament theory, specifically the concept of a rank-order tournament contract, as articulated by Lazear and Rosen (1981). This framework is designed to elicit an efficient level of effort from workers through a well-structured pay system. In essence, a wider pay gap is anticipated to result in heightened executive effort. A smaller pay disparity may not sufficiently incentivize management members to actively participate in the managerial tournament or stimulate their efforts to secure the top executive position.

Tournament theory also suggests that a more substantial pay disparity can attract talented managers, positively influencing the quality of management and, consequently, corporate ethics—both professional and unprofessional (Park et al., 2022). The study by Wiggenhorn et al. (2016) suggests that powerful CEOs, indicated by a significant pay disparity, positively impact the quality of employee relations. Conversely, Wang and Zheng (2020) present contrasting findings, reporting

that highly paid executives leverage their power for personal gains, misuse firm resources for personal purposes, and engage in corrupt activities.

However, the Chinese political institution is characterized by regional decentralized economic management and centralized cadre management (Xu, 2011). Local government officials, empowered with a high level of autonomy in economic decision-making, participate in a competition where superior local economic performance is rewarded with promotion within the bureaucratic hierarchy. The effectiveness of this promotion mechanism in fostering local economic growth has been explored both theoretically (Maskin et al., 2000) and empirically (Jia et al., 2015). Additionally, executives in SOEs confront multiple objectives, encompassing the enhancement of economic performance and the maintenance of ethical stability. Their performance is assessed not only based on the firm's profitability but also on its social performance (Teets et al., 2017). SOEs' executives receive performance-based bonuses determined by the State-Owned Assets Supervision and Administration Commission of China (SASAC), involving explicit policy guidelines and evaluation criteria that include non-financial measures such as ethics and corruption (Fan & Grossman, 2001). Consequently, these performance-based bonuses offer direct incentives for SOEs' executives to elevate the corporate ethical environment. In alignment with existing literature, we propose that constraining incentives for top executives can control their power, thereby reducing corruption at the firm level.

H1: The Government regulation for CEO compensation has negative impact on corporate corruption**.**

2.3.2 CEO Pay Regulation and Corporate Corruption: Types of State-Owned Enterprises

This study delves into the nuanced effects of CEO pay regulation on CCR within different categories of SOEs in China. Given the prevalence of political governance as a key mechanism in China, the appointment of SOE CEOs is largely orchestrated by the government, with notable variations between local and central government levels (Jin et al., 2022). Our central argument posits that the impact of CEO pay regulation is markedly different for central and local SOEs. In the Chinese landscape, CEOs of SOEs function as de facto government officials with political ranks, navigating a relatively insular internal labor market (Chen et al., 2018a). This scenario holds two noteworthy implications for CEO ethical behavior. Firstly, the closed nature of the internal labor market for SOE CEOs makes it challenging for them to secure similarly prestigious external employment opportunities if they depart from the established system (Bai et al., 2019). Consequently, CEO are incentivized to exercise prudence, aiming for performance excellence without committing errors to secure their ranks and promotions within the existing system. This imperative for cautious behavior is accentuated for central SOE CEO due to their higher political ranks compared to their counterparts in local SOEs (Lu & Zhu, 2020).

Secondly, as SOE CEOs are essentially government officials with political ranks, and with a diminishing number of CEOs at the upper echelons of the political ranking pyramid, those with elevated political ranks face stringent government monitoring (Chen et al., 2018b). This heightened scrutiny makes it more challenging for CEOs of central SOEs to engage in unethical or corrupt activities. Consequently, CEOs of SOEs exhibit reduced motivation to participate in any form of misconduct or corrupt activities and are subjected to more stringent disciplinary measures in the event of transgressions. In essence, CEOs of central SOEs undergo the strictest monitoring, rendering them less inclined to engage in any misconduct. Integrating these two arguments, we posit the following hypothesis (H2):

H2: The impact of government regulation for CEO pay on corporate corruption is more pronounced for Central SOEs compared to their local counterparts.

3 Data Sample and Variable Measurement

3.1 Sample Selection and Source

Our data sample focuses on State-Owned Enterprises (SOEs), as the government directly influences SOEs and their compliance. To construct our dataset, we gathered data from all SOEs listed on the stock markets in Shenzhen and Shanghai, encompassing the period from 2011 to 2020. This timeframe was selected because it corresponds to a period during which most Chinese-listed companies had access to comprehensive data on corporate misconduct.

To ensure the robustness of our variables, we meticulously followed the criteria outlined in prior research (Li, Sahil, et al., 2023). This process involved excluding financial enterprises, companies with special treatment (ST) status, and those with incomplete data, resulting in a final dataset comprising 5,491 firm-year SOEs observations for our analysis.The financial data was sourced from the China Stock Market and Accounting Research (CSMAR) database, which provided us with essential information regarding executive compensation, employee salaries, and corporate governance. In addition, we manually collected data on corporate corruption from the financial reports of the firms. Furthermore, we obtained the internal control index from the DIB database, enhancing the depth and breadth of our dataset for a comprehensive empirical analysis.

3.2 Variable Measurement

3.2.1 Dependent Variable

Our primary dependent variable is corporate corruption. Following the methodology established by Cai et al. (2011), we utilized the natural logarithm of entertainment and traveling costs as a

proxy for Corporate Corruption. Prior research has emphasized the advantages of using entertainment and traveling costs over survey-based, propensity-based, or perception-based corruption measures due to their objectivity, reliability, and accessibility (Agarwal et al., 2020; Giannetti et al., 2021).

3.2.2 Independent Variable

We introduce an independent variable called "Post." The purpose of this variable is to capture the potential influence of CEO pay regulation on CCR. It is binary in nature, taking the value 1 for years after 2014 and 0 for years prior to 2014. This introduction of the "Post" variable is motivated by prior research studies, specifically those conducted by Li, Maqsood and Zahid (2023), Li, Sahil, et al. (2023) and Su et al. (2020). It enables us to investigate whether changes in CEO regulation, possibly occurring after 2014, have an impact on CCR within the context of our research.

3.2.3 Measures of CEO Pay Restriction - CPR1, CPR2, and CPR3

In addition to the "Post" variable and provide more robust findings, we incorporate three distinct measures of CEO pay restriction, denoted as CPR1, CPR2, and CPR3, following the methodology outlined in studies by Li, Maqsood and Zahid (2023), Li, Sahil, et al. (2023) and Su et al. (2020).These measures are intended to assess the extent to which executive compensation is regulated within State-Owned Enterprises (SOEs), particularly in comparison to Non-State-Owned Enterprises (non-SOEs) and within SOEs themselves.

a. CPR1 - Benchmarking CEO Pay Gap

The first measure, CPR1, serves as a benchmark for evaluating executive compensation within SOEs by comparing it to non-SOEs operating in the same industry. CPR1 is computed by

determining the average pay gap between SOEs and non-SOEs for each industry and year, as follows:

$$CPR1_{i,j,t} = AvgPaygap_nonSOE_{j,t} - SOEs_Paygap_{i,j,t}$$

Where; $AvgPaygap_nonSOE_{j,t}$ represents the average pay gap for each industry (j) and year (t) using data from non-SOEs. While, $SOEs_Paygap_{i,j,t}$ measures the pay gap for each observation within SOEs, calculated as the ratio of the average compensation of the top three executives to the average wage of regular employees within SOEs.

b. CPR2 - Comparing CEO Salary to Employee Pay

The second indicator, CPR2, compares the average salary of the top three executives in SOEs to the average pay of employees within the same SOEs.

c. CPR3 - Assessing CEO Compensation Disparity

CPR3, the third indicator, is calculated as the natural logarithm of the difference between the pay of the top three executives and the compensation of other executives within the same firm. It is designed to evaluate the disparity in CEO compensation levels within the organization.

It is important to note that to ensure consistency, the values of CPR2 and CPR3 are multiplied by -1. Higher values for CPR2 and CPR3 indicate more stringent restrictions on executive compensation within the organizations under study. These measures are based on cash compensation data, which encompasses components such as base salaries, bonuses, allowances, and other benefits.

3.2.3 Firm and Board Level Control Variables

Our study includes a selection of control variables that have been previously identified as pivotal in elucidating corporate corruption (CCR). The significance of these factors has been affirmed in prior research conducted by Agarwal et al. (2020); (Giannetti et al., 2021). Firstly, we account for attributes that are specific to each business entity, such as its size (Size), which is denoted as the natural logarithm of its total assets, and its leverage (LEV), calculated by dividing total liabilities by total assets. Additionally, we take into consideration the concept of tangibility (Tang), defined as the ratio of total assets to net fixed assets. Furthermore, we assess the return on assets (ROA). Additionally, we give due consideration to the various characteristics pertaining to the board of directors and their potential impact on CCR.These characteristics encompass the proportion of independent directors on the board (Ind_Dir), the duality of the CEO's role (Duality), the CEO's chairmanship of the board, and the natural logarithm of the board's characteristics (Board). A comprehensive reference to the descriptions and interpretations of these variables is provided in Table 1.

*[**Insert**: Table 1 Variable Definition and Explanation]*

4 Research Method

To examine the impact of government CEO pay regulation on corporate corruption, we employ a different-in-difference model, utilizing Equation 1.

$$\begin{aligned} \text{Ln_CCR}_{i,\,t+1} = \quad & \alpha + \beta_1 \,\text{Treated} \times \text{Post}_{i,t} + \beta_2 \,\text{Post}_{i,t} + \beta_3 \,Treated_{i,t} + \\ & \beta_4 \,CONTROL_{i,t} + \text{Industry or Firm FE}_{j,i} + \text{YEAR}_t + \varepsilon \end{aligned} \tag{1}$$

Furthermore, we implement Equation 2, to rigorously evaluate the hypotheses set forth in Hypothesis H2.

$$\text{Ln_CCR}_{i,t+1} = \alpha + \beta_1 \text{ Post}_{i,t} + \beta_2 \text{ Post} \times \text{Local or Central SOEs}_{i,t} + \beta_3 \text{ Local or Central } SOE_{i,t} + \beta_4 CONTROL_{i,t} + \text{ Industry or Firm FE}_{j,i} + \text{YEAR}_t + \varepsilon \quad (2)$$

In Equation 1 and 2, the variable denoted as Ln_CCR represents corporate corruption, which is quantified by taking the natural logarithm of expenses related to entertainment and travel. Our primary variable of interest is the interaction term between treated (corrupted declared firm, considered as the treated group in our analysis) and "Post" (indicating whether the observation occurs after the introduction of government CEO pay regulation). This interaction term allows us to examine how the impact of government CEO pay regulation differs for treated before and after the regulatory changes.

In Equation 2, we introduce the classification of SOEs into Local SOEs and Central SOEs. The Local SOEs are firms controlled by local governments, denoted as 1 otherwise 0, while central SOEs are those controlled by the central government, represented as 1 and 0 otherwise. This differentiation enables us to consider variations in the type of SOEs and how they respond differently to CEO pay regulation.

Furthermore, the *CONTROL* is the list of control variables at firm and board level, comprising firm size, return on assets (ROA), tangibility (Tang), cash ratio (CR), the proportion of independent directors (Ind_Dir), CEO duality (Duality), and board size (BS). These controls account for additional factors that may influence corporate corruption. Additionally, our model incorporates fixed effects for firms, industries, and years, denoted as "Firm, Industry and Year FE, respectively. These fixed effects help account for specific characteristics of firms, industries, and temporal effects that could impact corporate corruption. The term ε represents the error term, encompassing unobserved factors that may affect the dependent variable.

5 Empirical Result

5.1 Descriptive Statistics

Table 2 presents the summary statistics for all variables utilized in our analysis. The dependent variable, denoted as the natural logarithm of the corporate corruption (Ln_CCR), exhibits a mean value of 15.041. Simultaneously, the average raw expenditure on entertainment and travel expenses, measured in millions of Chinese Yuan, stands at 10.858 during the observed time frame. It is noteworthy that these values align with Hu et al. (2023). The average value for government CEO pay regulation, denoted as Post is .593. This value accounts for approximately 60% of the potential impact of regulation within our dataset. Regarding the CEO pay restriction variables, CPR1 is found to have a positive value of 8.66. This indicates that the pay of CEOs in SOEs is approximately 8 times higher than that of CEOs in non-SOEs. The mean value for CPR2 is -4.303, indicating that, on average, the compensation of the top three executives is approximately four times higher than that of regular employees. CPR3 reveals a compensation gap of 15% between the top three executives and other executives within the company.

Around 28% of boards exhibit dual chair and duality, where a single individual occupies both the chairperson and CEO roles. Moreover, approximately 37% of independent directors (Ind_Dir) are in service on the board.

*[**Insert**: Table 2 Descriptive Statistics]*

5.2 Correlation Matrix

The correlation matrix, as depicted in Table 3, underscores significant associations among the variables of interest. As anticipated, Ln_CCR demonstrates negative and statistically significant correlations with CEO pay regulation (Post) and all three metrics related to CEO pay restrictions.

Additionally, specific attributes of firms, including their size (Size), profitability (ROA), and leverage (Lev), display positive correlations with Ln_CCR.

*[**Insert**: Table 3 Correlation Matrix]*

5.3 Main findings

5.3.1 *Difference-in-Difference Analysis*

We initiate our analysis by exploring the influence of government regulations on CEO compensation and its effect on corporate corruption. Our investigation is grounded in the theoretical framework established by Berg et al. (2012), positing that government intervention and regulatory measures have the potential to curb corruption at the national level. We assembled a dataset comprising 5491 observations spanning from 2010 to 2022, focusing on state-owned enterprises (SOEs). Employing a rigorous multivariate Difference-in-Difference (DiD) methodology, we compared the period before the regulations were enforced (2011-2014) with the period after (2015-2020), with 2014 serving as the pivotal year when SOEs began adhering to government-mandated pay policies.

Our DiD analysis yielded compelling results, indicating a noteworthy reduction in corruption within SOEs following the implementation of pay regulations. These findings, as presented in Table 4, offer robust empirical support for the efficacy of CEO pay regulation. Notably, even when controlling for various variables and industry-specific and year-related influences (Column 2), the results remain consistently negative and statistically significant (-.456***, with a standard error of .174). Furthermore, in Column 3, which includes a comprehensive set of control variables and firm-specific and year-specific effects, the negative effect persists (-.144** with a standard error of .021). These consistent findings underscore the reliability of our DiD estimation and emphasize

the substantial positive impact of government CEO pay regulation on corporate corruption within SOEs.

*[**Insert**: Table 4 DID Model at Different Specification]*

5.3.2 Impact of Pay Regulation on Corporate Corruption: Evidence from Types of State-Owned-Enterprises

Subsequently, we further differentiated between State-Owned Enterprises (SOEs), classifying them into two distinct categories based on their administrative hierarchy: local and central. To present our findings, we employed the Equation 2, and these findings are presented in Table 5.

The coefficient representing the interaction between Post×CentralSOE in Table 5 particular significance. Its negative sign, coupled with its robust statistical significance, sets it apart from the corresponding coefficient for Post× LocalSOE. This contrast suggests that individuals who occupy positions of higher political authority, commonly associated with central SOEs, tend to exhibit a more cautious and risk-averse disposition. As a result, they are less inclined to engage in corrupt activities.

These significant findings are consistent with the conclusions drawn in earlier research by Chevalier and Ellison (1997), Zhou (2004), and Chen et al. (2017). Their research suggests that CEOs with more political influence tend to be more cautious. They are careful because making mistakes can harm their careers. Additionally, it's harder for them to find similar job opportunities outside the current system, which also encourages caution.

***[Insert** Table 5: Impact of pay regulation on corporate corruption: Evidence from types of SOEs]*

5.4 Channel Analysis

To examine the mechanisms through which CEO pay regulations act to reduce corporate corruption, it is imperative to consider existing studies that consistently highlight weak internal controls as the primary driver of firm corruption (Wang et al., 2022). Building on this foundation, we have used following structural equation 4 and 5, where in IC represent the firm internal control quality.

$$\text{IC}_{i,t} = \alpha + \beta_1 \text{Treated} \times \text{Post}_{i,t} + \beta_2 \text{Post}_{i,t} + \beta_3 Treated_{i,t} + \beta_4 CONTROL_{i,t} + \text{Industry or Firm FE}_{j,i} + \text{YEAR}_t + \varepsilon \quad (4)$$

$$\text{Ln_CCR}_{i,t+1} = \alpha + \beta_1 \text{Treated} \times \text{Post}_{i,t} + \beta_2 \text{Post}_{i,t} + \beta_3 Treated_{i,t} + + \beta_4 \text{IC}_{i,t} \ \beta_5 CONTROL_{i,t} + \text{Industry or Firm FE}_{j,i} + \text{YEAR}_t + \varepsilon \quad (5)$$

We posit that whether the implementation of CEO pay regulations results in an enhancement of IC. Our analysis results indicate that strengthening CEO pay regulations has positively influenced firm IC which is aligning with the findings of (Han et al., 2022). The findings, presented in column 1 of Table 6 and derived from Equation 4, illustrate a positive impact of Post × Treatment on IC. Additionally, in column 2, as depicted by Equation 5, the reported results reveal that CEO pay regulations exert a negative influence on Ln_CCR by enhancing IC.

*[**Insert**: Table 6 Mechanism analysis]*

5.5 Alternative Variable Analysis

5.5.1 CEO pay restriction Measure and Corporate Corruption

To bolster the credibility of our results, we adopted the alternative variable approach, which involved including three CEO pay restriction measures following the methodology of previous

studies (Li, Maqsood, et al., 2023; Li, Sahil, et al., 2023; Su et al., 2020). This approach was integrated into our regression equation (3), with the variable "CEOpayRestriction" encompassing the three CEO pay restriction indicators: CPR1, CPR2, and CPR3.

$$\text{Ln_CCR}_{i,\,t+1} = \alpha + \beta_1\,\text{CEOpayRistriction}_{i,t} + \beta_2\,\text{CONTROL}_{i,t} + Industry_i + \text{YEAR}_t + \varepsilon \quad (3)$$

The result, as presented in columns (1-3) of Table 6, shed light on the influence of these metrics on Ln_CCR. Specifically, the coefficients for CPR1, CPR2, and CPR3 stand at -.012, -.019, and -.15, respectively, accompanied by standard errors of .001, .002, and .022. These results reveal a noteworthy and negative correlation between the measures of executive pay restrictions and corporate corruption.

Furthermore, these findings carry economic significance. For instance, considering the first CEO pay restriction measure, CPR1, which boasts a standard deviation of 14.413 and mean of Ln_CCR 15.041. The coefficient of -.012 for CPR1, as indicated in Table 6, allows us to estimate that a one-standard-deviation increase in CPR1 corresponds to a 1.3% reduction in Ln_CRR [(-.012 × 14.413) / 15.041]. These findings, both in statistical and economic terms, provide robust affirmation of hypothesis H1.

*[**Insert**: Table 7 Impact of CEO Pay Restriction Measure on Corporate corruption]*

5.6 Robustness Test

5.6.1 Controlling Anti-Corruption Campaign Effect

One potential concern regarding the conclusions presented in Table 4 pertains to the issue of endogeneity. This means that significant changes in China's political, economic, and regulatory landscape could potentially have an impact on corporate performance. Notably, a major political

development during this period was the commencement of the anti-corruption campaign in November 2012 (Duckett, 2012; Lin et al., 2018). This campaign may have had implications for corporate corruption, particularly in Chinese listed companies and state-owned enterprises (SOEs). To address this concern, we introduced two variables, *Anti_crr_Post, and Anti_crr_Post× SOEs*, into our model (1). These variables serve to account for the influence of the anti-corruption campaign. Anti_crr_Post is a binary variable indicating the number of years that have passed since the start of the anti-corruption campaign in November 2012. After making adjustments to consider the impact of the anti-corruption campaign, we present the results in Table 7. Across all columns in Table 7, the coefficients for *Anti_crr_Post× SOEs* remain statistically significant and negative. This indicates that our findings are not unduly influenced by the anti-corruption campaign.

***[Insert**: Table 8 Controlling Anti-corruption Campaign effect]*

5.7 Validation Test

5.7.1 *Parallel Trend Assumption*

To validate the accuracy of our DiD model estimation, we conducted a parallel trend analysis. This entailed examining the trends before and after the implementation of CEO pay regulations by utilizing specific time periods as indicators. The indicators, denoted as $Pre \times Treated_{t-1}$, $Pre \times Treated_{t-2}$, and $Pre \times Treated_{t-3}$, were assigned a value of 1 if the year fell 1, 2, or 3 years prior to the policy introduction, and 0 otherwise. Similarly, $Current \times Treated_{t}$, $Post \times Treated_{t+1}$, $Post \times Treated_{t+2}$, $Post \times Treated_{t+3}$, and $Post \times Treated_{t+4}$ were assigned a value of 1 in the respective 0, 1, 2, 3, or 4 years following the policy implementation, and 0 otherwise. The results of this parallel trends analysis, which are presented in Table 8 and Figure 2, confirm the presence of parallel trends.

We observed that the impact of the CEO pay policy shock was most pronounced in the first year ($Pre \times Treated_{t-3}$) but was not statistically significant. However, as time advanced, the influence of the policy became both significant and progressively less pronounced. Notably, our analysis revealed that the CEO pay policy had a substantial and notable impact in reducing corporate corruption, particularly for companies subject to stricter pay regulations introduced after 2014. These findings affirm the validity of our DiD estimation and are in line with the results presented in Table 4.

***[Insert**: Table 9 Parallel Trend Assumption and Figure 1]*

5.8.2 Propensity Scores Matching Analysis (PSM)

While our DiD design explicitly incorporates covariates as controls, concerns may persist regarding potential imbalances in covariates between treatment and control groups, which could confound our previous DiD results. To address this concern, we employ the nearest neighbor matching technique with replacement. This approach matches each firm with a history of corruption to a non-corrupt firm based on their observable characteristics. Importantly, we divided our sample into two distinct groups: the "treated" firms, identified as having a history of corruption, and the "control" group, characterized by a classification of 0 indicating no such history. Subsequently, we applied a caliper set at 0.25 times the standard error of the estimated propensity scores. In Table 10, Panel A presents the outcomes of this matching process, along with the mean values of control variables. Panel B, on the other hand, provides the results of the Propensity Score Matching (PSM) regression. This analysis evaluates the coefficient of Post×Treated in conjunction with three metrics related to CEO pay restriction (CPR1, CPR2 and CPR3). Remarkably, these findings consistently reveal a negative and statistically significant trend. This rigorous matching

procedure, which ensures comparability in firm characteristics between the treated and control groups, bolsters the robustness and credibility of our findings.

***[Insert**: Table 10 Propensity Score matching panel A and B]*

5.9.3 Placebo Test

We collected corporate corruption data manually from corporate annual reports. Notably, when dealing with missing values in entertainment and traveling cost data, we did not code them as zeros. Instead, in line with Wang et al. (2023), we opted for a placebo method to mitigate potential concerns arising from self-selection biases. In particular, we randomly assigned pseudo-treated firms and conducted 2000 simulations. Subsequently, we estimated the baseline model, in column (2) of Table 4, using these simulated data. The results from this exercise were used to construct a distribution of coefficients for SOE × Post, which is visually depicted in Figure 2.

The noteworthy outcome of this analysis demonstrates that the actual coefficient of Post× $Treated_t$ in column (3) of Table 4, equating to -.456, significantly deviates to the right from the coefficient distribution obtained from the placebo test. This clear positioning strongly indicates that the introduction of government CEO pay regulation effectively reduces instances of corporate corruption.

***[Insert** Figure 2]*

6 Conclusion

This study establishes that government-level regulations governing CEO compensation have a negative impact on corporate corruption. Employing data from China A-share state-owned enterprises (SOEs) specifically focusing on entertainment and travel expenses as indicators of

corruption, and leveraging a quasi-natural experiment, our analysis reveals a discernible decrease in firm-level corruption subsequent to the implementation of CEO pay regulations. Notably, the influence of this regulatory measure is more pronounced in central SOEs compared to local SOEs. We identify firm internal control mechanisms as the underlying economic channels through which CEO pay regulations impede corporate corruption. Our findings are bolstered by adherence to parallel trend assumptions, placebo tests, propensity score matching, and the incorporation of alternative measures of CEO pay regulation, all of which contribute to the robustness of the causal relationship established between CEO pay regulations and corporate corruption.

In summary, our results align with the notion that CEO pay regulations mitigate the complexity and prevalence of corruption. This study adds valuable insights to the extensive literature exploring the consequences of CEO pay regulations and economic determinants of corruption. Lastly, our identification of variations between different types of SOEs should be of interest to regulators aiming to comprehend the benefits of CEO pay regulations.

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Table 1 Variable Definition and Explanation

Type	Variable	Definition	Source
Dependent Variable			
Ln_CCR	Natural logarithm of corporate corruption	Ln_CCR represents the natural logarithm of corporate expenses related to entertainment and travel.	Authors calculation based on the study of (Hu et al., 2023)
Independent variable			
Post	Government CEO pay regulation	A dummy variable takes a value of 1 if the year after 2014; otherwise, it takes 0.	Authors calculation based on the study of (Li, Maqsood, et al., 2023; Li, Sahil, et al., 2023; Su et al., 2020)
CEO pay restriction proxies			
CPR1	CEO Pay Restriction 1	$CPR1_{i,j,t}$= $AvgPaygap_nonSOE_{j,t}$ -$Paygap_{i,j,t}$ Where$AvgPaygap_nonSOE_{j,t}$, is the average pay gap computing for each industry (j) and year (t) by using non SOEs. The pay gap, measured for each SOE sample observation, is the ratio of the average compensation of the top three executives to the average wage of normal workers.	
CPR2	CEO Pay Restriction 2	CPR2 compares top-3 executive pay to regular SOE employee pay.	
CPR3	CEO Pay Restriction 3	To determine CPR3, log of (Top three – other executive compensation).	
Control variable			
Size	Firm size	Firm total assets logarithm.	CSMAR Database
Lev	Firm leverage	The ratio of total liability / total assets.	
ROA	Return on assets	The ratio of earnings before interest and tax and total assets.	
Tang	Assets Tangibility	The ratio of net fixed assets / total assets.	
Duality	CEO duality	A dummy variable =1 if the CEO serves as the board's chairman.	
Board	Board size	The logarithm of the number of directors on the board.	
Ind_Dir	Independent Director	The percentage of independent directors on the board.	
Other variable used in regression analysis			
IC	Internal control	The *Dibo* internal control Index	http://www.ic-erm.com/
Local SOEs	Local state-owned enterprises	Dummy variable =1 for firms with control; by local government and zero otherwise.	Authors calculation
Central SOEs	Central state-owned enterprises	Dummy variable =1 for firms with control; by central government and zero otherwise.	

Table 2: Descriptive Statistics

	Mean	Std. Dev.	Median	min	max	N
Dependent variable						
Ln_CRR	15.041	1.262	14.970	9.358	21.664	5491
CRR	10.858	78.554	3.174	.012	2561.326	5491
Independent variable						
Post	.593	.491	1.000	0	1	5491
CPR1	8.66	14.413	7.099	-129.625	211.573	5491
CPR2	-4.303	8.804	-1.843	-137.339	-.02	5491
CPR3	-15.129	.71	-15.141	-17.851	-11.408	5491
Control variable						
Size	21.277	1.433	21.150	9.044	27.813	5491
LEV	.405	.445	0.377	0	34.677	5491
ROA	.034	.432	0.039	.316	8.441	5491
CF	6.394	3.494	7.999	0	11.03	5491
Duality	.287	.452	0.000	0	1	5491
Ind_Dir	36.774	5.26	33.330	18.18	80	5491
BS	9.207	1.849	9.000	4	18	5491
Age	20.792	5.385	21.000	4	41	5491
Other variables						
Local SOEs	.23	.421	0.000	0	1	5491
Central SOEs	.018	.133	0.000	0	1	5491
PC	.131	.337	0.000	0	1	5491

Table 3 Correlation Matrix

	Ln_CRR$_t$	Post	CPR1	CPR2	CPR3	Size	LEV	ROA	CF	Duality	Ind_Dir	BS	Age
Ln_CRR$_t$	1												
Post t	-.0345*	1											
CPR1$_t$	-.257***	.0203	1										
CPR2$_t$	-.417***	-.0436**	.468***	1									
CPR3 t	-.420***	-.224***	.0217	.0339*	1								
Size t	.669***	.0847***	-.170***	-.455***	-.448***	1							
LEV t	.232***	-.101***	-.0971***	-.150***	.0154	.384***	1						
ROA t	.0165	-.0160	.00273	.0108	-.0801***	.0195	-.133***	1					
CF t	.155***	.0921***	.0367*	-.0887***	-.189***	.254***	-.0425**	.0301	1				
Duality t	-.0174	.00972	-.0213	.0187	.00668	-.00695	.0280	.0462**	-.0166	1			
Ind_Dir t	.0990***	.0335*	-.115***	-.121***	.00475	.0790***	.0708***	-.0133	.00477	.0558***	1		
BS t	.176***	-.0822***	.0534***	-.0909***	-.138***	.228***	.0792***	-.00469	.0835***	-.0984***	-.294***	1	
Age t	-.0760***	-.0527***	-.000270	.0703***	.0853***	-.0261	.149***	-.00475	-.0335*	.0150	-.0704***	-.0250	1

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4 DID Model at Different Specification

DV= Ln_CRR$_{t+1}$	(1)	(2)	(3)	(4)
Treated$_t$		-.288	-.718***	
		(.212)	(.153)	
Post× Treated$_t$		-.206	-.456***	-.144**
		(.243)	(.174)	(.131)
Post $_t$	-.243***	-.195	-.705***	
	(.06)	(.252)	(.181)	
Size $_t$	.666***		.667***	.44***
	(.014)		(.014)	(.021)
LEV t	.035		.078	.487***
	(.092)		(.092)	(.091)
ROA t	.125		.172	.572***
	(.154)		(.153)	(.116)
CF $_t$	-.005		-.005	-.002
	(.004)		(.004)	(.003)
Duality $_t$	-.01		-.044	-.04
	(.05)		(.051)	(.038)
Ind_Dir $_t$	.008***		.008***	.004
	(.003)		(.003)	(.003)
BS $_t$	.013		.013	.021**
	(.009)		(.009)	(.01)
Age $_t$	-.004		-.003	-.049**
	(.003)		(.003)	(.02)
_cons	.676**	15.392***	-1.304***	4.324***
	(.331)	(.287)	(.41)	(1.226)
Industry-year	YES	YES	YES	NO
Firm-Year	NO	NO	NO	YES
Observations	5491	5491	5491	5491
R-squared	.565	.159	.347	.204

Table 5 Impact of Pay Regulation on Corporate Corruption: Evidence from Types of SOEs

DV= Ln_CRR$_{t+1}$	(1)	(2)	(3)	(4)
Post $_t$	-.181***	-.247***		
	(.069)	(.06)		
LocalSOE $_t$	-.155***			
	(.045)			
CentralSOE $_t$		-.245**		
		(.099)		
Post× LocalSOE $_t$	-.103		-.136	
	(.058)		(.032)	
Post× CentralSOE $_t$		-.005**		-.241***
		(.125)		(.059)
Size$_t$	.661***	.666***	.435***	.434***
	(.014)	(.014)	(.021)	(.021)
LEV$_t$	.066	.05	.472***	.483***

	(.092)	(.092)	(.091)	(.091)
ROA t	.176	.144	.561***	.572***
	(.153)	(.154)	(.116)	(.116)
CF_t	-.006	-.006	-.002	-.002
	(.004)	(.004)	(.003)	(.003)
Duality $_t$	-.007	-.004	-.037	-.038
	(.05)	(.05)	(.038)	(.038)
Ind_Dir $_t$	.009***	.009***	.004	.004
	(.003)	(.003)	(.003)	(.003)
BS $_t$	.016*	.013	.024**	.022**
	(.009)	(.009)	(.01)	(.01)
AGE $_t$	.002	-.003	-.05**	-.049**
	(.004)	(.003)	(.02)	(.02)
_cons	.731**	.621*	5.925***	5.914***
	(.331)	(.332)	(.666)	(.666)
Industry-Year	YES	YES	NO	NO
Firm-Year	NO	NO	YES	YES
Observations	5491	5491	5491	5491
R-squared	.37	.367	.304	.314

***Note**: Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1*

Table 6: Mechanism Analysis

	(1)	(2)
	IC	Ln_CRR_{t+1}
$Treated_t$	.023	-.621***
	(.031)	(.148)
Post× $Treated_t$	.028**	-.332**
	(.034)	(.164)
Post $_t$	-.101***	-.512***
	(.036)	(.172)
IC_t		.013**
		(.077)
Size $_t$	.036***	.687***
	(.003)	(.013)
LEV t	-.121***	-.003
	(.018)	(.088)
ROA t	.304***	-.363
	(.054)	(.26)
CF $_t$	0	-.007*
	(.001)	(.004)
Duality $_t$	.007	-.045
	(.009)	(.045)
Ind_Dir $_t$	0	.007**
	(.001)	(.003)
BS $_t$	.002	.012
	(.002)	(.008)

Age $_t$	-.002**	-.001
	(.001)	(.003)
_cons	5.772***	.798
	(.069)	(.555)
Industry-year	YES	YES
Observations	5491	5491
R-squared	.155	.58

***Note**: Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1*

Table 7 Alternative Variable Analysis-CEO Pay Restriction Measures

DV= Ln_CRR$_{t+1}$	(1)	(2)	(3)
CPR1 $_t$	-.012**		
	(.001)		
CPR2 $_t$		-.019***	
		(.002)	
CPR3 $_t$			-.15***
			(.022)
Size $_t$	.516***	.512***	.495***
	(.016)	(.016)	(.017)
LEV t	.301***	.164**	.177***
	(.08)	(.065)	(.064)
ROA t	-.079	-.01	-.024
	(.064)	(.06)	(.06)
CF $_t$	-.002	-.002	-.005
	(.004)	(.004)	(.004)
Duality $_t$	-.022	-.022	-.027
	(.035)	(.035)	(.034)
Ind_Dir $_t$	.004*	.004*	.005**
	(.002)	(.002)	(.002)
BS $_t$	.024***	.024***	.017*
	(.009)	(.009)	(.009)
Age $_t$	-.017***	-.018***	-.018***
	(.006)	(.006)	(.006)
_cons	3.801***	3.915***	2.19***
	(.448)	(.445)	(.489)
Industry-year	YES	YES	YES
Observations	5491	5491	5491
R-squared	.57	.578	.575

***Note**: Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1*

Table 8 Controlling Anti-Corruption Campaign Effect

DV= Ln_CRR$_{t+1}$	(1)	(2)
Treated$_t$	-.51**	
	(.227)	
Post× Treated$_t$	-.568***	-.289**
	(.196)	(.119)
Post	-.649***	
	(.198)	
Anti_ccr_Post	-.163	
	(.272)	
Anti_ccr_Post × Treated$_t$	-.332	-.017
	(.268)	(.208)
Size $_t$	.668***	.442***
	(.014)	(.021)
LEV t	.078	.494***
	(.092)	(.091)
ROA t	.173	.578***
	(.153)	(.116)
CF $_t$	-.005	-.002
	(.004)	(.003)
Duality $_t$	-.046	-.043
	(.051)	(.038)
Ind_Dir $_t$	.008***	.004
	(.003)	(.003)
BS $_t$	.013	.023**
	(.009)	(.01)
Age $_t$	-.002	-.049**
	(.003)	(.02)
_cons	1.109***	6.101***
	(.398)	(.688)
Year FE	YES	YES
Industry FE	YES	NO
Firm FE	NO	YES
Observations	5491	5491
R-squared	.369	.503

***Note**: Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1*

Table 9 Parallel Trend Assumption

DV= Ln_CRR$_{t+1}$	(1)	(2)
Pre×Treated$_{t-3}$	.082***	.131***
	(.025)	(.049)
Pre× Treated$_{t-2}$	.09**	.133***
	(.037)	(.042)
Pre× Treated$_{t-1}$	.037	.061
	(.041)	(.04)
Current× Treated$_{t}$	-.006	-.001
	(.045)	(.038)
Post×Treated$_{t+1}$	-.106**	-.115***
	(.05)	(.037)
Post× Treated$_{t+2}$	-.192***	-.146***
	(.053)	(.029)
Post× Treated$_{t+3}$	-.188***	-.041*
	(.055)	(.022)
Post× Treated$_{t+4}$	-.19***	-.031**
	(.057)	(.029)
Size $_{t}$		.522***
		(.031)
LEV t		.439***
		(.122)
ROA t		.542***
		(.137)
CF $_{t}$		-.003
		(.003)
Duality $_{t}$		-.04
		(.042)
Ind_Dir $_{t}$		.006*
		(.004)
BS $_{t}$		.026*
		(.014)
Age $_{t}$		-.023***
		(.007)
_cons	14.887***	3.455***
	(.056)	(.729)
Year FE	YES	YES
Industry FE	YES	YES
Firm FE	NO	YES
Observations	5491	5491
R-squared	.252	.353

***Note**: Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1*

Table 10 Panel-A Match sample

Match-Unmatched	Mean		%reduct		t-test		V(T)/
Variable	Treated	Control	%bias	bias	t	p>t	V(C)
Size							
U	21.838	21.154	47.500	6.630	0.000	0.91*	
M	21.838	22.216	-26.200	44.800	-10.130	0.000	0.50*
LEV							
U	0.487	0.331	69.000	8.740	0.000	1.43*	
M	0.487	0.493	-2.500	96.300	-1.110	0.269	1.09*
ROA							
U	0.029	0.026	1.6	0.170	0.865	4.25*	
M	0.029	0.031	-1.300	14.000	-0.640	0.520	6.94*
CF							
U	6.516	6.268	6.9	0.940	0.350	1.010	
M	6.516	6.873	-9.900	-44.200	-4.570	0.000	1.020
Duality							
U	0.092	0.303	-54.800	-9.640	0.000	.	
M	0.092	0.207	-29.900	45.400	-15.090	0.000	.
Ind_Dir $_t$							
U	36.741	37.501	-14.300	-1.970	0.049	0.960	
M	36.741	35.211	28.800	-101.400	13.550	0.000	1.040
BS							
U	9.230	8.692	27.000	3.980	0.000	0.73*	
M	9.230	9.513	-14.200	47.500	-5.830	0.000	0.50*
Age							
U	22.936	19.979	59.000	8.640	0.000	0.75*	
M	22.936	23.812	-17.500	70.400	-7.870	0.000	0.69*

Panel B: PSM model

	Policy impact		**Pay regulation impact**		
DV= Ln CRR$_{t+1}$	(1)	(2)	(3)	(4)	(5)
Treated $_t$	-.612*	-.025***			
	(.372)	(.318)			
Post× Treated $_t$	-1.287**	-.682**			
	(1.219)	(1.13)			
Post	-.991	-.543*			
	(1.225)	(1.135)			
CPR1 $_t$			-.011**		
			(.002)		
CPR2 $_t$				-.013**	
				(.003)	
CPR3 $_t$					-.096**
					(.047)
Size$_t$		.114***	.121***	.103***	.137***
		(.024)	(.026)	(.027)	(.027)

LEV_t		2.558***	2.565***	2.574***	2.531***
		(.172)	(.164)	(.173)	(.173)
ROAt		1.861***	-.641	1.882***	1.868***
		(.603)	(.454)	(.603)	(.578)
CF_t		-.012	-.005	-.012	-.011
		(.007)	(.007)	(.008)	(.008)
$Duality_t$		-.698***	-.693***	-.686***	-.683***
		(.088)	(.088)	(.088)	(.088)
Ind_Dir_t		-.008	-.011**	-.009	-.009
		(.005)	(.005)	(.005)	(.005)
BS_t		.084***	.081***	.086***	.089***
		(.016)	(.016)	(.016)	(.016)
AGE_t		.106***	.103***	.106***	.105***
		(.006)	(.006)	(.006)	(.006)
_cons	14.991***	9.224***	9.243***	9.444***	10.128***
	(.408)	(.624)	(.555)	(.57)	(.692)
Observations	3405	3405	3405	3405	3405
R-squared	.125	.329	.338	.33	.33

***Note**: Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1*

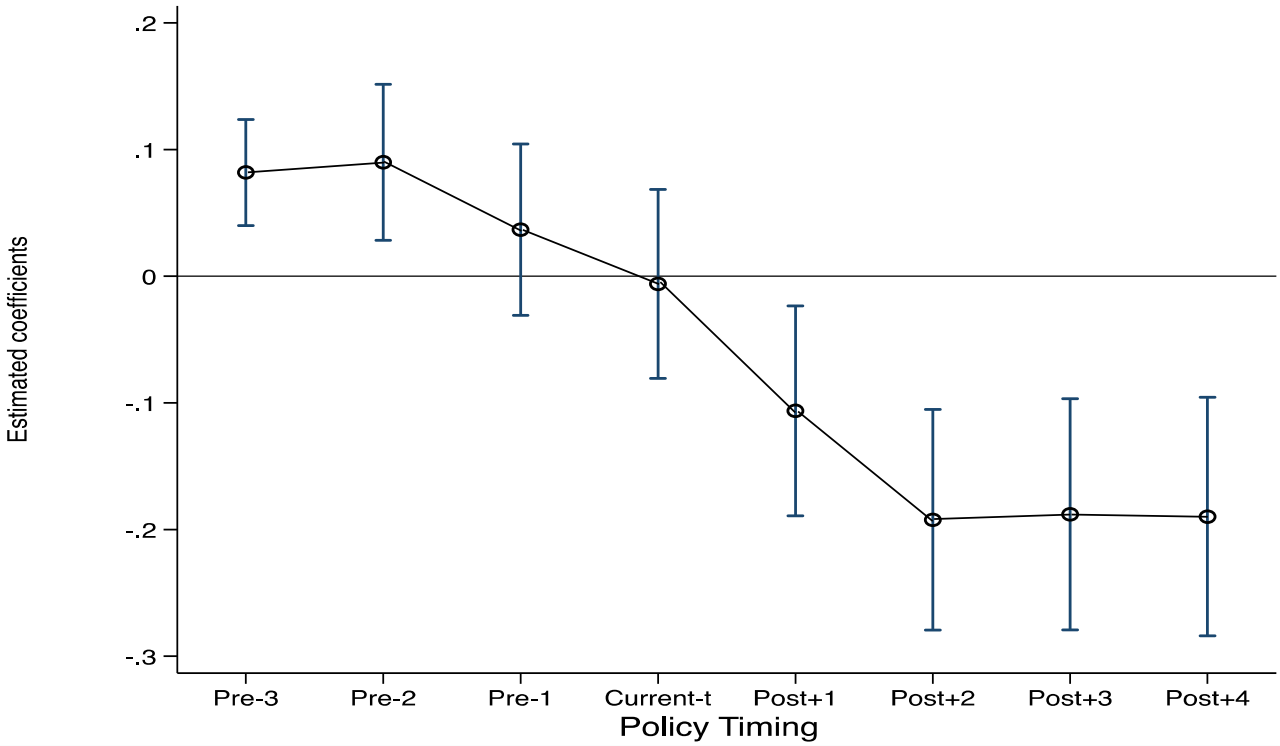


Figure 1: Parallel Trend Assumption Test

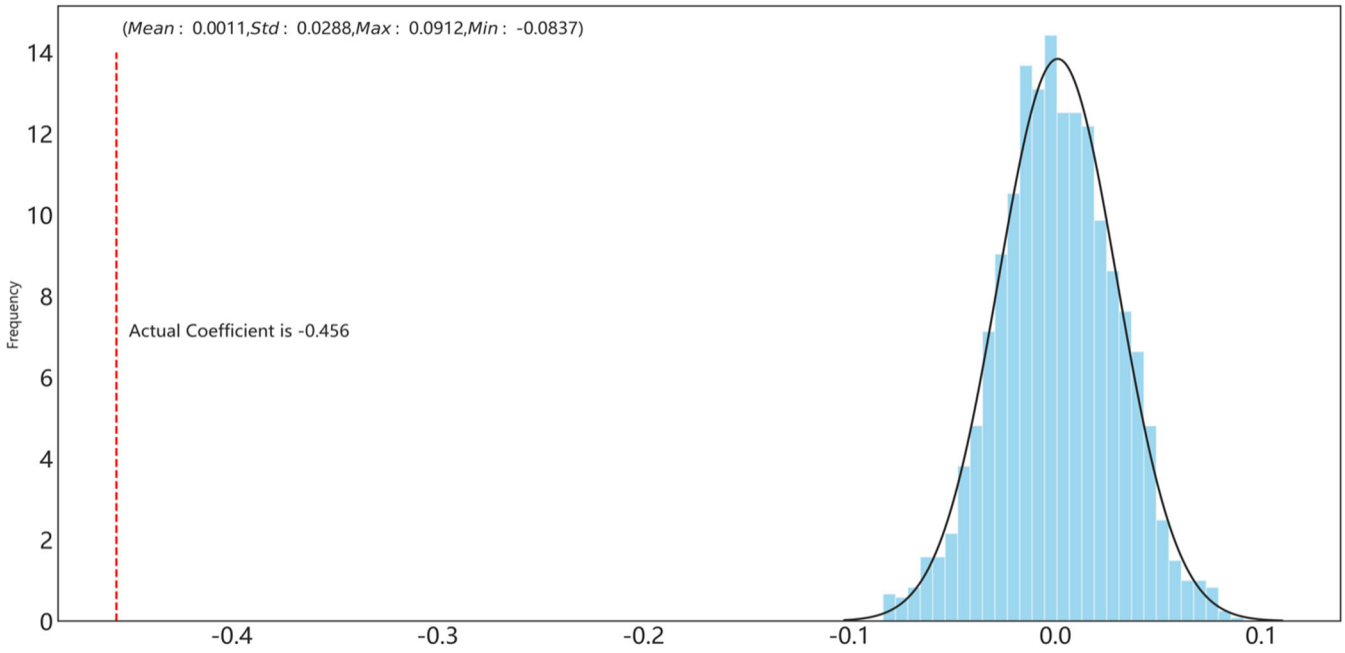


Figure 2: Placebo Test