Restricting CEO Pay Backfires: Evidence from China

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Abstract

Using the pay restriction imposed on CEOs of centrally administered state-owned enterprises (CSOEs) in China in 2009, we study the effects of limiting CEO pay. Compared with CEOs of firms not subject to the restriction, the CEOs of CSOEs experienced a significant pay cut. In response to the pay cut, CEOs increased the consumption of perks and siphoned off firm resources for their own benefit. Ultimately, the performance of these firms dropped following the pay restriction. Our findings suggest that restricting CEO pay distorts CEO incentives and brings unintended consequences. Our findings caution against limiting CEO pay.

1. Introduction

Should CEO pay be restricted? Proponents of restrictions on CEO pay argue that executive pay is excessive and unjustified by performance, and should thus be restricted (e.g., Bebchuk and Fried 2003, 2004; Bebchuk 2007). Opponents argue that regulating compensation contracts between executives and shareholders causes unintended consequences and may create more problems than it solves (e.g., Jensen and Murphy 1990; Kaplan 2007; Murphy and Jensen 2018). Despite the intense debate on this controversial issue, there are few empirical studies in the U.S. regarding the effects of directly restricting CEO pay, because such restrictions may preempt state corporation laws.[1]

In this paper, we investigate the consequences of CEO pay restriction using Chinese data. In September 2009, the central government of China introduced a regulation to limit executive salaries for the country's centrally administered state-owned enterprises (CSOEs).[2] The regulation appears to have been triggered by disclosures of overpaid executives. In April 2008, 20 executives in the oil industry were reported to have received over one million Chinese yuan (CNY), which was more than 40 times the average pay of workers in Chinese firms in 2007. Fourteen of the 20 executives were from two CSOEs, China Shenhua Energy and China Oilfield Services Limited.[3] On September 16, 2009, six administrative departments of the central government of China jointly issued a policy document endorsed by the State Council, the highest authority for setting government policy. Although the policy was intended to provide comprehensive guidance on executive compensation, it served primarily to restrict excessive executive compensation by setting a cap on the ratio of executive compensation to employee compensation.

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[1] Executive pay regulation in the U.S. has taken place mainly through taxation. For instance, the Internal Revenue Code Section 162(m) of 1992–93 limits the deductibility of non-performance related compensation over one million dollars. The effect of the regulation has been at best mixed (see Perry and Zenner 2001; Rose and Wolfram 2002; Balsam and Ryan 2007). For a comprehensive discussion of executive pay regulations, see Murphy and Jensen (2018).

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

[3] The news was posted on people.com.cn, the web section of *People's Daily*, which is the largest official newspaper in China (http://energy.people.com.cn/GB/71895/7125606.html, in Chinese). Similarly, the disclosure of executive compensation in March 2008 by Ping An Insurance, the largest insurance company in China, caused a huge public outcry. The CEO pay of Ping An Insurance Group was 2,751 times the average national pay of workers (http://www.china.com.cn/review/txt/2008-03/28/content_13779419.htm, in Chinese).

The introduction of pay regulation in China provides an ideal setting to examine the effects of pay restriction on CEO behavior and firm performance.[4] First, the regulation is exogenous to firm performance, reducing endogeneity concerns regarding CEO pay and firm performance. Second, the pay restriction applies only to CSOEs but not local state-owned enterprises (LSOEs) or private (non-SOE) enterprises. This enables us to conduct difference-in-differences (DiD) tests to sort out the effects of pay restriction on CEO pay and incentives.

Using a sample of CSOEs and non-CSOEs during 2005–2015, we find a significant pay cut for the CEOs of CSOEs. As the measure of CEO pay, we use basic salary plus bonus (cash compensation) but omit incentive compensation, such as restricted stock and stock options, as very few firms have incentive compensation schemes (Firth, Fung, and Rui 2006; Firth, Leung, and Rui 2010; Cao, Pan, and Tian 2011; Cheng, Lin, and Wei 2015). In our baseline regression model, the CEOs of CSOEs experience a drop of 17.7% relative to those of non-CSOEs after the regulation, indicating that the pay regulation was effective and binding.

To examine the effect of pay restriction on CEO incentives, we examine perk consumption and tunneling activities. As a proxy for perk consumption, we use the sum of six types of expenses (scaled by the number of paid executives), namely travel, business entertainment, overseas training, board meetings, company cars, and meeting expenses, as in Gul, Cheng, and Leung (2011) and Xu, Li, Yuan, and Chan (2014), who study the effect of perks on stock price informativeness and stock price crash risk, respectively. We hypothesize that these expenses are correlated with CEO incentives for perk consumption, although these expenses are also incurred during normal business activities. Perks are often granted as allowances, and the unused part may even be pocketed by executives (Firth, Leung, and Rui 2010). In the base regression model, we find a 20% increase in perk consumption in CSOEs relative to non-CSOEs after the pay regulation. Furthermore, we find that CEOs who experience higher pay cuts consume more perks.

We use net other receivables as a proxy for tunneling activities, following Jiang, Lee, and Yue (2010). This variable measures the extent to which controlling shareholders use intercorporate loans to siphon funds

[4] While the pay regulation is intended for all executives, we focus on the compensation of general managers, who are equivalent to CEOs in the U.S.

from firms. Since the influential paper by Jiang, Lee, and Yue (2010), this variable has been frequently used as a proxy for the extent of tunneling in Chinese firms (Busaba, Guo, Sun, and Yu 2015; Liu, Luo, and Tian 2015; Liu, Miletkov, Wei, and Yang 2015; Li, Liu, Ni, and Ye 2017). Consistent with the evidence from perk consumption data, we find a significant increase in tunneling among CSOEs. Relative to non-CSOEs, the extent of tunneling increased by 23.3% after 2009. Furthermore, CSOEs whose CEOs experience higher pay cuts engage in more tunneling of firm resources. Compared with non-CSOEs, the extent of tunneling for such firms increased by as much as 31.4% after 2009.

Our findings suggest that the CEOs of CSOEs consume more perks and tunnel more firm resources to compensate for the pay cuts. A natural question that arises is whether CSOE performance deteriorates following the pay restriction. We find that the return on sales (ROS) of CSOEs drops significantly after the pay regulation. The DiD in ROS between CSOEs and non-CSOEs is 3.85%, driven mainly by the decrease in ROS of CSOEs after 2009. We also find that the deterioration is more severe for CSOEs whose CEOs experienced higher pay cuts.

One may argue that CSOEs suffered from the global financial crisis of 2008, which led to the CEO pay cuts, which in turn encouraged CEOs to consume more perks and tunnel more resources. However, our evidence is inconsistent with such an interpretation. First, we find that both CSOEs and non-CSOEs start to recover in 2009—one year after experiencing significant performance drops in 2008—which suggests that the effects of the financial crisis on Chinese companies were transitory and unlikely to be the cause of the performance declines in CSOEs after the pay regulation was implemented. Second, when we partition CSOEs into two groups by change in performance around the crisis, we find no difference in perk consumption and tunneling between the two groups. This suggests that the crisis-caused performance decline of CSOEs did not induce CEOs to consume more perks and tunnel more firm resources. We also conduct several robustness tests using alternative measures for executive compensation, perks, tunneling, and an alternative control sample, and find robust results.

Our study adds to the growing literature on pay restriction. Dittmann, Maug, and Zhang (2011) analyze the effect of CEO pay restrictions and find that many restriction proposals may have unintended consequences.

Thanassoulis (2012) develops a theoretical argument for limiting banker pay. Cadman, Carter, and Lynch (2012) show that executive pay restrictions associated with the Troubled Asset Relief Program deterred participation in the program. Cebon and Hermalin (2015) derive conditions under which limits on performance-based payments can enhance efficiency and benefit shareholders. Dhole, Khumawala, Mishra, and Ranasinghe (2015) study the effect of the California Nonprofit Integrity Act of 2004 on CEO compensation and find that contrary to the act's objective of ensuring "just and reasonable" executive compensation, CEO compensation for affected nonprofit organizations increased relative to unaffected nonprofit organizations. Kleymenova and Tuna (2018) find that regulating executive compensation at U.K. financial institutions had the desired effect on incentives to take risks but also had the unintended consequence of increasing executive turnover. Our experimental setting utilizes a policy targeted at directly regulating executive compensation and provides evidence that restricting CEO pay distorts CEO incentives and hurts firm performance.

In a recent paper, Abudy, Amiram, Rozenbaum, and Shust (2019) conduct an event study of the passage of a law in Israel restricting executive pay to a binding upper limit in the insurance, investment, and banking industries. They find significantly positive abnormal announcement returns in these industries; thus the pay restriction appears to benefit shareholders, at least in the short term. Our findings from CSOEs in China indicate that limiting CEO pay backfires. In addition to institutional differences in Israel and China, our study differs from that of Abudy, Amiram, Rozenbaum, and Shust (2019) in at least two important ways. First, they use a sample of 20 firms in the financial industry, whereas we use all CSOEs covering a broad range of industries.[5] Second, they focus on the short-term market reaction to the pay regulation announcement, whereas we focus on the effect of the pay regulation on long-term firm performance.

Our study provides important insights surrounding the controversial debate on the "pay ratio disclosure rule." Initially proposed in the Dodd-Frank Act and finally adopted by the Securities and Exchange Commission in August 2015, the rule requires disclosure of the ratio of CEO pay to the median pay of all

[5] As a robustness check, we remove firms in the financial industry from our sample and confirm that our results remain intact.

employees. The pay-ratio disclosure is mandated for fiscal years beginning on or after January 1, 2017. The provision is based on the implicit assumption that CEO pay is excessive and that disclosure of the ratio will create public pressure to lower CEO pay.

Proponents of the disclosure rule claim that large pay gaps undermine coordination by creating feelings of relative deprivation among lower-level managers and employees, and that an egalitarian approach with smaller pay gaps may lead to greater productivity (Cowherd and Levine 1992; Bloom 1999; Henderson and Fredrickson 2001). Using pay ratios disclosed in 2017 and 2018 for Russell 3000 firms, Boone, Starkweather, and White (2019) find evidence that the disclosure of high pay ratios leads to negative media attention, shareholder voting dissent on executive compensation, and diminishing labor productivity gains. Opponents argue that a high pay gap ratio is a result of competition for talented managers and should not be lowered under pressure. In fact, Faleye, Reis, and Venkateswaran (2013) and Mueller, Ouimet, and Simintzi (2017) show that within-firm pay inequality is positively correlated with operating performance and firm valuation. Firth, Leung, and Rui (2010) find similar evidence using a sample of non-financial companies listed on the Shanghai and Shenzhen stock exchanges. In a survey paper on executive compensation, Edmans, Gabaix, and Jenter (2017) predict that the focus on pay ratios and social pressure to lower them are likely to induce unintended consequences that will make CEO pay less sensitive to firm performance and reduce shareholder value. Our study provides supporting evidence—limiting CEO pay distorts CEO incentives and negatively affects firm performance.

We acknowledge that our findings using CSOEs may not be generalizable to other countries, given the unique political and economic system in China. The Chinese economic system is a socialist market economy in which state-owned enterprises play a predominant role within a market economy. The effects of restricting pay at a state-owned firm may be different from restricting pay at a private firm, as evidenced in Abudy, Amiram, Rozenbaum, and Shust (2019). Although we acknowledge that the Chinese evidence may not be generalizable to market economies, our finding that CEO pay restriction brings undesirable consequences even in a socialist market economy cautions against restricting CEO pay.

Our study proceeds as follows. Section 2 provides a brief review of the 2009 pay regulation in China. Section 3 discusses the data construction and methodology used for our tests. Section 4 presents the empirical results and Section 5 presents the robustness tests. Section 6 concludes the paper.

2. The 2009 pay regulation

On September 16, 2009, six administrative departments[6] in China jointly issued the Guideline to Further Regulate Executive Compensation in Central State-Owned Enterprises (hereafter, the Guideline) with the consent of the State Council, the chief administrative authority in China. The Guideline itself is a classified document and is not available to the public, but the government posted the announcement of its issuance and a summary of the Guideline on its official website.[7] The Guideline suggests that executive compensation should consist of a basic salary, pay for performance (bonuses), and incentive compensation. It also indicates that because incentive compensation, such as stock options, is under development, the Guideline focuses on basic salary and pay for performance. The Guideline stipulates that the design of executive compensation packages should strike a balance between motivating executives and narrowing the pay disparity between executives and employees. It indicates that the annual salary of executives should be in line with that of employees and that pay for performance should be based on the business performance of the enterprise.

Although the Guideline was issued as a comprehensive guide to regulating executive compensation, the media regarded it primarily as a regulation to restrict excessive executive compensation. Before the Guideline, a few inchoate regulations had been issued, among which the most comprehensive was the Provisional Guideline to Regulate Executive Compensation in Central State-Owned Enterprises (hereinafter, the Provisional Guideline) issued by the State-Owned Assets Supervision and Administration Commission of the State Council (SASAC) on June 11, 2004. The Provisional Guideline was considered

[6] The Ministry of Human Resources and Social Security, Ministry of Finance, State-Owned Assets Supervision and Administration Commission, National Audit Office, Ministry of Supervision, and Organization Department of the Communist Party of China.
[7] http://www.gov.cn/jrzg/2009-09/16/content_1419270.htm (in Chinese).

to be ineffectively enforced. However, there are several reasons to believe that the 2009 pay regulation is binding and effective. First, although the exact formula to determine executive compensation is confidential and not known to the public, the Guideline appears to set a cap on the pay gap ratio. The excerpt of the Guideline discloses that the basic salary of executives is to be 5 to 7.5 times the average wage of all CSOE employees in the previous year, depending on the management difficulty of the firm. Second, the Guideline was issued jointly by six administrative departments with the consent of the State Council, which indicates the seriousness of the regulation and the government's political will to implement it. Moreover, two of those six departments—SASAC and the Organization Department of the Communist Party of China—are in charge of hiring CSOE executives. Third, the Guideline emphasizes the monitoring duty of the departments, including the National Audit Office and the Ministry of Supervision, and requires punitive measures to be taken in a timely manner should any irregularity be detected.

3. Data and summary statistics

This section describes the sample selection process and presents summary statistics for the main outcome variables: CEO compensation, perk consumption, tunneling, and firm performance.

3.1. Data construction

Our sample selection process starts with all companies listed on the Shanghai and Shenzhen stock exchanges. We obtain executive compensation, financial statements, and ownership data from the China Securities Market and Accounting Research (CSMAR) database, which is the most widely used database for Chinese financial market research. The sample period covers 2005 to 2015. We start with 2005 because the data on executive compensation prior to 2005 are poor.[8] To be included in the sample, a firm must satisfy the following criteria:

1. the ultimate controlling shareholder can be identified;

[8] Early studies of CEO compensation in China could only use the total compensation of the three highest paid executives as a proxy for CEO compensation (e.g., Firth, Fung, and Rui 2006).

2. the number of employees is more than 10;

3. the CEO's annual compensation is more than 1,000 CNY; and

4. the total assets and total sales are greater than 0.

To investigate the effect of the policy introduced in 2009, we require the company to have at least one observation in both the pre- (2005–2008) and post-policy (2010–2015) periods. We further require that the identity of the company as a CSOE remains unchanged throughout the sample period. A company is identified as a CSOE if its ultimate controlling shareholder is SASAC. SASAC publishes a list of CSOEs. Our sample of CSOEs are the publicly traded entities subordinate to the CSOEs as listed by SASAC.

We collect the perk consumption data from the footnotes of the sample firms' financial statements. As a proxy for perk consumption, we use the sum of six types of expenses: travel, business entertainment, overseas training, board meetings, company cars, and meeting expenses. We obtain voluntarily disclosed perk expenses from the "Cash Payment for Expenses Related to Operating Activity" section of financial statement footnotes as in Gul, Cheng, and Leung (2011) and Xu, Li, Yuan, and Chan (2014).[9] We take the following steps to construct the perk consumption data. First, we manually download the financial statements of all CSOEs during 2005–2015 from the Shanghai and Shenzhen stock exchange websites and hand-collect their perk data from the "Cash Payments for Expenses Related to Operating Activity" section. Second, for non-CSOEs, we collect perk data only for a matched sample, because manual collection of data is necessary and there are 1,212 unique non-CSOEs during our 11-year sample period. We match each CSOE with at most two non-CSOEs in the same industry that are closest in total assets.[10] We are able to find 190 matching non-CSOEs for 98 CSOEs. For the matched sample of non-CSOEs, we download their financial statements and collect the perk information.

[9] Since 2009, the disclosure of perk expenses has been mandatory in the "Management Expenses" section; however, we could not use perk expenses disclosed in the "Management Expenses" section because they are not available for most firms before 2009.

[10] We use the industry classification guidance released by China Securities Regulatory Commission in 2012 (http://www.csrc.gov.cn/ pub/csrc_en/newsfacts/release/201301/t20130118_220575.html). Altogether, there are 76 industry classifications.

Table 1 presents our sample composition by year. In the full sample, there are 102 unique CSOEs and 1,212 unique non-CSOEs. We obtain perk data for 57 of 102 CSOEs and 75 of 190 matched non-CSOEs.

We note that our perk data have sample selection bias because perk disclosure in the "Cash Payments for Expenses Related to Operating Activity" section is not mandatory. The bias is unlikely to drive our findings that perk consumption increased following the pay regulation. There is no reason to suspect that firms voluntarily disclosed more perk consumption following implementation of the pay regulation. If anything, firms are likely to understate increases in perk consumption.

3.2. Summary statistics

Table 2 presents the summary statistics. All of the variables are defined in Appendix 1. We winsorize all ratio variables that have financial variables as denominators at 1% and 99%. Panel A of Table 2 presents the summary statistics for firm characteristic variables. A median-sized CSOE is more than twice the size of a median-sized non-CSOE in terms of total assets and total sales, and the median market capitalization of CSOEs is almost twice that of non-CSOEs. Non-CSOEs realize a higher market to book ratio, with a median of 2.76 compared with 2.41 for CSOEs. Whereas the ultimate controlling shareholder of all CSOEs is the central government, the controlling shareholders of non-CSOEs can be local governments, industrial or financial companies, or even individuals. The block ownership of ultimate controlling shareholders is larger in CSOEs. The mean (median) block ownership is 47% (49%) for CSOEs and 37% (35%) for non-CSOEs. On average, CSOEs have a control-ownership wedge of 4.8% and non-CSOEs have a control-ownership wedge of 6.3%. The asset tangibility for CSOEs and non-CSOEs is 0.259 and 0.261, respectively. As for the sales growth rate, both CSOEs and non-CSOEs have an average of 0.2, but CSOEs have a slightly higher median (0.14) than non-CSOEs (0.11). CSOEs have higher leverage ratios. The median leverage ratios are 0.58 and 0.51 for CSOEs and non-CSOEs, respectively. Compared with non-CSOEs, CSOEs pay 0.1% less tax when scaled by total assets, with an average (median) of 0.9% (0.6%).

Panel B presents CEO compensation and CEO characteristics. For CEO compensation, we include only cash compensation—the sum of basic salary and bonuses. We exclude incentive compensation, as it

is not widely adopted by Chinese firms. Stock options have only been allowed since 2007, and as approval from the China Securities Regulatory Commission (CSRC) is required, very few firms adopt them (Firth, Fung, and Rui 2006; Firth, Leung, and Rui 2010; Cao, Pan, and Tian 2011; Cheng, Lin, and Wei 2015). During our sample period, no more than 5% of CSOEs and non-CSOEs granted restricted stocks or options to their CEOs in each year. All compensation figures are inflation-adjusted and reported in 2010 CNY. The mean annual CEO cash compensation is 542,479 CNY, which is approximately 80,135 USD.[11] Although substantially low relative to CEO compensation levels in developed markets, the annual cash compensation of Chinese CEOs is no small figure when compared with GDP per capita in China (4,560 USD in 2010). A Chinese CEO earned more than 21 times what the average Chinese worker earned in 2010. Considering that China is a socialist country, the pay gap ratio between CEOs and the average worker appears substantial. CEO compensation is higher on average for CSOEs, but as CSOEs are much larger than non-CSOEs, their CEOs are not necessarily overpaid in comparison. If anything, they appear relatively underpaid considering firm size.

An average Chinese CEO in our sample is 48 years old, and there is little difference in CEO age between CSOEs and non-CSOEs. There are significantly fewer female CEOs in CSOEs than in non-CSOEs. The proportion of female CEOs in CSOEs is only 1%, whereas the corresponding figure is 6.2% for non-CSOEs. The proportion of CEOs holding dual positions of both CEO and chairman of the board is only 5.6% for CSOEs, whereas the figure is 17.4% for non-CSOEs.

We present the statistics on perk consumption in Panel C. Perks are scaled by the number of paid executives, including CEOs, chief financial officers, and members of the board of directors and supervisory board. On average, both CSOEs and non-CSOEs have 15 paid executives. The mean value of perks per paid executive is about four million CNY (591,000 USD); this number is almost doubled in CSOEs and halved in non-CSOEs. As CSOEs are significantly larger, the level of perk consumption does not necessarily suggest that CSOE executives enjoy excessive perks. In fact, the average of total perk

[11] We use the 2010 exchange rate of 6.7695 CNY per USD throughout this paper.

consumption scaled by sales (assets) for CSOEs is 0.68% (0.47%), which is similar to the 0.66% (0.52%) for non-CSOEs. The scaled perk figures are comparable to those documented in Gul, Cheng, and Leung (2011) and Xu, Li, Yuan, and Chan (2014). We note that the mean (median) perk consumption per executive for CSOEs is about 10.7 (3.2) times CEO compensation in our sample. The level of perk consumption per executive seems enormous compared with CEO compensation, although not all perks represent wasteful consumption by executives.

In Panel D, we present variables that proxy for tunneling. We use net other receivables from the balance sheet as a proxy for tunneling, as in Jiang, Lee, and Yue (2010). The mean (median) net other receivables over total assets is 2.6% (1.1%) during our sample period (2005–2015), lower than that reported by Jiang, Lee, and Yue (2010) for 1996–2004. The other receivables balance declined after 2001, mainly due to a campaign by CSRC.

We present the ROS and return on assets (ROA) figures in Panel E. We calculate ROS as operating profit over total sales; we use operating profit because it is less subject to managerial discretion than net profit (Firth, Fung, and Rui 2006). We choose ROS as our main measure of firm performance over more popular measures such as return on equity (ROE) because Chinese listed companies frequently issued equity throughout our sample period, and equity issuance mechanically decreases ROA and ROE (Li, Megginson, Shen, and Sun 2017). In our sample, the average share capital growth is 12.3%, while in each year about 27% of the companies issued equity. We also present results for ROA, as ROA is less contaminated by equity issuance than ROE. We find that non-CSOEs deliver slightly better operating performance than CSOEs in both ROS and ROA.

3.3. Time variation in outcome variables

Table 3 presents the medians of CEO compensation, perk consumption per executive, net other receivables, and ROS by year during the 2005–2015 period for CSOEs, LSOEs, and non-CSOEs. Figure 1 visualizes the figures in Table 3.

For CSOEs, the level of CEO compensation increased monotonically during 2005–2009. After the introduction of the pay restriction policy for CSOEs in September 2009, the CEO compensation of CSOEs was stagnant until 2015. In contrast, the level of CEO compensation of LSOEs continuously increased until 2012. After 2012, the compensation level started to decline a little, possibly due to the anti-corruption campaign that started in November 2012. For non-SOEs, the level of CEO compensation continuously increased throughout the sample period. The trends in CEO compensation indicate that the pay restriction policy is binding for CSOEs, which is precisely what one would expect, because the policy is targeted at CSOEs.

Turning to perk consumption in CSOEs, it shows a modest increase during the 2005–2008 period and then sharply increased from 2009 until it peaked in 2011. After President Xi Jinping put forward the anti-corruption campaign in November 2012, perk consumption started to decrease and was cut by about 60% by 2015.[12] For LSOEs, we see a similar pattern. As for non-SOEs, perk consumption remained low until 2008 and then slowly increased throughout the sample period. We also note that the number of paid executives remained relatively constant over the sample period, and thus the trends we observe are unlikely to be driven by changes in the number of paid executives.

The level of net other receivables decreased during 2005–2009 for LSOEs and non-SOEs and then increased during 2010–2015. The level of net other receivables for CSOEs, however, remained flat during 2005–2009, and then increased sharply until it dropped in 2015.

The last three columns of Table 3 present the median ROS of CSOEs, LSOEs, and non-SOEs by year. We see improvements in firm performance during 2005–2007 for all types of firms before the significant drop in 2008 caused by the global financial crisis. Their performances quickly bounced back in 2009 and 2010, after which all three types of firms continued to suffer from poor performance. Non-SOEs

[12] On December 4, 2012, the Politburo launched an anti-corruption campaign with the announcement of the Eight-point Regulation, which restricts perk consumption for Communist Party cadres. See Lin, Morck, Yeung, and Zhao (2017) for details of the anti-corruption campaign.

consistently performed better than both CSOEs and LSOEs except in the first two years of the sample period.

4. Empirical results

In this section, we first present evidence that the pay regulation of 2009 significantly decreased CEO compensation in CSOEs. We then show that perk consumption and tunneling significantly increased in these firms while firm performance deteriorated. Finally, we discuss and exclude alternative interpretations of our results.

4.1. Univariate DiD tests

The summary statistics in Table 3 suggest that following the pay restriction regulation in 2009, the CEO compensation of CSOEs decreased, while perk consumption and tunneling increased compared with non-CSOEs. In Table 4, we conduct univariate DiD tests between CSOEs and non-CSOEs before and after the pay regulation.

Table 4 presents the results. In Panel A, we apply the DiD test to the raw figures for CEO compensation, perk consumption, net other receivables balance, and firm performance. CEO compensation, perk consumption, and net other receivables are in logarithm form. In Panel B, we use the residuals from regressing the raw figures on firm fixed effects as well as year fixed effects. The figures used in the tests are the firm-level time-series average during the sub-periods 2005–2009 and 2010–2015. Both panels present the same patterns and we focus on the changes in the residual figures for interpretation.

Before the CEO pay restriction, we find higher compensation for CEOs of CSOEs than non-CSOEs, which reverses after the pay restriction. CEO compensation for CSOEs is seen to decrease significantly, whereas that for non-CSOEs hardly changes, resulting in significantly lower CEO compensation for CSOEs after implementation of the pay regulation. The pattern of change in perk consumption and net other receivables is opposite to that of CEO compensation. Perk consumption and net other receivables are lower for CSOEs than non-CSOEs before the regulation but significantly higher afterward. Turning to ROS, we

find that firm performance for CSOEs deteriorates after the regulation but improves for non-CSOEs, so CSOEs end up performing significantly worse than non-CSOEs after the pay regulation of 2009.

In sum, the univariate test results indicate that relative to non-CSOEs, CEO compensation for CSOEs decreases after pay regulation, while perk consumption and tunneling increase, and firm operating performance deteriorates.

4.2. Pay regulation effect on CEO compensation, perk consumption, tunneling, and firm performance

We now move on to multivariate regression analysis to test the effect of the 2009 regulation on CEO compensation, perk consumption, tunneling, and firm performance while controlling for variables that might affect these outcome variables.

4.2.1. Pay regulation effect on CEO compensation

To examine the policy's effect on CEO compensation, we estimate the following regression model:

$$\begin{aligned} Log\left(CEO\,compensation\right) = {} & \beta_1 D\_CSOE \times After\,2009 + \beta_2 CEO\,age + \beta_3 Female\,CEO \\ & + \beta_4 CEO\,duality + \beta_5 Log\left(total\ assets\right) + \beta_6 ROS \\ & + \beta_7 Market\,to\,book\,ratio + Firm\,FE + Year\,FE + \varepsilon. \end{aligned} \tag{1}$$

The dependent variable is the logarithm of CEO cash compensation. The control variables include CEO and firm characteristic variables. CEO characteristic variables include CEO age, female CEO dummy, and CEO-chairman duality dummy. Firm characteristic variables are the logarithm of total assets, ROS, and market to book ratio. In all regressions, we control for both firm and year fixed effects and cluster the standard errors at the firm and year level.[13]

Table 5 reports the results. In column (1), we include only the control variables and fixed effects in the regression. Older CEOs receive higher salaries, which is likely due to longer tenure. There appears to be no gender gap in CEO pay in China. CEOs who hold board chairman positions receive higher salaries, but the statistical significance is at best marginal. Not surprisingly, we find that CEOs of larger and more

[13] The significance levels are similar when clustering the standard errors only at the firm level.

profitable firms with a higher market to book ratio are paid more. In column (2), we include our key independent variable, D_CSOE×After2009, which is the interaction of the CSOE dummy and a time-period dummy that takes the value of one for years after 2009 (i.e., 2010–2015). Because we already control for firm and year fixed effects, neither the CSOE dummy nor the After2009 dummy is included in the specification. The negative coefficient estimate for D_CSOE×After2009 captures the DiD of CEO compensation between CSOEs and non-CSOEs before and after the pay regulation and indicates that, relative to non-CSOEs, the CEO compensation of CSOEs decreased after the pay regulation. The estimate is both statistically and economically significant.

In column (3), we also control for D_CSOE×After2012, where After2012 is a time-period dummy that takes the value of one for years after 2012 (i.e., 2013–2015) because of the concern that the decrease in CEO compensation could be mostly driven by the anti-corruption campaign initiated in November 2012, which had a greater effect on the CEO compensation of CSOEs than non-CSOEs. However, we find that the coefficient estimate for D_CSOE×After2009 remains significant, ruling out the anti-corruption campaign explanation. In column (4), we exclude firms that are dual-listed in both the China A-share and Hong Kong H-share markets. CEO compensation disclosed by firms listed in Hong Kong may not reflect actual CEO compensation. The reason is that the pay packages from these firms may have been considered "too high" and not in line with domestic companies, and thus the top management of these firms "donated" their compensation to the parent company, which then returned an undisclosed salary and bonus for the year as their real compensation.[14] Our results still hold when we restrict the sample to companies listed on domestic stock exchanges only. In unreported tests, we repeat the same tests as in Table 5 using the subsample of firms for which perk consumption data are available. Although the size of the subsample with perk data available is small relative to the whole sample, the results are similar in this subsample.

4.2.2. Pay regulation effect on perk consumption

[14] "Pay cuts no cure for good governance," *South China Morning Post*, July 4, 2016.

In Table 6 we investigate the pay regulation policy's effect on perk consumption and its association with compensation changes. The dependent variable is the logarithm of total perk consumption over the number of paid executives. The control variables are the logarithms of total assets and total employee wages, as in Gul, Cheng, and Leung (2011). We control for firm size as a proxy for operating complexity because executives of more complex firms are likely to consume more perks for work-related reasons (e.g., more frequent meetings and long-distance flights). We also control for total employee wages because total perk consumption includes several types of work-related expenses that non-executive employees can also consume, such as company car expenses and meeting expenses. Controlling for firm size and employee wages helps us tease out the portion consumed by executives in their personal interest (i.e., excess perks).

In column (1), we include only control variables and fixed effects. As expected, the coefficient estimates for both control variables are positive and significant. In column (2), we add D_CSOE×After2009 in addition to the control variables. The coefficient estimate for D_CSOE×After2009 is 0.2 and is significant at the 5% level, showing that, compared with non-CSOEs, perk consumption in CSOEs increased significantly after 2009. The coefficient estimate increases to 0.25 in column (3) and is significant at the 1% level when we include D_CSOE×After2012 to control for the anti-corruption campaign effect. The increase in perk consumption (+0.249) in column (3) appears larger than the corresponding decrease (-0.132) in CEO pay in column (3) of Table 5. Exponentiating the DiD coefficient estimates implies a 12% decrease in CEO pay and a 28% increase in perk consumption per executive. Thus, the increase in perk consumption is substantially larger than the decrease in CEO pay. This finding is expected. The two numbers need not offset each other unless one assumes that CEO pay and perk consumption contribute equal amounts of utility to CEOs. It is more reasonable to assume that cash compensation provides 2.5 times the utility of perk consumption. Hence, the utility loss from a 12% drop in cash compensation is compensated for with a 28% increase in perk consumption.

Perk consumption increased significantly following the pay restriction. The question that naturally follows is whether CEOs who experienced greater pay cuts consumed more perks to compensate for their monetary losses. In column (4), we divide CSOEs into two groups by the median change in CEO

compensation before and after the pay regulation. For each CSOE, we compute the change in abnormal CEO compensation by subtracting the mean abnormal compensation during 2005–2009 from that during 2010–2015. Abnormal CEO compensation is the residual from column (1) of Table 5. We then create two dummy variables: a variable that takes the value of one if the change in compensation is lower than the median, and another that takes the value of one if the change is higher than the median. In short, we divide the CSOE dummy into two dummy variables by the median of CEO compensation change for CSOEs before and after the pay restriction, and then interact each with the After2009 dummy. The results show a statistically significant 28% increase in perk consumption for CSOEs that experienced below-median CEO compensation change, but only a 13% increase (not significant) in CSOEs with above-median compensation change. These results show that CEOs who suffer more severe pay cuts tend to consume more perks. Column (5) tests the same specification as column (4) but uses the sample period 2005–2012 to eliminate the anti-corruption campaign effect. The results remain unchanged.

In sum, the results in Table 6 suggest that CEO cash compensation and perk consumption are substitutes: when compensation decreases due to pay restrictions, CEOs increase their perk consumption to offset the pay cut.

4.2.3. Pay regulation effect on tunneling

In Table 7, we investigate the effect of the policy on tunneling activities and its association with the change in CEO compensation. The dependent variable is the logarithm of net other receivables. In column (1), we include only control variables and fixed effects. We control for the key determinants of net other receivables as in Jiang, Lee, and Yue (2010) and Liu and Tian (2012), including the logarithm of total assets, firm performance, block ownership, control-ownership wedge, asset tangibility, sales growth, leverage, and tax rate. We do not include the state ownership dummy or regional marketization as control variables because we control for firm fixed effects. More profitable firms have fewer net other receivables. Block

ownership, control-ownership wedge, and sales growth are not significantly related to net other receivables. Asset tangibility and tax rate are negatively and leverage is positively related to net other receivables.

The positive coefficient estimates for D_CSOE×After2009 in columns (2) and (3) indicate an increase in the extent of tunneling by CSOEs after 2009 relative to non-CSOEs. The coefficient estimate is significant at the 5% level in column (2) and the 10% level in column (3), in which we use D_CSOE×After2012 to control for the anti-corruption campaign. In column (4), we again divide CSOEs into two groups by the median of change in CEO compensation around 2009 and create two dummy variables: a variable that takes the value of one if the change in compensation is lower than the median and another that that takes the value of one if the change is higher than the median. When we interact these variables with the After2009 dummy, the results suggest that tunneling increased by 31.4% for CSOEs whose CEOs experienced a bigger pay cut. This increase in tunneling is statistically significant. In sharp contrast, tunneling increased insignificantly by only 14.1% for CSOEs whose CEOs experienced smaller pay cuts. In column (5), we restrict the sample period to 2005–2012 to remove the anti-corruption effect on tunneling and find the results unchanged.

Overall, Table 7 provides evidence that CSOEs whose CEOs experience a significant cash compensation decrease engage in more tunneling activities. This result is consistent with the view that when CEO cash compensation decreases due to a pay restriction policy, they tunnel more resources from the company to compensate for their utility loss, indicating that tunneling, like perk consumption, serves as a substitute for cash compensation.

4.2.4. Pay regulation effect on firm performance

One may argue that the estimated effect of increases in perk consumption and tunneling is essentially a relabeling of corruption compensation. The Chinese government may have restricted executive pay in CSOEs to placate its disgruntled citizens and at the same time condoned more perk consumption and tunneling in these firms to placate executives. This being the case, the effect of pay regulation on firm performance should be

neutral. In this subsection, we examine whether CSOE performance deteriorated following the pay restriction. For measures of firm performance, we do not use stock returns but accounting performance measures, for several reasons. First, there is evidence that stock prices in Chinese stock markets are strongly influenced by noise traders (Eun and Huang 2007; Sun, Tong, and Yan 2009; Tong and Yu 2012). Second, stock returns in China are mostly a function of macro events (Morck, Yeung, and Yu 2000) over which CEOs have no control. Third, state-owned enterprises base performance-related CEO pay on accounting profitability rather than on stock returns (Firth, Fung, and Rui 2006). Table 8 presents the results. As the dependent variable, we use ROS in columns (1) to (3) and ROA in columns (4) to (6), respectively. In column (1), we find a significantly negative estimate for D_CSOE×After2009, indicating that the ROS of CSOEs decreased more after 2009 relative to non-CSOEs. The magnitude of the change is -3.85%. This represents 60% of the mean ROS (6.4%) of CSOEs. Although the change in ROS appears large, we note that earnings are also quite volatile. The standard deviation of ROS for CSOEs is 15.6%, and hence the decrease in ROS attributable to pay regulation is about one-quarter standard deviation.

In the next column, we add D_CSOE×After2012 to control for the 2012 anti-corruption campaign and find the results unchanged. The effect of the anti-corruption campaign on firm performance is not significant. In column (3), we examine whether the decrease in CEO pay is directly related to the decrease in firm performance. We use the same dummy variables as in column (4) of Table 7, based on the median of CEO compensation change for CSOEs before and after the pay restriction. We find that CSOEs whose CEOs received a bigger pay cut experienced four times the drop in ROS as those whose CEOs received a smaller pay cut.

Using ROA as the measure of firm performance, we find similar but statistically weaker results. The decrease is estimated to be 1.15% in column (4) and 1.16% in column (5), representing about 32% of the sample mean (3.6%) for CSOEs. When we partition CSOEs into two groups by median CEO compensation change before and after the pay restriction, we find an economically and statistically significant decrease in ROA only for CSOEs whose CEOs experienced a bigger pay cut.

Although we argue that the poor performance of CSOEs whose CEOs experienced a bigger pay cut is due to CEOs' increased incentive to consume more perks and tunnel firm resources, another possibility is decreased incentive to inflate earnings. It may be that with the pay restriction, CEOs have less incentive to manipulate and increase earnings, which will lead to the appearance of poorer performance after pay restriction. To examine whether a change in earnings manipulation contributed to the poor performance of CSOEs following pay regulation, we estimate discretionary accruals of CSOEs by year and find little change in their magnitude over time during our sample period.

5. Robustness tests

In this section, we run a battery of robustness checks. We first look at whether our findings are driven by the global crisis of 2008. Second, we test for parallel time trends before the regulation, a key assumption for the validity of the DiD approach that our main tests rely upon. Third, we use an alternative control sample of LSOEs. Fourth, we control for additional fixed effects. Lastly, we use different proxies for executive compensation, perk consumption, and tunneling. Our findings survive all these robustness tests.

5.1. Crisis effect on compensation, perks, and tunneling

One identification issue in our study is that the post-regulation period largely overlaps with the post-crisis period of the 2008 financial crisis. One may argue that CSOEs were more sensitive to the financial crisis, which might result in the same findings we document, that is, that CSOEs suffered more after the crisis, resulting in lower compensation for their executives, which in turn encouraged them to consume more perks and tunnel more resources. Thus, our findings may have little to do with pay regulation and more to do with the crisis-induced performance decline of CSOEs. However, as shown in Table 3 and Figure 1, CSOEs, LSOEs, and non-SOEs all started to recover right after 2008, the year when they experienced significant performance drops. We note that the recovery in performance took place before the decrease in CEO compensation and the increase in perk consumption and tunneling in CSOEs, indicating that the pay regulation effect, rather than the crisis effect, is more likely to be the cause of our findings.

Nevertheless, to further address the concern, we examine whether the increase in perk consumption and tunneling is actually driven by performance decline during the financial crisis. Table 9 presents the results. In column (1), we repeat the regression in column (2) of Table 5 but add an additional interaction variable, D_CSOE×After2008. The interaction variable captures the DiD of CEO compensation between CSOEs and non-CSOEs before and after the 2008 financial crisis. The coefficient estimate is negative but insignificant, whereas the coefficient estimate on D_CSOE×After2009 remains negative and significant. These results indicate that the 2008 financial crisis is not likely to be the main cause of the CEO pay drop in CSOEs. In the next column, we partition CSOEs into two groups by the median of performance change before and after the crisis of 2008. We use ROS as a performance measure. Unsurprisingly, we find that CEO pay drops more for CSOEs whose performance declines more. In columns (3) and (4), we repeat the analysis of columns (1) and (2) but replace the dependent variable with perk consumption. In column (3), the coefficient estimate for D_CSOE×After2008 is negative and insignificant, whereas the coefficient estimate for D_CSOE×After2009 is significantly positive. More importantly, we find no difference in perk consumption between the two groups of CSOEs partitioned by performance change around the crisis. This finding suggests that the performance decline of CSOEs after the crisis did not drive the CEOs of these firms to consume more perks. In columns (5) and (6), we examine the effect of the crisis on tunneling. In column (5), we find a positive but insignificant coefficient estimate for D_CSOE×After2008, whereas the coefficient estimate for D_CSOE×After2009 is significantly positive. If crisis-caused performance drops incentivize managers to tunnel more firm resources, we would expect to see a more significant increase for the CSOEs with poorer performance (i.e., more significant increase for Performance_Low×After2008 than for Performance_High×After2008). The results in column (6) do not support such a prediction. We find no statistical difference in the extent of tunneling between the two groups of CSOEs. If anything, the coefficient estimate for Performance_High×After2008 is statistically significant, whereas that for Performance_Low×After2008 is not.

5.2. Test of the parallel trend assumption

The key assumption for consistency of the DiD estimator is that in the absence of treatment (pay regulation), the average change in the outcome variable would have been the same for both the treatment (CSOEs) and control (non-CSOEs) groups, which is often called the parallel trend assumption (Roberts and Whited 2013). In other words, trends in the outcome variables for CSOEs and non-CSOEs should be the same prior to pay regulation but diverge after the regulation.

In this subsection, we perform a formal test for parallel trends using the following regression specification during the pre-regulation period:

$$Outcome\ \ variable = \beta_1 D\_CSOE \times Year + \beta_2 Year + \beta_k Control\,variables + Firm\,FE + \varepsilon. \quad (2)$$

By regressing the outcome variables on the time variable and its interaction with the CSOE dummy, the coefficient on the interaction should capture the difference in the pre-regulation trends of the outcome variables between CSOEs and non-CSOEs, if any.

Table 10 presents the results. Control variables are included but their coefficient estimates are not presented for brevity. Panel A shows the results using the entire sample period before pay regulation (2005–2009), whereas Panel B uses three years prior (2007–2009) as the pre-regulation sample period. In Panel A, we find the coefficient estimates on D_CSOE×Year are not significant in columns (1) through (3). In column (4), the outcome variable is ROS and the coefficient on D_CSOE×Year is negative and significant at the 5% level, suggesting caution in interpreting the results for firm performance. In Panel B, none of the coefficient estimates on D_CSOE×Year are significant. The results in Table 10 suggest that the parallel trend assumption is generally satisfied in our sample.

5.3. Alternative control sample

Although our experimental setting uses DiD to sort out the effect of pay restriction on the outcome variables, an additional concern is that some omitted time-varying variables may have differentially affected the post-treatment trends of CSOEs and non-CSOEs, in which case our findings suffer from endogeneity bias. To mitigate such concern, we use only LSOEs as the control sample as opposed to using

all non-CSOEs, which includes both LSOEs and non-SOEs. This helps ensure that our results are not driven by unobservable differences between CSOEs and non-CSOEs, as CSOEs and LSOEs are more similar to each other than to non-SOE firms. We repeat the tests in Tables 5, 6, 7, and 8 and find that the results remain unchanged. The results are available in the Internet Appendix.

5.4. Controlling for additional fixed effects

We also repeat the tests in Tables 5, 6, 7, and 8 controlling for firm-characteristic-by-year fixed effects in addition to firm fixed effects. We use two firm characteristic variables, industry and firm size. In each year, we divide the sample into five groups by total assets, which results in 55 year-size groups (5 × 11 years). As for industry-year groups, there are 66 industry-year groups with six industries (commerce, finance, public utilities, properties, manufacturing, and conglomerates) as classified by CSRC industry classification. We find similar results with industry-year or size-year fixed effects controlled. The results are available in the Internet Appendix.

5.5. Top three executive compensation as a measure of compensation

Because the pay regulation of 2009 applies to all top executives, not just CEOs, as a robustness test, we use the average compensation of the three most highly paid executives (top three executives) and repeat the tests of the previous sections. In most companies, the most highly paid executives are the general manager (CEO), vice general manager, chief financial officer, chairman of the board, and chairman of the supervisory board. We repeat the main tests in Tables 5, 6, 7, and 8 using the compensation of the top three executives and find consistent results. The results are available in the Internet Appendix.

5.6. Entertainment and travel costs as a proxy for perk consumption

Cai, Fang, and Xu (2011) note that "accounting practice in China is sufficiently lax that managers may be reimbursed for almost any kind of entertainment and travel for any purpose, often with fake or inflated receipts" (p. 61). In their study of anti-corruption reforms and shareholder valuation, Lin, Morck, Yeung,

and Zhao (2017) argue that entertainment and travel costs (ETC) from SOEs mainly fund private benefits. Although our measure of perks includes ETC, given previous studies, ETC may serve to better capture the extent of private benefits. However, when we repeat the analysis in Table 6, we obtain practically the same results. We report the results in the Internet Appendix.

5.7. Related-party transactions as a measure of tunneling

Ideally, we seek to measure the portion of net other receivables associated with related parties to proxy for tunneling. Using the "Related Party Relationships and Business Transactions" category in annual reports, Bailey, Huang, and Yang (2011) collect information on "other accounts receivable" in their study of loan decisions by state-controlled banks. This variable reflects the cash amount owed by related parties that is not associated with the sale of goods, which should better capture the extent of expropriation or tunneling. We sum up the balance of "other accounts receivable" items with related parties for each firm-year and use its logarithm as a proxy for tunneling. The disadvantage of using this variable is that the data are missing for some firms. Nevertheless, when we repeat the tests in Table 7, we find similar results. We report the results in the Internet Appendix.

5.8. Exclusion of financial firms from the sample

As financial firms have substantially different characteristics from industrial firms, we examine whether the results are affected by such firms. We exclude financial firms from the sample and repeat the tests in Tables 5, 6, 7, and 8. Financial firms comprise 1.63% of the sample and 2.57% of the subsample with perks data. We find that the results remain similar after excluding financial firms. The results are available in the Internet Appendix.

5.9. CEO turnover

We show that pay restriction imposed significant financial losses on affected managers. One may argue that pay restriction may not be binding given that managers can move to other firms that are not affected

by the regulation and which offer generous pay. Institutional factors in China make this argument unlikely to be true. First, incentives for political promotion are as important as monetary incentives for managers of CSOEs (Cao, Lemmon, Pan, Qian, and Tian 2018). For CEOs who are concerned with political promotion, monetary losses alone may not provide enough incentive to leave for non-CSOE enterprises. Second, it is unlikely that the managerial labor market in China is so well developed that managers have viable outside employment options. If it were, we should see an increase in voluntary turnover following the pay regulation. We find that this is not the case. When we examine CEO turnover by year during our sample period, we find no abnormal increase in turnover for managers of CSOEs following the pay regulation except for a big increase in 2013, which was due to the anti-corruption campaign that started in late 2012. The univariate DiD test on CEO turnover between CSOEs and non-CSOEs before and after implementation of the pay regulation shows no significant change in turnover behavior. The results are available in the Internet Appendix.

6. Conclusion

The aftermath of the 2008 financial crisis sparked an intense debate over executive compensation among politicians, investors, regulators, and the public. There are two essential issues in this debate: whether CEO compensation is excessive, and whether CEO pay should be restricted. The second issue warrants investigation regardless of the findings of the first. If CEO pay is not excessive, any restriction of it will lead to suboptimal results. However, even if CEO pay is excessive, a pay restriction regulation may not achieve its intended objectives but instead produce unintended consequences. Using the executive pay regulation the Chinese government imposed on CSOEs in 2009, we find that limiting CEO pay backfires because CEOs respond by consuming more perks and tunneling more firm resources, which in turn destroys firm performance. Rent-seeking behavior is ubiquitous and, arguably, particularly acute in China. Properly designed CEO compensation can better align the interests of shareholders and managers so that managers have less incentive to engage in rent-seeking. Our findings provide evidence that cutting CEO compensation may induce more rent-seeking behavior, at least in the Chinese setting.

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Appendix 1. Variable definitions

Variable	Definition
CEO compensation	Total annual cash compensation (basic salary plus bonus) of CEO, adjusted to 2010 CNY.
Perks	Sum of expenses for travel, business entertainment, overseas training, board meetings, company cars, and meetings from "Cash Payment for Expenses Related to Operating Activity" section of financial statement footnotes, adjusted to 2010 CNY.
Number of paid executives	Number of executives with nonzero cash compensation.
Net other receivables	Balance on net other receivables.
Return on assets (ROA)	Operating profits over total assets.
Return on sales (ROS)	Operating profits over total sales.
Total assets	Total assets.
Total sales	Total sales.
Market capitalization	Market value of shares outstanding.
Market to book ratio	Market capitalization over book value of total shareholder equity.
Total wages	Total compensation paid to employees, adjusted to 2010 CNY.
CEO age	Age of CEO.
Female CEO	Dummy variable equal to one if a CEO is female and zero otherwise.
CEO duality	Dummy variable equal to one if a CEO is also the chairman of the same firm and zero otherwise.
Block ownership	Percentage of control rights owned by the ultimate controlling shareholder.
Control-ownership wedge	The control rights of the ultimate controlling shareholder minus its cash-flow rights.
Tangibility	Net fixed assets over total assets.
Sales growth	Changes in total sales over lagged total sales.
Leverage	Total liabilities over total assets.
Tax rate	Income tax expenses over total assets.
CSOE	Centrally administered state-owned enterprises whose ultimate controlling shareholder is the State-Owned Assets Supervision and Administration Commission of the State Council (SASAC).
LSOE	Local state-owned enterprises whose ultimate controlling shareholder is the State-Owned Assets Supervision and Administration Commission of a local government.

D_CSOE	Dummy variable equal to one for CSOEs and zero otherwise.
After2008	Dummy variable equal to one for years after 2008 (i.e., years 2009–2015) and zero otherwise.
After2009	Dummy variable equal to one for years after 2009 (i.e., years 2010–2015) and zero otherwise.
After2012	Dummy variable equal to one for years after 2012 (i.e., years 2013–2015) and zero otherwise.
Pay_Cut_High	Dummy variable equal to one for CSOEs whose pay change is below the median of CSOE pay changes after the regulation and zero otherwise.
Pay_Cut_Low	Dummy variable equal to one for CSOEs whose pay change is above the median of CSOE pay changes after the regulation and zero otherwise.
Performance_High	Dummy variable equal to one for CSOEs whose performance change is above the median CSOE performance change after the 2008 financial crisis and zero otherwise.
Performance_Low	Dummy variable equal to one for CSOEs whose performance change is below the median CSOE performance change after the 2008 financial crisis and zero otherwise.

Figure 1. Time variation in outcome variables

This figure presents the medians of CEO compensation, perk consumption, tunneling, and firm performance by year and firm type (CSOE, LSOE, and non-SOE). All variables are defined in Appendix 1.

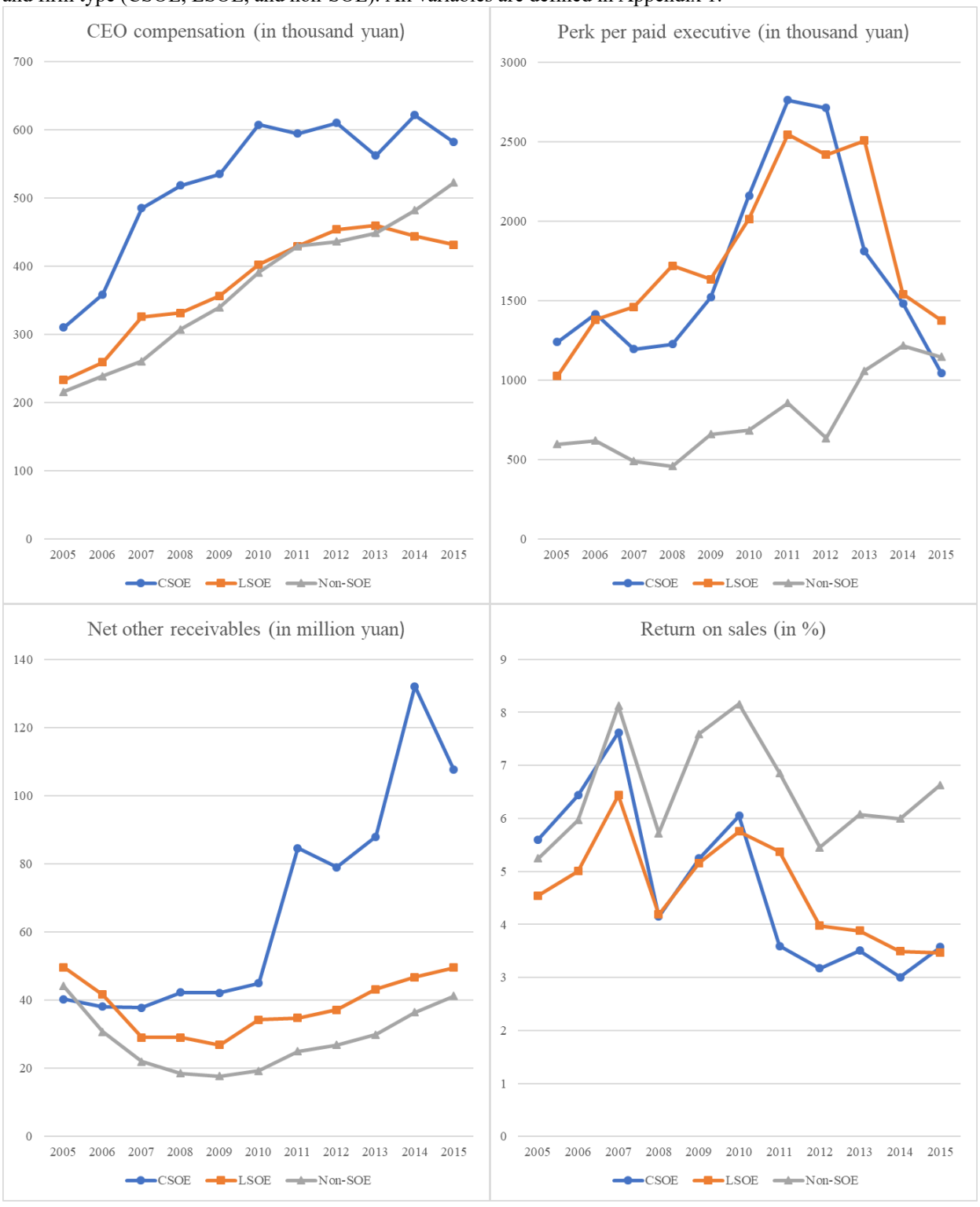

Table 1. Sample composition

This table presents the distribution of sample firms by year and firm type (CSOE and non-CSOE) for the full sample and the subsample with perk data available. All data are obtained from the China Securities Market and Accounting Research (CSMAR) database except perk data, which are hand-collected from financial statement footnotes. All variables are defined in Appendix 1.

Year	All sample firms		Firms with perk data	
	CSOE	Non-CSOE	CSOE	Matched non-CSOE
2005	67	712	26	26
2006	80	872	35	36
2007	94	1024	40	48
2008	99	1144	42	58
2009	95	1119	35	55
2010	95	1122	30	49
2011	94	1116	31	44
2012	95	1103	32	44
2013	93	1096	24	41
2014	92	1076	24	40
2015	89	1044	21	36
Number of observations	993	11428	340	477
Number of unique firms	102	1212	57	75

Table 2. Summary statistics

This table presents the summary statistics for firm characteristics, CEO compensation and characteristics, perk consumption, tunneling, and firm performance. All variables are defined in Appendix 1.

Variables	All firms			CSOEs			Non-CSOEs		
	N	Mean	Median	N	Mean	Median	N	Mean	Median
Panel A: Firm characteristics									
Total assets (in millions)	12421	25160	2764	993	155824	6320	11428	13806	2641
Total sales (in millions)	12421	6575	1579	993	23938	4185	11428	5067	1474
Market capitalization (in millions)	12421	9658	3777	993	30463	6954	11428	7850	3617
Market to book ratio	12421	3.831	2.728	993	3.214	2.410	11428	3.885	2.757
Total wages (in millions)	12421	442	123	993	1766	369	11428	327	113
Block ownership (%)	11935	37.417	35.860	937	47.288	48.820	10998	36.576	34.540
Control-ownership wedge (%)	11914	6.190	0.000	936	4.771	0.000	10978	6.311	0.411
Tangibility	12421	0.261	0.231	993	0.259	0.200	11428	0.261	0.232
Sales growth	12219	0.199	0.108	985	0.207	0.140	11234	0.199	0.106
Leverage	12421	0.502	0.510	993	0.553	0.579	11428	0.498	0.505
Tax rate	12336	0.010	0.007	990	0.009	0.006	11346	0.010	0.007
Panel B: CEO compensation and characteristics									
CEO compensation	12421	542479	378338	993	642538	531293	11428	533785	365630
CEO age	12421	48	47	993	49	49	11428	48	47
Female CEO	12421	0.058	0	993	0.010	0	11428	0.062	0
CEO duality	12421	0.165	0	993	0.056	0	11428	0.174	0
Panel C: Perk consumption									
Perks (in thousands) [A]	817	67092	20700	340	114224	24929	477	33497	17250
Number of paid executives [B]	817	15	14	340	15	14	477	15	15
A / B	817	4127	1383	340	6893	1703	477	2155	1264
Perks / sales (%)	817	1.142	0.672	340	1.151	0.676	477	1.136	0.659
Perks / assets (%)	817	0.784	0.497	340	0.777	0.471	477	0.789	0.518
Panel D: Proxy variable for tunneling									

Net other receivables (in thousands)	12294	161649	32458	967	637311	64853	11327	121041	30855
Net other receivables / assets (%)	12294	2.569	1.070	967	1.888	0.947	11327	2.627	1.086
Panel E: Firm performance									
ROS (%)	12421	6.802	5.627	993	6.394	4.513	11428	6.837	5.768
ROA (%)	12421	3.789	3.333	993	3.623	3.072	11428	3.804	3.350

Table 3. Time variation in outcome variables

This table presents the medians of CEO compensation, perk consumption, tunneling, and firm performance by year and firm type. All variables are defined in Appendix 1.

	CEO compensation (in thousand yuan)			Perks per paid executive (in thousand yuan)			Net other receivables (in million yuan)			Return on sales (in %)		
Year	CSOE	LSOE	Non-SOE	CSOE	LSOE	Non-SOE	CSOE	LSOE	Non-SOE	CSOE	LSOE	Non-SOE
2005	310.3	233.2	215.9	1241.0	1027.0	597.9	40.28	49.68	44.09	5.60	4.54	5.24
2006	358.4	259.4	238.9	1417.1	1381.3	620.1	38.15	41.59	30.70	6.44	5.00	5.97
2007	484.9	325.8	260.9	1195.6	1460.0	491.7	37.76	29.00	21.92	7.62	6.43	8.12
2008	518.6	331.4	307.8	1227.5	1719.8	460.0	42.24	29.09	18.52	4.15	4.19	5.72
2009	535.2	356.4	340.1	1522.0	1634.5	661.3	42.15	26.89	17.74	5.25	5.16	7.60
2010	607.6	402.2	391.0	2161.0	2015.1	685.2	44.96	34.20	19.22	6.05	5.76	8.16
2011	594.2	429.5	429.4	2762.3	2544.9	856.5	84.67	34.79	24.95	3.59	5.38	6.86
2012	609.9	453.9	436.0	2712.7	2416.8	635.6	78.96	37.16	26.84	3.17	3.98	5.45
2013	562.1	459.4	448.7	1810.3	2506.2	1059.1	87.93	43.17	29.88	3.50	3.88	6.08
2014	621.7	443.9	482.0	1482.6	1542.4	1218.9	132.11	46.70	36.43	3.01	3.50	5.99
2015	582.0	431.4	522.3	1046.0	1376.9	1146.7	107.60	49.58	41.23	3.58	3.46	6.63

Table 4. Univariate difference-in-differences (DiD) tests

This table shows the results of the univariate DiD tests for the variables CEO compensation, perks, tunneling, and firm performance. Abnormal figures are the residuals from regressing the variables of interest on firm and year fixed effects. For each variable, we calculate firm-level means before and after regulation (during the periods 2005–2009 and 2010–2015) and then conduct DiD tests. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variables		(1) Before regulation	(2) After regulation	(3) Difference
Panel A: Raw figures				
Log(CEO compensation)	CSOE	12.975	13.232	0.256***
	Non-CSOE	12.531	12.957	0.426***
	Difference	0.444***	0.275***	-0.169***
Log(perks / number of paid executives)	CSOE	14.311	15.028	0.569***
	Non-CSOE	13.867	14.170	0.324***
	Difference	-0.444*	-0.859***	0.245**
Log(net other receivables)	CSOE	17.713	18.333	0.620***
	Non-CSOE	17.004	17.261	0.263***
	Difference	-0.708***	-1.071***	0.357***
Return on sales (%)	CSOE	8.336	4.941	-3.395***
	Non-CSOE	6.338	6.886	0.548
	Difference	1.999	-1.944	-3.943**
Panel B: Residual figures net of firm and year fixed effects				
Abnormal log(CEO compensation)	CSOE	0.095	-0.067	-0.162***
	Non-CSOE	-0.012	0.004	0.015
	Difference	0.106***	-0.071***	-0.177***
Abnormal log(perks / number of paid executives)	CSOE	-0.025	0.064	0.103
	Non-CSOE	0.049	-0.054	-0.113
	Difference	0.074	-0.118**	0.216*
Abnormal log(net other receivables)	CSOE	-0.157	0.132	0.289***
	Non-CSOE	0.026	-0.042	-0.069*
	Difference	0.184**	-0.174***	0.358***
Abnormal return on sales (%)	CSOE	1.841	-1.392	-3.233***
	Non-CSOE	-0.336	0.296	0.632
	Difference	2.177**	-1.688**	-3.865**

Table 5. Effect of pay regulation on CEO compensation

This table presents the regression results for the effect of pay regulation on CEO compensation. The dependent variable is the logarithm of CEO compensation. Column (4) excludes firms that are dual-listed on the Hong Kong Stock Exchange. All regressions include firm and year fixed effects. Standard errors are clustered at the firm and year levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variables	(1)	(2)	(3)	(4)
D_CSOE×After2009		-0.177***	-0.132**	-0.138**
		(-3.206)	(-2.736)	(-2.329)
D_CSOE×After2012			-0.093*	
			(-1.923)	
CEO age	0.011***	0.011***	0.011***	0.011***
	(4.598)	(4.615)	(4.604)	(4.905)
Female CEO	-0.013	-0.013	-0.012	-0.010
	(-0.211)	(-0.207)	(-0.190)	(-0.164)
CEO duality	0.070	0.068	0.068	0.069
	(1.750)	(1.707)	(1.687)	(1.735)
Log(total assets)	0.207***	0.209***	0.208***	0.207***
	(8.734)	(8.931)	(8.969)	(8.760)
Return on sales	0.413***	0.406***	0.406***	0.395***
	(7.764)	(7.778)	(7.798)	(7.595)
Market to book ratio	0.007*	0.007*	0.007*	0.006*
	(1.949)	(1.925)	(1.956)	(1.831)
Number of observations	12421	12421	12421	12058
Adjusted R^2	0.670	0.670	0.670	0.666
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Table 6. Effect of pay regulation on perk consumption

This table presents the regression results for the effect of pay regulation on perk consumption. The dependent variable is the logarithm of perk consumption scaled by the number of paid executives. The sample period is 2005–2012 in column (5) and 2005–2015 in all other columns. All regressions include firm and year fixed effects. Standard errors are clustered at the firm and year levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variables	(1)	(2)	(3)	(4)	(5)
D_CSOE×After2009		0.200**	0.249***		
		(2.376)	(3.431)		
D_CSOE×After2012			-0.121		
			(-1.190)		
Pay_Cut_High×After2009				0.281**	0.324**
				(2.910)	(3.254)
Pay_Cut_Low×After2009				0.133	0.211*
				(1.250)	(2.311)
Log(total assets)	0.362***	0.357***	0.356***	0.359***	0.246**
	(3.756)	(3.624)	(3.647)	(3.653)	(2.480)
Log(total wages)	0.335***	0.343***	0.343***	0.347***	0.364***
	(3.402)	(3.544)	(3.591)	(3.599)	(3.582)
Number of observations	817	817	817	817	630
Adjusted R^2	0.902	0.903	0.903	0.903	0.916
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes

Table 7. Effect of pay regulation on tunneling

This table presents the regression results for the effect of pay regulation on tunneling. The dependent variable is the logarithm of net other receivables. The sample period is 2005–2012 in column (5) and 2005–2015 in all other columns. All regressions include firm and year fixed effects. Standard errors are clustered at the firm and year levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variables	(1)	(2)	(3)	(4)	(5)
D_CSOE×After2009		0.233**	0.209*		
		(2.641)	(2.033)		
D_CSOE×After2012			0.051		
			(0.640)		
Pay_Cut_High×After2009				0.314**	0.333**
				(2.753)	(2.693)
Pay_Cut_Low×After2009				0.141	0.019
				(1.347)	(0.162)
Log(total assets)	0.946***	0.943***	0.943***	0.943***	1.015***
	(15.666)	(15.690)	(15.684)	(15.708)	(15.585)
Return on sales	-0.587***	-0.581***	-0.581***	-0.580***	-0.554**
	(-3.429)	(-3.418)	(-3.422)	(-3.421)	(-2.552)
Block ownership	-0.003	-0.003	-0.003	-0.003	-0.003
	(-1.650)	(-1.676)	(-1.676)	(-1.683)	(-1.150)
Control-ownership wedge	-0.002	-0.003	-0.003	-0.003	0.005
	(-0.501)	(-0.551)	(-0.553)	(-0.546)	(1.083)
Tangibility	-0.867***	-0.882***	-0.883***	-0.880***	-0.814**
	(-4.419)	(-4.476)	(-4.487)	(-4.465)	(-3.421)
Sales growth	-0.015	-0.013	-0.013	-0.013	-0.023
	(-0.616)	(-0.555)	(-0.550)	(-0.551)	(-1.019)
Leverage	0.719***	0.707***	0.706***	0.708***	0.669***
	(5.255)	(5.152)	(5.153)	(5.152)	(3.615)
Tax rate	-5.501**	-5.543**	-5.541**	-5.480**	-3.355
	(-2.254)	(-2.280)	(-2.279)	(-2.265)	(-1.219)
Number of observations	11541	11541	11541	11541	8177
Adjusted R^2	0.756	0.756	0.756	0.756	0.770
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes

Table 8. Effect of pay regulation on firm performance

This table presents the regression results for the effect of pay regulation on firm performance. The dependent variables are ROS in columns (1) to (3) and ROA in columns (4) to (6). All regressions include firm and year fixed effects. Standard errors are clustered at the firm and year levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variables	ROS (%)			ROA (%)		
	(1)	(2)	(3)	(4)	(5)	(6)
D_CSOE×After2009	-3.850**	-4.246**		-1.151*	-1.162	
	(-2.480)	(-2.490)		(-1.853)	(-1.733)	
D_CSOE×After2012		0.813			0.022	
		(0.619)			(0.042)	
Pay_Cut_High×After2009			-5.388**			-2.192**
			(-3.069)			(-2.713)
Pay_Cut_Low×After2009			-2.296			-0.100
			(-1.142)			(-0.123)
Log(total assets)	2.995***	2.996***	3.004***	0.311	0.311	0.317
	(3.945)	(3.947)	(3.960)	(0.958)	(0.958)	(0.982)
Number of observations	12421	12421	12421	12421	12421	12421
Adjusted R^2	0.419	0.419	0.419	0.467	0.467	0.468
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 9. Effect of financial crisis on CEO compensation, perks, and tunneling

This table presents the regression results for the effect of the 2008 financial crisis on CEO compensation, perks, and tunneling. The dependent variables are the logarithm of CEO compensation in columns (1) and (2), the logarithm of perks scaled by the number of paid executives in columns (3) and (4), and the logarithm of net other receivables in columns (5) and (6). All regressions include firm and year fixed effects. Standard errors are clustered at the firm and year levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variables	Log(CEO compensation)		Log(perks / number of paid executives)		Log(net other receivables)	
	(1)	(2)	(3)	(4)	(5)	(6)
D_CSOE×After2008	-0.011		-0.016		0.093	
	(-0.308)		(-0.237)		(1.629)	
D_CSOE×After2009	-0.168***		0.211**		0.162**	
	(-4.282)		(3.008)		(2.580)	
Performance_High×After2008		-0.044		0.147		0.252**
		(-0.585)		(1.236)		(2.327)
Performance_Low×After2008		-0.260**		0.155		0.210
		(-3.060)		(1.648)		(1.588)
CEO age	0.011***	0.011***				
	(4.612)	(4.575)				
Female CEO	-0.013	-0.014				
	(-0.207)	(-0.218)				
CEO duality	0.068	0.069				
	(1.706)	(1.726)				
Log(total assets)	0.209***	0.208***	0.358***	0.356***	0.943***	0.943***
	(8.928)	(8.884)	(3.599)	(3.672)	(15.690)	(15.718)
Return on sales	0.406***	0.399***			-0.580***	-0.581***
	(7.781)	(7.812)			(-3.414)	(-3.414)
Market to book ratio	0.007*	0.007*				
	(1.928)	(1.885)				
Log(total wages)			0.343***	0.340***		
			(3.527)	(3.539)		
Block ownership					-0.003	-0.003
					(-1.677)	(-1.667)

Control-ownership wedge					-0.003 (-0.554)	-0.003 (-0.554)
Tangibility					-0.882*** (-4.473)	-0.878*** (-4.420)
Sales growth					-0.013 (-0.560)	-0.014 (-0.580)
Leverage					0.706*** (5.154)	0.709*** (5.167)
Tax rate					-5.534** (-2.276)	-5.534** (-2.262)
Number of observations	12421	12421	817	817	11541	11541
Adjusted R^2	0.670	0.670	0.903	0.902	0.756	0.756
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 10. Tests of the parallel trend assumption

This table presents the regression results for the test of the parallel trend assumption. The dependent variables are the logarithm of CEO compensation in column (1), the logarithm of perks scaled by the number of paid executives in column (2), the logarithm of net other receivables in column (3), and ROS in column (4). All regressions include control variables and firm fixed effects. The sample period is 2005–2009 in Panel A and 2007–2009 in Panel B. Standard errors are clustered at the firm and year levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variables	(1) Log(CEO compensation)	(2) Log(perks / number of paid executives)	(3) Log(net other receivables)	(4) ROS (%)
Panel A. Sample period: 2005-2009				
D_CSOE×Year	-0.004 (-0.165)	0.050 (1.373)	0.048 (1.365)	-1.622** (-4.554)
Year	0.086*** (7.315)	-0.010 (-0.336)	-0.217*** (-14.077)	-0.733 (-1.046)
Panel B. Sample period: 2007-2009				
D_CSOE×Year	-0.041 (-1.057)	-0.009 (-0.169)	0.027 (0.570)	-1.207 (-1.884)
Year	0.062** (5.937)	-0.017 (-0.390)	-0.160** (-6.089)	-2.427 (-2.664)
Controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes

Restricting CEO Pay Backfires: Evidence from China

Internet Appendix

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Summary

The Internet Appendix reports additional results from the robustness tests in Section 5. Table IA1 reports the results after excluding non-SOE firms from the sample (Section 5.3). Table IA2 reports the results controlling for industry-year fixed effects. Table IA3 reports the results controlling for size-year fixed effects (Section 5.4). Table IA4 reports the results using top three executive compensation as a measure of compensation (Section 5.5). Table IA5 presents the results using ETC as a proxy for perk consumption (Section 5.6). Table IA6 uses related-party transactions as a measure of tunneling (Section 5.7). Table IA7 reports the results after excluding financial firms from the sample (Section 5.8). Table IA8 reports the results for CEO turnover (Section 5.9).

Table IA1. Results excluding non-SOE firms from the sample

This table presents the regression results after excluding non-SOE firms from the sample. The dependent variable is the logarithm of CEO compensation in columns (1) and (2), the logarithm of perks scaled by the number of paid executives in columns (3)-(5), the logarithm of net other receivables in columns (6)-(8), and ROS in columns (9)-(11). All regressions include firm and year fixed effects. Standard errors are clustered at the firm and year levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Log(CEO compensation)		Log(perks / number of paid executives)			Log(net other receivables)			ROS (%)		
D_CSOE×After2009	-0.118**	-0.096*	0.259**	0.247**		0.191*	0.174		-2.757*	-3.403**	
	(-2.285)	(-2.105)	(2.648)	(2.606)		(2.024)	(1.741)		(-2.036)	(-2.386)	
D_CSOE×After2012		-0.046		0.029			0.035			1.330	
		(-0.956)		(0.236)			(0.497)			(1.026)	
Pay_Cut_High×After 2009					0.342***			0.273**			-4.217**
					(3.280)			(2.293)			(-2.876)
Pay_Cut_Low×After 2009					0.193			0.098			-1.285
					(1.617)			(0.898)			(-0.665)
CEO age	0.011***	0.011***									
	(3.688)	(3.675)									
Female CEO	-0.067	-0.066									
	(-1.054)	(-1.041)									
CEO duality	0.027	0.026									
	(0.577)	(0.557)									
Log(total assets)	0.120**	0.121**	0.365**	0.366**	0.369**	0.952***	0.952***	0.951***	1.313	1.305	1.343
	(2.860)	(2.873)	(3.036)	(3.036)	(3.064)	(16.072)	(16.053)	(16.084)	(1.199)	(1.194)	(1.232)
Return on sales	0.858***	0.859***				-0.559*	-0.560*	-0.558*			
	(7.664)	(7.682)				(-1.863)	(-1.869)	(-1.862)			
Market to book ratio	0.012**	0.012**									
	(2.426)	(2.431)									
Log(total wages)			0.338**	0.338**	0.344***						
			(3.123)	(3.102)	(3.177)						
Block ownership						-0.001	-0.001	-0.001			
						(-0.267)	(-0.263)	(-0.273)			

Control-ownership wedge						0.001 (0.261)	0.001 (0.258)	0.001 (0.278)			
Tangibility						-0.941** (-3.084)	-0.942** (-3.090)	-0.936** (-3.067)			
Sales growth						0.017 (0.489)	0.017 (0.493)	0.017 (0.497)			
Leverage						0.791** (2.857)	0.789** (2.857)	0.793** (2.861)			
Tax rate						-5.551 (-1.681)	-5.555 (-1.683)	-5.384 (-1.638)			
Observations	5063	5063	562	562	562	4688	4688	4688	5063	5063	5063
Adjusted R^2	0.629	0.629	0.899	0.899	0.899	0.796	0.796	0.796	0.557	0.557	0.557
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table IA2. Results with industry-year fixed effects

This table presents the regression results controlling for industry-year fixed effects. Firms are grouped into six industries (commerce, finance, public utilities, properties, manufacturing, and conglomerates) as classified by CSRC industry classification, which results in 66 industry-year groups (6 × 11 years). The dependent variable is the logarithm of CEO compensation in columns (1) and (2), the logarithm of perks scaled by the number of paid executives in columns (3)-(5), the logarithm of net other receivables in columns (6)-(8), and ROS in columns (9)-(11). All regressions include firm effects. Standard errors are clustered at the firm and year levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Log(CEO compensation)		Log(perks / number of paid executives)			Log(net other receivables)			ROS (%)		
D_CSOE×After2009	-0.160**	-0.115**	0.209**	0.248***		0.220**	0.202*		-3.727**	-3.880**	
	(-3.008)	(-2.553)	(2.523)	(3.421)		(2.496)	(1.971)		(-2.510)	(-2.404)	
D_CSOE×After2012		-0.092*		-0.096			0.037			0.314	
		(-1.933)		(-0.933)			(0.480)			(0.245)	
Pay_Cut_High×After 2009					0.294**			0.304**			-5.403**
					(3.061)			(2.642)			(-3.110)
Pay_Cut_Low×After 2009					0.141			0.126			-2.056
					(1.321)			(1.187)			(-1.049)
CEO age	0.011***	0.011***									
	(4.816)	(4.800)									
Female CEO	-0.026	-0.025									
	(-0.422)	(-0.402)									
CEO duality	0.068	0.067									
	(1.703)	(1.684)									
Log(total assets)	0.209***	0.208***	0.362***	0.361***	0.364***	0.943***	0.943***	0.942***	2.717***	2.718***	2.725***
	(8.990)	(9.038)	(3.509)	(3.526)	(3.537)	(15.289)	(15.287)	(15.305)	(3.410)	(3.413)	(3.425)
Return on sales	0.412***	0.412***				-0.574***	-0.574***	-0.574***			
	(7.896)	(7.913)				(-3.379)	(-3.382)	(-3.381)			
Market to book ratio	0.006*	0.006**									
	(2.219)	(2.237)									
Log(total wages)			0.289**	0.290**	0.292***						
			(3.099)	(3.131)	(3.172)						
Block ownership						-0.003	-0.003	-0.003			
						(-1.476)	(-1.476)	(-1.485)			

Control-ownership wedge						-0.003 (-0.623)	-0.003 (-0.624)	-0.003 (-0.617)			
Tangibility						-0.907*** (-4.511)	-0.907*** (-4.519)	-0.904*** (-4.498)			
Sales growth						-0.016 (-0.640)	-0.016 (-0.636)	-0.016 (-0.633)			
Leverage						0.727*** (5.279)	0.726*** (5.283)	0.727*** (5.275)			
Tax rate						-5.460** (-2.285)	-5.459** (-2.284)	-5.394** (-2.268)			
Observations	12421	12421	817	817	817	11541	11541	11541	12421	12421	12421
Adjusted R^2	0.672	0.672	0.899	0.899	0.899	0.756	0.756	0.756	0.424	0.424	0.425
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table IA3. Results with size-year fixed effects

This table presents the regression results controlling for size-year fixed effects. In each year, we divide the sample firms into five groups by total assets size, which results in 55 year-size groups (5 × 11 years). The dependent variable is the logarithm of CEO compensation in columns (1) and (2), the logarithm of perks scaled by the number of paid executives in columns (3)-(5), the logarithm of net other receivables in columns (6)-(8), and ROS in columns (9)-(11). All regressions include firm effects. Standard errors are clustered at the firm and year levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Log(CEO compensation)		Log(perks / number of paid executives)			Log(net other receivables)			ROS (%)		
D_CSOE×After2009	-0.150**	-0.114**	0.181**	0.220***		0.190**	0.162		-2.527	-3.033*	
	(-2.877)	(-2.496)	(2.480)	(3.466)		(2.313)	(1.708)		(-1.609)	(-1.847)	
D_CSOE×After2012		-0.075		-0.095			0.060			1.036	
		(-1.570)		(-0.986)			(0.767)			(0.841)	
Pay_Cut_High×After 2009					0.252***			0.255**			-3.716*
					(3.235)			(2.379)			(-2.139)
Pay_Cut_Low×After 2009					0.126			0.119			-1.349
					(1.260)			(1.118)			(-0.658)
CEO age	0.011***	0.011***									
	(4.701)	(4.688)									
Female CEO	-0.011	-0.010									
	(-0.179)	(-0.166)									
CEO duality	0.068	0.068									
	(1.708)	(1.693)									
Log(total assets)	0.252***	0.251***	0.653***	0.650***	0.651***	1.044***	1.045***	1.044***	2.801**	2.810**	2.816**
	(7.876)	(7.924)	(5.633)	(5.654)	(5.620)	(12.481)	(12.488)	(12.480)	(2.347)	(2.354)	(2.361)
Return on sales	0.399***	0.399***				-0.563***	-0.563***	-0.562***			
	(8.116)	(8.134)				(-3.374)	(-3.376)	(-3.376)			
Market to book ratio	0.006*	0.006*									
	(2.004)	(2.018)									
Log(total wages)			0.350***	0.349***	0.353***						
			(3.329)	(3.345)	(3.382)						
Block ownership						-0.003	-0.003	-0.003			
						(-1.692)	(-1.690)	(-1.697)			

Control-ownership wedge						-0.004 (-0.959)	-0.004 (-0.961)	-0.004 (-0.953)			
Tangibility						-0.882*** (-4.550)	-0.883*** (-4.556)	-0.880*** (-4.541)			
Sales growth						-0.008 (-0.349)	-0.008 (-0.347)	-0.008 (-0.348)			
Leverage						0.693*** (5.038)	0.692*** (5.037)	0.693*** (5.039)			
Tax rate						-5.481** (-2.356)	-5.485** (-2.360)	-5.433** (-2.341)			
Observations	12421	12421	817	817	817	11541	11541	11541	12421	12421	12421
Adjusted R^2	0.671	0.671	0.906	0.906	0.906	0.758	0.758	0.758	0.423	0.423	0.423
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Size × year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table IA4. Top three executive compensation as the measure of compensation

This table presents the results using top three executive compensation as the measure of compensation. The dependent variable is the logarithm of average compensation of the three highest paid executives in column (1), the logarithm of perks scaled by the number of paid executives in column (2), the logarithm of net other receivables in column (3), and ROS in column (4). All regressions include firm and year fixed effects. Standard errors are clustered at the firm and year levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variable	Log(top three compensation) (1)	Log(perks / number of paid executives) (2)	Log(net other receivables) (3)	ROS (%) (4)
D_CSOE×After2009	-0.115**			
	(-2.656)			
D_CSOE×After2012	-0.064*			
	(-2.038)			
Pay_Cut_High×After2009		0.311***	0.359**	-5.672**
		(3.452)	(3.152)	(-3.029)
Pay_Cut_Low×After2009		0.104	0.091	-2.006
		(0.913)	(0.782)	(-1.031)
Log(total assets)	0.249***	0.359***	0.942***	3.008***
	(13.612)	(3.696)	(15.696)	(3.972)
Return on sales	0.319***		-0.580***	
	(6.671)		(-3.416)	
Market to book ratio	0.007**			
	(2.258)			
Log(total wages)		0.351***		
		(3.700)		
Block ownership			-0.003	
			(-1.700)	
Control-ownership wedge			-0.003	
			(-0.551)	
Tangibility			-0.883***	
			(-4.483)	
Sales growth			-0.013	
			(-0.549)	
Leverage			0.709***	
			(5.161)	
Tax rate			-5.463**	
			(-2.263)	
Observations	12421	817	11541	12421
Adjusted R^2	0.810	0.904	0.756	0.419
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Table IA5. Entertainment and travel costs (ETC) as a measure of perk consumption

This table presents the regression results of the effect of pay regulation on perk consumption. The dependent variable is the logarithm of ETC scaled by the number of paid executives. The sample period is 2005–2012 in column (5) and 2005–2015 in all of the other columns. All regressions include firm and year fixed effects. Standard errors are clustered at the firm and year levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variable	Log(entertainment and travel costs / number of paid executives)				
	(1)	(2)	(3)	(4)	(5)
D_CSOE×After2009		0.189*	0.226**		
		(2.137)	(2.788)		
D_CSOE×After2012			-0.092		
			(-0.862)		
Pay_Cut_High×After2009				0.298**	0.322**
				(2.847)	(2.610)
Pay_Cut_Low×After2009				0.100	0.176
				(0.867)	(1.562)
Log(total assets)	0.429***	0.425***	0.424***	0.427***	0.306**
	(4.035)	(3.931)	(3.946)	(3.974)	(2.722)
Log(total wages)	0.332**	0.339***	0.339***	0.344***	0.359**
	(3.113)	(3.218)	(3.243)	(3.286)	(3.392)
Number of observations	817	817	817	817	630
Adjusted R^2	0.902	0.903	0.903	0.904	0.918
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes

Table IA6. Related-party transactions as a measure of tunneling

This table presents the regression results of the effect of pay regulation on tunneling. The dependent variable is the logarithm of the sum of other accounts receivables from the "Related Party Relationships and Business Transactions" section of firms' annual reports. The sample period is 2005–2012 in column (5) and 2005–2015 in all of the other columns. All regressions include firm and year fixed effects. Standard errors are clustered at the firm and year levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variable	Log (other accounts receivables)				
	(1)	(2)	(3)	(4)	(5)
D_CSOE×After2009		0.937**	0.693*		
		(2.888)	(1.868)		
D_CSOE×After2012			0.508		
			(1.445)		
Pay_Cut_High×After2009				1.070**	1.111*
				(2.663)	(2.328)
Pay_Cut_Low×After2009				0.794*	0.382
				(1.823)	(0.696)
Log(total assets)	0.688***	0.675***	0.676***	0.675***	0.649***
	(4.552)	(4.497)	(4.488)	(4.503)	(4.512)
Return on sales	-0.741	-0.714	-0.720	-0.714	-0.415
	(-1.568)	(-1.529)	(-1.543)	(-1.530)	(-0.687)
Block ownership	0.014	0.013	0.013	0.013	0.022*
	(1.456)	(1.435)	(1.437)	(1.434)	(2.217)
Control-ownership wedge	0.004	0.003	0.003	0.003	0.001
	(0.335)	(0.244)	(0.236)	(0.248)	(0.033)
Tangibility	-0.504	-0.572	-0.582	-0.568	-0.735
	(-1.012)	(-1.142)	(-1.166)	(-1.134)	(-1.341)
Sales growth	-0.040	-0.033	-0.033	-0.033	-0.081
	(-0.471)	(-0.393)	(-0.384)	(-0.391)	(-0.843)
Leverage	0.849*	0.799	0.787	0.799	0.365
	(1.920)	(1.796)	(1.774)	(1.799)	(0.808)
Tax rate	-15.079*	-15.265*	-15.271*	-15.158*	-7.000
	(-2.057)	(-2.083)	(-2.082)	(-2.075)	(-0.796)
Number of observations	10145	10145	10145	10145	7216
Adjusted R^2	0.457	0.457	0.457	0.457	0.483
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes

Table IA7. Results excluding financial firms from the sample

This table presents the regression results after excluding financial firms from the sample. The dependent variable is the logarithm of CEO compensation in columns (1) and (2), the logarithm of perks scaled by the number of paid executives in columns (3)-(5), the logarithm of net other receivables in columns (6)-(8), and ROS in columns (9)-(11). All regressions include firm and year fixed effects. Standard errors are clustered at the firm and year levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Log(CEO compensation)		Log(perks / number of paid executives)			Log(net other receivables)			ROS (%)		
D_CSOE×After2009	-0.163**	-0.129**	0.202**	0.245***		0.224**	0.195*		-3.969**	-4.347**	
	(-2.990)	(-2.589)	(2.380)	(3.281)		(2.483)	(1.852)		(-2.552)	(-2.544)	
D_CSOE×After2012		-0.071		-0.105			0.061			0.771	
		(-1.440)		(-1.014)			(0.751)			(0.575)	
Pay_Cut_High×After 2009					0.285**			0.304**			-5.834***
					(2.853)			(2.568)			(-3.303)
Pay_Cut_Low×After 2009					0.138			0.137			-2.195
					(1.291)			(1.303)			(-1.090)
CEO age	0.011***	0.011***									
	(4.807)	(4.793)									
Female CEO	-0.031	-0.030									
	(-0.478)	(-0.468)									
CEO duality	0.067	0.067									
	(1.753)	(1.736)									
Log(total assets)	0.213***	0.213***	0.357***	0.356***	0.359***	0.948***	0.948***	0.948***	2.767***	2.770***	2.776***
	(9.209)	(9.239)	(3.436)	(3.455)	(3.467)	(15.725)	(15.726)	(15.748)	(3.589)	(3.594)	(3.606)
Return on sales	0.412***	0.413***				-0.599***	-0.599***	-0.598***			
	(7.431)	(7.442)				(-3.425)	(-3.430)	(-3.427)			
Market to book ratio	0.007**	0.007**									
	(2.268)	(2.282)									
Log(total wages)			0.298***	0.299***	0.302***						
			(3.298)	(3.330)	(3.367)						
Block ownership						-0.003	-0.003	-0.003			
						(-1.590)	(-1.591)	(-1.598)			

Control-ownership wedge						-0.003 (-0.535)	-0.003 (-0.537)	-0.003 (-0.531)			
Tangibility						-0.884*** (-4.435)	-0.885*** (-4.447)	-0.882*** (-4.426)			
Sales growth						-0.014 (-0.580)	-0.014 (-0.574)	-0.014 (-0.575)			
Leverage						0.706*** (4.949)	0.705*** (4.951)	0.707*** (4.957)			
Tax rate						-5.450** (-2.231)	-5.447** (-2.230)	-5.389* (-2.218)			
Observations	12218	12218	796	796	796	11455	11455	11455	12218	12218	12218
Adjusted R^2	0.665	0.665	0.896	0.896	0.896	0.756	0.756	0.756	0.407	0.407	0.407
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table IA8. CEO turnover

Panel A: CEO turnover by year

This panel presents the CEO turnover rate by year and firm type. A CEO turnover is identified when the CEO name in the current year is different from the CEO name in the previous year. CEO turnover rate is the number of CEO turnovers identified in a given year over the number of companies in that year.

Year	CSOEs	Non-CSOEs
2005	0.122	0.114
2006	0.058	0.153
2007	0.119	0.197
2008	0.214	0.167
2009	0.170	0.161
2010	0.151	0.157
2011	0.167	0.170
2012	0.132	0.155
2013	0.289	0.169
2014	0.180	0.207
2015	0.230	0.221

Panel B: Univariate difference-in-differences (DiD) test on CEO turnover

This panel presents the result of the univariate DiD test on CEO turnover. The figures used in the tests are the average during the sub-periods 2005–2009 (before regulation) and 2010–2015 (after regulation). ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Before regulation	After regulation	Difference
CSOEs	0.143	0.191	0.048**
Non-CSOEs	0.170	0.181	0.011
Difference	0.027	-0.011	0.037