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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. Pay-performance sensitivity for these firms also significantly decreases. 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.

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Restricting CEO Pay Backfires: Evidence from China

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. Pay-performance sensitivity for these firms also significantly decreases. 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.

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1. Introduction

The aftermath of the 2008 financial crisis sparked intense debate over executive compensation, particularly on whether CEO pay should 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, empirical evidence on the pay regulations directly restricting CEO pay is scant mainly due to lack of such regulations. Extant studies on pay regulations are either theoretical[1] or investigate indirect pay regulations such as limiting tax deductibility of executive pay. Notable exceptions are Cadman, Carter, and Lynch (2012) and Abudy, Amiram, Rozenbaum, and Shust (2020). Cadman, Carter, and Lynch (2012) study whether pay restrictions associated with the Troubled Asset Relief Program (TARP) limiting executive pay to $500,000 influence banks' participation in the program, while Abudy, Amiram, Rozenbaum, and Shust (2020) conduct an event study of the passage of a law in Israel restricting executive pay of financial institutions to a binding upper limit. While both studies examine the effect of directly restricting CEO pay, the pay restrictions apply to financial institutions alone and little is known about the effect of restricting CEO pay on non-financial firms. Moreover, existing studies shed little light on how restrictions on CEO pay affect CEO incentives and behavior. In this paper, we fill the gap in the literature and investigate how CEO incentives and behavior change in response to the pay restrictions on a sample of firms covering a broad range of industries including financial industries.

We conduct our analysis in the context of China. In September 2009, the central government of China introduced a regulation of executive compensation for the country's centrally administered state-owned

[1] Theoretical studies analyze the pros and cons of executive pay regulations and find that pay restrictions may have unintended consequences while they may enhance efficiency and benefit shareholders under certain conditions (Dittmann, Maug, and Zhang 2011; Thanassoulis 2012; Cebon and Hermalin 2015).

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enterprises (CSOEs).[2] While the regulation was intended to provide comprehensive guidance on executive compensation of CSOEs, it served primarily to restrict executive compensation by capping the ratio of executive compensation to average employee salary in the company.[3] The policy restricts the basic salary of executives to five times the average employee salary and the bonus to three times the basic salary. The introduction of pay regulation in China provides an ideal setting to examine the effects of pay restriction on CEO behavior[4] because 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 incentives and behavior.[5]

We hypothesize that CEO pay restriction weakens incentives of CSOE CEOs to perform relative to those other CEOs because the restriction will inevitably make CEO pay of CSOEs less sensitive to firm performance, which will result in a decrease in CEO's pay-for-performance sensitivity (PPS) and eventually firm performance. We also hypothesize that CEO pay restriction will induce increased rent-seeking behavior by CSOE CEOs relative to other CEOs because they are more likely to extract rents from the companies to compensate for the restricted pay.

Using a sample of CSOEs and non-CSOEs during 2005–2015, we find a significant decrease in CEO pay of CSOEs. As the measure of CEO pay, we use basic salary plus bonus (cash compensation) but omit equity-based compensation, such as restricted stock and stock options, as very few firms have equity-based

[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-Owned Assets Supervision and Administration Commission of the State Council (SASAC). We discuss the institutional background of Chinese SOEs in section 2.

[3] Proponents of the pay regulation based on the ratio of CEO pay to the median pay of employees (hereafter pay gap ratio) 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). To our best knowledge, only Israel adopted such pay regulation by imposing a binding pay limit of 35 times the gross salary of the lowest-paid employee at the firm (or 44 times the lowest-paid employee's after-tax annual compensation) on financial institutions.

[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.

[5] We note that our study design does not provide data on conditions that would exist in a fully factorial experimental design. Specifically, it does not include data in a post-regulation world in which non-CSOEs are also affected or CSOEs would not be affected by the regulation.

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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 effectively reduces CEO compensation of CSOEs.

The decrease in CEO compensation level for CSOEs appears to be a result of the CEO compensation being capped to curb high compensation. Consistent with our hypothesis regarding the effect of pay restriction on CEO incentives, we find a significant drop in PPS for CSOEs following the pay regulation, supporting the view that the pay regulation reduces the CEOs' incentive to perform for CSOEs.

To test whether the pay restriction induces increased rent-seeking behavior by CSOE CEOs, 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 23% 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 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; Chen and Keefe 2020; Yang, Guariglia and Guo 2019; Firth, Lin, Wong and Zhao 2019). 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

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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 performance 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 started 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 implementation of the pay regulation in 2010. Second, we find that the PPS of CSOEs drops significantly following the pay regulation. If performance deterioration following the crisis was driving the pay cut, one should not observe a drop in the PPS. Third, when we partition CSOEs into two groups by their performance changes 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, and tunneling, using two alternative control samples (LSOEs and size-industry-matched non-CSOEs) and controlling for industry-year and size-year fixed effects (on top of firm fixed effects) and find robust results.

Our study adds to the growing literature on pay restriction. For instance, in an extensive survey study, Murphy and Jensen (2018) discuss various government regulations intended to affect executive pay and argue that they have largely brought in unintended consequences. While numerous studies examine the consequence of government regulations including disclosure requirements, tax laws, accounting rules, and governance

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reforms, they are in nature indirect and very few studies investigate the effect of directly limiting CEO pay due to lack of such regulation. Our research design 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 (2020) 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 (2020) 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.[6] 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.

We acknowledge that our findings using CSOEs in China 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 (2020). 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 SOEs and 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.

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

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2. State-owned enterprise and the 2009 pay regulation

2.1. State-owned enterprise

Chinese SOEs are enterprises with either central or local government as the biggest shareholder. The SOEs operate in almost all industries, vary in size, and are geographically dispersed. They are one of the most important players in the Chinese economy: SOEs account for over 60% of China's market capitalization in 2019[7]; they produce 40% of China's GDP of US$15.97 trillion (101.36 trillion yuan) in 2020[8]; and their combined assets amount to 259.3 trillion yuan (US$40.31 trillion) as of the end of 2021. Looking at the largest 136 Chinese companies from the Fortune Global 500 in 2022, 71% are SOEs and they represent 78% of the total revenue and 84% of the total assets (Mei, 2022).

SOEs and non-SOEs have both similarities and differences. In terms of financial disclosure, publicly traded SOEs and non-SOEs are subject to the same regulations. According to the requirements set by the China Securities Regulatory Commission (CSRC) and the stock exchanges, all listed companies must release audited financial statements every quarter.[9]

However, there are notable differences in terms of ownership structures that distinguish SOEs from non-SOEs. In the case of SOEs, the State-owned Assets Supervision and Administration Commission (SASAC) serves as the controlling shareholder, typically holding around 40% to 45% of outstanding shares, while private blockholders are relatively scarce in this context. In non-SOEs, the ownership structure differs significantly. Approximately 45% of blockholders in non-SOEs are comprised of other non-SOEs, indicating a significant presence of corporate entities as stakeholders. Additionally, individuals hold approximately 35% of the ownership in non-SOEs, reflecting the participation of individual investors. In contrast, only 15% of blockholders in non-SOEs represent SASAC or SOEs, underscoring the relatively smaller influence of state ownership in these entities.[10]

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[7] https://insight.factset.com/investing-in-chinese-state-owned-enterprises.
[8] https://www.weforum.org/agenda/2020/05/how-reform-has-made-chinas-state-owned-enterprises-stronger/.
[9] http://www.sasac.gov.cn/n2588035/n2588320/n2588335/c24789613/content.html (in Chinese).
http://www.sse.com.cn/lawandrules/regulations/csrcannoun/c/4225194.pdf (in Chinese).
[10] Based on top 10 shareholder data from the China Securities Market and Accounting Research (CSMAR) database.

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2.2. The 2009 pay regulation

On September 16, 2009, six administrative departments[11] 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 not available to the public, but the government posted the announcement of its issuance and a summary of the Guideline on its official website.[12] We obtain an excerpt of the Guideline (in Chinese) from PKULAW database[13] and provide the translated excerpt in the Internet Appendix.

According to the excerpt of the Guideline (hereafter, the Excerpt), executive compensation should consist of a basic salary, performance-based salary (cash bonuses), and equity-based compensation, but is mainly determined by basic salary and bonuses (Article 3). The Excerpt indicates that executive compensation package is designed to avoid excessive growth of the salary level of the executive and to narrow the pay disparity between executives and employees (Article 5).[14] Specifically, the basic annual salary of executives is no more than five times the average salary of the employees of CSOEs in the previous year (Article 4). The basic salary is then adjusted with a salary adjustment factor determined based on firm characteristics, which is capped at 1.5 (Article 5). Performance-based salary is capped at three times the

[11] The Ministry of Human Resources and Social Security, Ministry of Finance, State-Owned Assets Supervision and Administration Commission (SASAC), National Audit Office, Ministry of Supervision, and Organization Department of the Communist Party of China.

[12] http://www.gov.cn/jrzg/2009-09/16/content_1419270.htm (in Chinese).

[13] PKULAW is a law database developed by Peking University Law School.

[14] 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) in 2007, which was more than 40 times the average pay of workers in Chinese firms. Fourteen of the 20 executives were from two CSOEs, China Shenhua Energy and China Oilfield Services Limited. 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).

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basic salary (Article 6). The pay regulation as shown in the Excerpt indicates that executive compensation theoretically allowed is the maximum of 30 times the average employee salary.[15]

The pay ratio of 30 times appears too high to be binding given the relatively low level of executive compensation in CSOEs. However, we suspect that the pay regulation is more limiting than the maximum pay ratio theoretically allowed. First, the salary adjustment factor is to be strictly verified to avoid excessive growth of the salary level of the executive (Article 5), suggesting that the basic salary of executives is lower than the cap of 7.5 times the average employee salary in most cases. Second, few executives are likely compensated with bonuses three times the basic salary because the bonus must be reviewed by the Ministry of Human Resources and Social Security (Article 6). Consistent with our conjecture, the actual average pay ratio of CSOEs was reported to be much lower than the maximum ratio. According to an article published by SASAC, the average pay ratio of all CSOEs was 9.9 in 2002 and increased to 13.4 by 2010, after which it decreased to 12.0 by 2014 likely due to the pay regulation.[16]

Before the Guideline was issued, 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 issued by the SASAC on June 11, 2004. These regulations were considered ineffectively enforced, casting doubts on the effectiveness of the Guideline of 2009. However, there are several reasons to suspect that the Guideline has been effectively enforced. First, the Guideline was issued jointly by six administrative departments with the consent of the State Council, an unprecedented move indicating 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. Second, 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.

[15] Executive compensation can be the maximum of 30 times the average employee salary because the basic salary can be maximum of 7.5 times the average employee salary (five times with the adjustment factor of 1.5) and performance-based salary can be maximum of 22.5 times (three times the basic salary) the average employee salary.

[16] http://www.sasac.gov.cn/n2588025/n2588139/c2820992/content.html (in Chinese).

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We note that the Guideline does not impose a maximum dollar limit on executive compensation, but a limit based on the formula whose application is at the discretion of regulators. Whether the pay regulation has been effectively enforced is also debatable. Thus, it is difficult to evaluate ex ante how binding the pay regulation can be, and its effect on executive compensation is essentially an empirical question.

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.[17] To be included in the sample, a firm must satisfy the following criteria:

1. the ultimate controlling shareholder can be identified;
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

[17] 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).

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identified as a CSOE if its ultimate controlling shareholder is SASAC. SASAC publishes the 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 Payments for Expenses Related to Operating Activities" section of financial statement footnotes as in Gul, Cheng, and Leung (2011) and Xu, Li, Yuan, and Chan (2014).[18] Chinese accounting standards require companies to disclose total cash payments for expenses related to operating activities as a separate item in the statement of cash flows. The cash payments include penalty expenses, travel expenses, entertainment expenses, and insurance fees, etc. While the standard mandates the disclosure of total cash payments, it also requires that if each expense amount is material, it should be reported individually. However, since the definition of "material" is subjective, we consider the separate disclosure of perk-related expenses to be discretionary or voluntary. Empirically, our findings show that out of the 102 CSOEs examined, only 57 of them choose to disclose perk-related expenses separately, while all of them disclose the total cash payments for expenses related to operating activities. This observation aligns with our perspective on the matter.

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 Activities" 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 three non-CSOEs in the same industry that are closest in total

[18] 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. We find 870 observations with perk data in both sections, 689 of which are during 2010-2015 (i.e., only 181 observations during 2005-2009). The 870 overlapping observations account for 62% of all perk data (1,403 observations) we use in our regression analysis. The correlation between the total perk consumption (in logarithm) from the two sections for "overlapping" observations is 80%.

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assets.[19] We are able to find 283 matching non-CSOEs for the 102 CSOEs. For the matched sample of non-CSOEs, we download their financial statements and collect the perk information.

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 the 102 CSOEs and 169 of the 283 matched non-CSOEs.

We note that our perk data have sample selection bias because separate disclosure of perk-related expenses in the "Cash Payments for Expenses Related to Operating Activities" section is not mandatory. However, the bias is unlikely to drive our findings that perk consumption of CSOEs increased following the pay regulation. There is no reason to suspect that firms voluntarily disclosed more perk consumption following the 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-

[19] 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.

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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. China Securities Regulatory Commission (CSRC) requires that for each member of the board of directors, supervisory board, and each senior manager, listed companies disclose whether the individual is compensated, the amount of total cash compensation (including basic salary, bonus, allowance, provisions, various insurances, and any other compensation), and year-end stock holding. We use total cash compensation as our CEO compensation measure.

While stock ownership is an important instrument to align the long-term interests of executives with those of the owners, we exclude equity-based compensation for two reasons. First, stock grants are not widely adopted by Chinese firms. Stock options have only been allowed since 2007, and as approval from the 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, very few firms granted restricted stocks or options to their CEOs each year.[20] Second, we do not find significant CEO ownership changes for our sample firms, particularly so for CSOEs, during the sample period.[21] We find little changes in the proportion of CEOs with equity ownership, the average percentage of CEO stock ownership and the average market value of CEO stock holdings across our sample period. If anything, the magnitude of CEO

[20] We obtain CEO's equity-based compensation grants data from CSMAR database and find only 27 (381) option grants and 15 (271) restricted stock grants recorded for CSOEs (non-CSOEs) out of 993 (11,428) firm-year observations during our sample period, representing only 2.7% (3.3%) and 1.5% (2.4%) of all sample observations, respectively.

[21] Conyon and He (2011) show that CEO stock ownership is an important component of CEO compensation and incentives in China with the nominal value of stock ownership exceeding the value of cash compensation. They find that for their sample period of 2001–2005, 32% of the firms in their sample provide equity compensation to CEOs. We find that the proportion of firms with CEO stock ownership is in the range of 30% to 40% during the period of 2005–2012.

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stock ownership appears to decrease after the 2009 pay regulation, suggesting that CSOEs do not appear to increase equity compensation as a way to avoid the pay regulation.

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.[22] 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 inflation-adjusted to 2010 CNY and 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 3.42 million CNY (505,000 USD); this number is doubled in CSOEs and almost 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 consumption scaled by sales (assets) for CSOEs is 1.14% (0.77%), which is similar to the 1.31% (0.81%) for non-CSOEs. The scaled perk figures are comparable to those documented in Gul, Cheng, and

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

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Leung (2011) and Xu, Li, Yuan, and Chan (2014). We note that the mean (median) perk consumption per executive for CSOEs is about 10.8 (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 2.4% (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 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

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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 support the view that the Guideline is effective in restricting CEO compensation of 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.[23] For LSOEs, perk consumption slowly increased during the 2007–2013 period. It then sharply decreased in 2014 and 2015 likely due to the anti-corruption campaign. 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. Jiang, Lee, and Yue (2010) argue that after several heavy-handed moves by the State Council and CSRC targeting at both the listed companies and their colluding shareholders, most of the listed companies in China have resolved their net other receivables balance by the end of 2006. However, it is arguable whether intercorporate loans are no longer employed as a tunneling channel since 2006. For instance, several studies find net other receivables as a proxy for tunneling for the post-2006 period (e.g., Chen and Keefe 2020; Yang, Guariglia and Guo 2019; Firth, Lin, Wong and Zhao 2019). More importantly, CSOEs seem to have been unaffected by the State Council and CSRC's campaigns, as their net other receivables remain unchanged during 2005-2009. The sharp increase in net other receivables for

[23] 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.

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CSOEs after 2010 is not likely to be driven by normal business activities, and we interpret it as evidence of increasing tunneling activities in CSOEs.

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 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 and PPS 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.[24]

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

[24] We acknowledge that non-CSOEs does not serve as an ideal control group for the DiD tests as CSOEs are distinct from non-CSOEs in various aspects. To alleviate this comparability concern, we conduct two sets of robustness tests using LSOEs and size-industry-matched non-CSOEs as two alternative control groups and the results (presented in the Internet Appendix) remain similar. However, these two alternative control groups can only alleviate but not eliminate the comparability concern.

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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 the 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, pay-performance sensitivity, 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:

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

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The dependent variable is the logarithm of CEO cash compensation.[25] 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 levels.[26]

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 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.

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

[25] Ideally, one should use the CEO pay multiple, or pay ratio, as dependent variable because the pay restriction is based on the ratio of CEO pay to the average employee wage. We are not able to use the pay ratio as dependent variable because employee numbers disclosed by Chinese companies appears noisy, which makes average employee wage based on these numbers and the pay ratio unreliable. To check the reliability of statistics on the number of employees, we calculate yearly changes in total employee wage (*ΔTotal wages*) and the number of employees (*ΔNumber of employees*) and compute the correlation between the two variables. The correlation is only 0.4. We also find that there are many cases in which *ΔTotal wages* and *ΔNumber of employees* have opposite signs, suggesting that the average employee wage is likely highly volatile. To further validate our claim that the measurement error in pay ratio is likely high, we use the pay ratio as dependent variable and repeat the tests in Table 5. The results show no significant changes in the pay ratio of CSOE CEOs after the regulation. We also note that the coefficient estimates on control variables are generally insignificant and the adjusted R^2 with firm fixed effects is substantially lower than that in Table 5, which is likely due to the fact that the dependent variable based the number of employees is measured with much error.

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

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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. Exponentiating the DiD coefficient indicates a 12.4% ($e^{-0.132}$ - 1= - 12.4%) decrease in CEO pay, suggesting that CEO pay cut is both statistically and economically significant.

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 Chinese firms listed in Hong Kong may not reflect actual CEO compensation as 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.[27] Alternatively, the pay regulation could be more "more binding" for Chinese firms listed in Hong Kong because they have high pre-regulation executive compensation, and, therefore, drives our main results. It is therefore prudent to verify that the regulation is effective for the majority of firms not listed in Hong Kong by removing them from the sample. When we restrict the sample to companies listed on domestic stock exchanges only, we find the results still hold.

4.2.2. Pay regulation effect on pay-performance sensitivity

The decline in CEO compensation levels among CSOEs seems to be a consequence of implementing caps on executive pay, aiming to curb excessive compensation. Given this circumstance, it is reasonable to anticipate a decrease in the Pay-Performance Sensitivity (PPS) for CSOEs following the regulatory changes. In this subsection, we explore the impact of pay regulation on PPS in CSOEs using the following specification:

$$\begin{aligned} Log(CEO\ compensation) &= \beta_1 Performance + \beta_2 Performance \times After\ 2009 + \\ &\beta_3 Performance \times D_CSOE + \beta_4 D_CSOE \times After\ 2009 + \beta_5 Performance \times \\ &D_CSOE \times After\ 2009 + \beta_6 CEO\ age + \beta_7 Female\ CEO + \beta_8 CEO\ duality + \\ &\beta_9 Log(total\ assets) + \beta_{10} Market\ to\ book\ ratio + Firm\ FE + Year\ FE + \varepsilon. \end{aligned} \tag{2}$$

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

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The dependent variable is the logarithm of CEO compensation. We use ROS and ROA as measures of firm performance. While most previous studies of PPS in the U.S. use stock return performance, we do not use this measure for several reasons. First, there is evidence that stock prices in the Chinese stock markets are influenced largely 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).

The interpretation of the coefficients is as follows: β_1 measures PPS for non-CSOEs before regulation; β_2 is the difference in PPS before and after regulation for non-CSOEs; β_3 is the difference in PPS between CSOEs and non-CSOEs before regulation; β_4 is the DiD in CEO compensation between CSOEs and non-CSOEs before and after regulation; and β_5 is the DiD in PPS between CSOEs and non-CSOEs before and after regulation, which is the main coefficient of interest.[28]

Table 6 presents the results. We use ROS to measure firm performance in columns (1) and (3) and ROA in columns (2) and (4). In columns (3) and (4), the sample period is constrained to 2005–2012 to exclude the anti-corruption campaign effect. The coefficient estimates for performance measures are significantly positive in all specifications, suggesting a strong positive PPS for non-CSOEs before regulation. We find that the estimates for Performance×After2009 are statistically insignificant in all specifications, suggesting that the PPS for non-CSOEs remains unchanged after 2009. The significantly positive coefficient estimates for Performance×D_CSOE suggest that CSOEs have a higher PPS than non-CSOEs before regulation. Depending on the specification, the compensation of CEOs for CSOEs is 2 to 6 times as sensitive to performance as that for non-CSOEs before regulation. For instance, in column (3), the estimates of PPS before regulation for non-CSOEs and CSOEs are 0.283 and 1.749 (0.283+1.466),

[28] We acknowledge that our approach to measure PPS is suboptimal. Ideally, one can examine the detailed components of CEO compensation (e.g., base salary, performance-based cash bonus, etc.) and study how the pay regulation changes the composition of the CEO compensation contract. However, CSRC requires listed companies to disclose total pay only, but not the details of total pay, forcing us to rely on total pay in measuring PPS.

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respectively, indicating that the PPS of CSOEs is 6.2 times that of non-CSOEs. This finding is consistent with Firth, Fung, and Rui (2006) who find that CEO pay is positively related to ROS for CSOEs.

Our main variable of interest, Performance×D_CSOE×After2009, captures the DiD in PPS between CSOEs and non-CSOEs before and after regulation. The coefficient estimates are significantly negative in all specifications, suggesting that the PPS of CSOEs relative to non-CSOEs decreases significantly after regulation. Interestingly, the magnitude of the estimates is close to that of the coefficient estimates for Performance×D_CSOE in absolute value. This result suggests that after regulation, the PPS of CSOEs decreases to the level of non-CSOEs. Unlike the results in Table 5, the coefficient estimates for D_CSOE×After2009 are not significant. This is because in Table 6 we allow the slope of compensation with respect to performance to vary between CSOEs and non-CSOEs and across time.

The results in Table 6 are consistent with the view that the compensation of well-performing CEOs is capped to curb their high compensation, which in turn hurts their incentive to perform.

4.2.3. Pay regulation effect on perk consumption

In Table 7 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

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in addition to the control variables. The coefficient estimate for D_CSOE×After2009 is 0.231 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 0.246 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 (+0.246) 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.[29] Thus, the increase in perk consumption appears substantially larger than the decrease in CEO pay. This finding is expected: Theoretically, the two numbers need not offset each other unless one assumes that CEO pay and perk consumption contribute equal amounts of utility to CEOs. Empirically, it is important to note that measuring perk consumption can be subject to noise or measurement error. Additionally, the sample used in Table 7 is only a subset of the larger sample used in Table 5. Consequently, due to differences in sample size and potential measurement discrepancies, it is not appropriate to directly compare the coefficient estimates presented in Table 5 and Table 7.

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 (Pay_Cut_Large), and another that takes the value of one if the change is higher than the median

[29] Exponentiating the DiD coefficient estimate of -0.132 in column (3) of Table 5 indicates a 12% ($e^{-0.132}$ - 1= - 12.4%) decrease in CEO pay while exponentiating the DiD coefficient estimate of 0.246 in column (3) of Table 7 indicates a 28% ($e^{0.246}$ - 1= 27.8%) increase in perk consumption.

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(Pay_Cut_Small). 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. After exponentiating the coefficient estimates for the interaction terms, the results show a statistically significant 36% increase in perk consumption for CSOEs that experienced below-median CEO compensation change, but only an 18% 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 7 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.

4.2.4. Pay regulation effect on tunneling

In Table 8, 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. Consistent with Jiang, Lee, and Yue (2010) and Liu and Tian (2012), we find that ROA, tangibility, block ownership and tax rate are negatively associated with net other receivables, and the coefficient on sales growth is insignificant. However, Liu and Tian (2012) find a

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positive association between control-ownership wedge and other receivables, whereas we find the coefficient estimate insignificant.[30]

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 effect. 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 (Pay_Cut_Large) and another that takes the value of one if the change is higher than the median (Pay_Cut_Small). Then we interact these variables with the After2009 dummy. After exponentiating the coefficient estimates for the interaction terms, the results suggest that tunneling increased by 36.9% for CSOEs whose CEOs experienced a bigger pay cut. This increase in tunneling is statistically significant. In sharp contrast, tunneling increased insignificantly by only 15.1% 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 8 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.

4.2.5. Pay regulation effect on firm performance

[30] We suspect that the different findings are caused by the difference in samples used: Liu and Tian (2012) focus on non-SOEs, which have larger control-ownership wedges, whereas local and central SOEs make up about half of our sample.

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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 the reasons discussed in section 4.2.2. Table 9 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 for Chinese firms. 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 8, 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 2.5 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.

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Although we argue that the poor performance of CSOEs whose CEOs experienced a bigger pay cut is due to CEOs' increased incentive to consume 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 the 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 financial 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 LSOEs and size-industry-matched non-CSOEs as two alternative control samples for CSOEs. 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 the 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

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that the pay regulation effect, rather than the crisis effect, is more likely to be the cause of our findings. Furthermore, we note that the PPS in CSOEs dropped significantly following the pay regulation, as evidenced in Table 6. If the pay cut was driven by the deterioration in performance following the crisis, we should not observe the drop in PPS in CSOEs.

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 10 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 the 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. While the coefficient estimate for Performance_High×After2008 is statistically insignificant, whereas that for Performance_Low×After2008 is significant at the 10% level, the estimates for the two groups are not statistically different, suggesting 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., a 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

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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:

$$Outcome\ variable = \beta_1 D_CSOE \times Year + \beta_2 Year + \beta_k Control\ variables + Firm\ FE + \varepsilon. \quad (3)$$

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 11 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 11 suggest that the parallel trend assumption is generally satisfied in our sample.

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5.3. Alternative control samples

Although our research design 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-SOEs.[31] We repeat the tests in Tables 5, 7, 8, and 9 and find that the results remain unchanged. The results are available in the Internet Appendix (Table IA2).

We also repeat the tests in Tables 5, 8, and 9 using the size-industry-matched non-CSOEs for which we collect the perk consumption data as another alternative control sample. We find that the results remain unchanged. The results are available in the Internet Appendix (Table IA3).

5.4. Controlling for additional fixed effects

We also repeat the tests in Tables 5, 7, 8, and 9 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. 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 (Tables IA4 and IA5).

5.5. Top three executive compensation as a measure of compensation

[31] It is possible that the CEO compensation in LSOEs is also affected by the Guideline due to "spillover" effect (i.e. local governments restrict executive compensation for LSOEs to cater the central government). The effect would bias against finding significant results in the robustness test. The empirical results provide no evidence of such effect.

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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, 8, and 9 using the compensation of the top three executives and find consistent results. The results are available in the Internet Appendix (Table IA6).

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 the 2012 anti-corruption campaign 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 7 using ETC as the proxy for perk consumption, we obtain practically the same results. We report the results in the Internet Appendix (Table IA7).

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

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for some firms. Nevertheless, when we repeat the tests in Table 8, we find similar results. We report the results in the Internet Appendix (Table IA8).

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. In Section 5.4 we additionally control for industry-year fixed effects and find the results remain unchanged. In this section, we exclude financial firms from the sample and repeat the tests in Tables 5, 7, 8, and 9. Financial firms comprise 1.37% of non-CSOEs and 4.63% of CSOEs. We find that the results remain similar after excluding financial firms. The results are available in the Internet Appendix (Table IA9).

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 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

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Appendix (Table IA10). In unreported tests, we repeat the tests in Tables 5, 7, 8 and 9 with CEO turnover dummy as an additional control, and the results remain the same.

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 centrally administered state-owned enterprises in 2009, we find that limiting CEO pay distorts CEO incentives and backfires, leading to a significant decrease in CEO pay-for-performance sensitivity, which in turn destroys firm performance. CEOs subject to the pay restriction also increase rent-seeking behavior by consuming more perks and tunneling more firm resources. 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 Payments for Expenses Related to Operating Activities" section of financial statement footnotes, adjusted to 2010 CNY.
Number of paid executives	Number of executives with nonzero cash compensation.
Net other receivables	Balance of 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.

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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_Large	Dummy variable equal to one for CSOEs whose abnormal pay change is below the median of CSOE abnormal pay changes after the regulation and zero otherwise.
Pay_Cut_Small	Dummy variable equal to one for CSOEs whose abnormal pay change is above the median of CSOE abnormal 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.

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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.

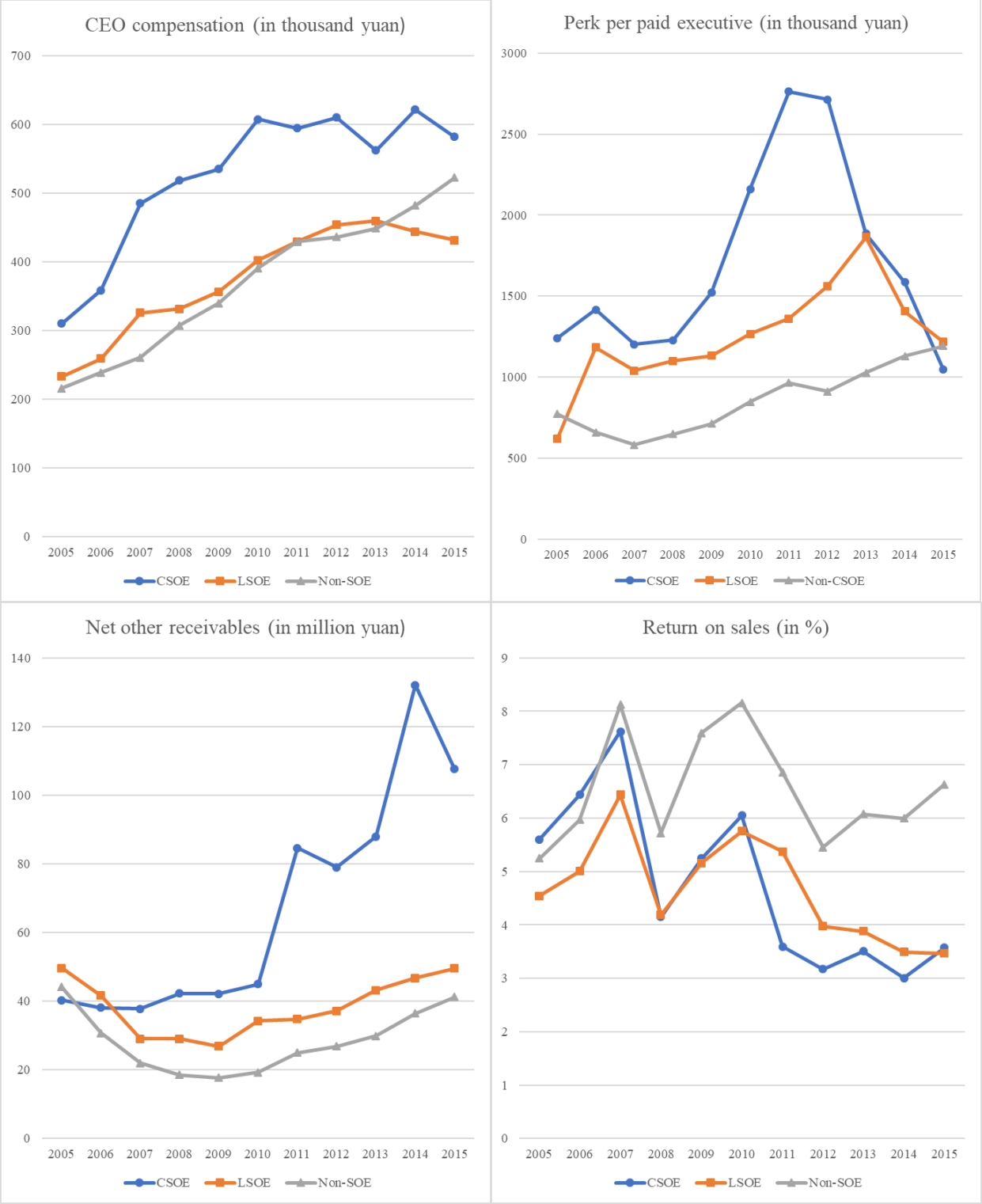

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Table 1. Sample composition

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	29	68
2006	80	872	38	85
2007	94	1,024	42	105
2008	99	1,144	42	127
2009	95	1,119	35	116
2010	95	1,122	30	104
2011	94	1,116	31	96
2012	95	1,103	33	92
2013	93	1,096	26	93
2014	92	1,076	26	85
2015	89	1,044	21	79
Number of observations	993	11,428	353	1,050
Number of unique firms	102	1,212	57	169

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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)	12,421	25,160	2,764	993	155,824	6,320	11,428	13,806	2,641
Total sales (in millions)	12,421	6,575	1,579	993	23,938	4,185	11,428	5,067	1,474
Market capitalization (in millions)	12,421	9,658	3,777	993	30,463	6,954	11,428	7,850	3,617
Market to book ratio	12,421	3.831	2.728	993	3.214	2.410	11,428	3.885	2.757
Total wages (in millions)	12,421	442	123	993	1,766	369	11,428	327	113
Block ownership (%)	11,935	37.417	35.860	937	47.288	48.820	10,998	36.576	34.540
Control-ownership wedge (%)	11,914	6.190	0.000	936	4.771	0.000	10,978	6.311	0.411
Tangibility	12,421	0.261	0.231	993	0.259	0.200	11,428	0.261	0.232
Sales growth	12,219	0.199	0.108	985	0.207	0.140	11,234	0.199	0.106
Leverage	12,421	0.502	0.510	993	0.553	0.579	11,428	0.498	0.505
Tax rate	12,336	0.010	0.007	990	0.009	0.006	11,346	0.010	0.007
Panel B: CEO compensation and characteristics									
CEO compensation	12,421	542,479	378,338	993	642,538	531,293	11,428	533,785	365,630
CEO age	12,421	48	47	993	49	49	11,428	48	47
Female CEO	12,421	0.058	0	993	0.010	0	11,428	0.062	0
CEO duality	12,421	0.165	0	993	0.056	0	11,428	0.174	0
Panel C: Perk consumption									
Perks (in thousands) [A]	1,403	52,688	15,665	353	114,070	24,237	1,050	32,052	14,083
Number of paid executives [B]	1,403	15	14	353	15	14	1,050	15	14
A / B	1,403	3,424	1,081	353	6,947	1,685	1,050	2,239	990
Perks / sales (%)	1,403	1.266	0.792	353	1.140	0.676	1,050	1.308	0.827
Perks / assets (%)	1,403	0.795	0.498	353	0.767	0.453	1,050	0.805	0.513
Panel D: Proxy variable for tunneling									

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Net other receivables (in thousands)	12,301	161,564	32,426	967	637,311	64,853	11,334	120,974	30,843
Net other receivables / assets (%)	12,301	2.435	1.069	967	1.792	0.947	11,334	2.490	1.085
Panel E: Firm performance									
Return on sales (%)	12,421	6.802	5.627	993	6.394	4.513	11,428	6.837	5.768
Return on assets (%)	12,421	3.789	3.333	993	3.623	3.072	11,428	3.804	3.350

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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 (CSOE, LSOE, and non-SOE). 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	1,241.0	620.5	771.5	40.28	49.68	44.09	5.60	4.54	5.24
2006	358.4	259.4	238.9	1,417.1	1,182.1	659.7	38.15	41.59	30.70	6.44	5.00	5.97
2007	484.9	325.8	260.9	1,202.9	1,039.9	582.4	37.76	29.00	21.92	7.62	6.43	8.12
2008	518.6	331.4	307.8	1,227.5	1,100.5	648.7	42.24	29.09	18.52	4.15	4.19	5.72
2009	535.2	356.4	340.1	1,522.0	1,131.9	711.7	42.15	26.89	17.74	5.25	5.16	7.60
2010	607.6	402.2	391.0	2,161.0	1,267.6	847.2	44.96	34.20	19.22	6.05	5.76	8.16
2011	594.2	429.5	429.4	2,762.3	1,361.0	964.9	84.67	34.79	24.95	3.59	5.38	6.86
2012	609.9	453.9	436.0	2,712.7	1,561.9	911.5	78.96	37.16	26.84	3.17	3.98	5.45
2013	562.1	459.4	448.7	1,886.3	1,864.4	1,027.8	87.93	43.17	29.88	3.50	3.88	6.08
2014	621.7	443.9	482.0	1,586.1	1,406.1	1,130.1	132.11	46.70	36.43	3.01	3.50	5.99
2015	582.0	431.4	522.3	1,046.0	1,218.2	1,190.6	107.60	49.58	41.23	3.58	3.46	6.63

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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	14.219	15.001	0.578***
	Non-CSOE	13.716	13.961	0.237***
	Difference	-0.503***	-1.039***	0.342***
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	-0.061	0.098	0.201**
	Non-CSOE	0.029	-0.071	-0.118*
	Difference	0.089*	-0.169***	0.318**
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**

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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 *t*-statistics are reported in parentheses. ***, **, 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	12,421	12,421	12,421	12,058
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

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Table 6. Effect of pay regulation on pay-performance sensitivity

This table presents the regression results for pay-performance sensitivity. The dependent variable is the logarithm of CEO compensation. The sample period is 2005–2015 in columns (1) and (2) and 2005–2012 in columns (3) and (4). Columns (1) and (3) use return on sales (ROS) as the performance measure, and columns (2) and (4) use return on assets (ROA). All regressions include firm and year fixed effects. Standard errors are adjusted for clustering at both firm and year levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively. All variables are defined in Appendix 1.

Variables	Sample period: 2005–2015		Sample period: 2005–2012	
	ROS	ROA	ROS	ROA
	(1)	(2)	(3)	(4)
Performance	0.383***	1.783***	0.283***	1.595***
	(4.617)	(7.872)	(3.622)	(6.668)
Performance×After2009	-0.012	0.226	0.059	0.260
	(-0.136)	(0.754)	(0.575)	(0.914)
Performance×D_CSOE	1.446***	1.893**	1.466***	1.989**
	(3.871)	(3.079)	(3.715)	(3.088)
D_CSOE×After2009	-0.070	-0.083	-0.046	-0.038
	(-1.323)	(-1.451)	(-0.953)	(-0.683)
Performance×D_CSOE×After2009	-1.181**	-1.921***	-0.882*	-2.047*
	(-2.953)	(-3.294)	(-1.946)	(-2.283)
CEO age	0.011***	0.011***	0.011***	0.011***
	(4.546)	(4.525)	(4.445)	(4.327)
Female CEO	-0.014	-0.024	-0.088	-0.103
	(-0.224)	(-0.379)	(-1.429)	(-1.692)
CEO duality	0.068	0.072	0.143***	0.152***
	(1.709)	(1.717)	(3.871)	(4.241)
Log(total assets)	0.212***	0.209***	0.218***	0.219***
	(8.996)	(8.850)	(7.483)	(7.870)
Market to book ratio	0.006*	0.005	0.007*	0.006
	(1.856)	(1.447)	(1.910)	(1.712)
Number of observations	12,421	12,421	8,927	8,927
Adjusted R^2	0.672	0.677	0.700	0.705
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

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Table 7. 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 *t*-statistics are reported in parentheses. ***, **, 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		0.231**	0.246***		
		(3.028)	(3.971)		
D_CSOE×After2012			-0.037		
			(-0.378)		
Pay_Cut_Large×After2009				0.309***	0.334***
				(3.311)	(3.700)
Pay_Cut_Small×After2009				0.168	0.212**
				(1.777)	(2.635)
Log(total assets)	0.337***	0.322***	0.322***	0.323***	0.213**
	(3.645)	(3.404)	(3.404)	(3.411)	(2.930)
Log(total wages)	0.476***	0.484***	0.483***	0.485***	0.386***
	(5.312)	(5.543)	(5.542)	(5.565)	(5.417)
Number of observations	1,381	1,381	1,381	1,381	1,045
Adjusted R^2	0.884	0.885	0.885	0.885	0.902
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes

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Table 8. 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 *t*-statistics are reported in parentheses. ***, **, 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_Large×After2009				0.314**	0.333**
				(2.753)	(2.693)
Pay_Cut_Small×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	11,541	11,541	11,541	11,541	8,177
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

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Table 9. 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 return on sales in columns (1) to (3) and return on assets in columns (4) to (6). All regressions include firm and year fixed effects. Standard errors are clustered at the firm and year levels, and *t*-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variables	Return on sales (%)			Return on assets (%)		
	(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_Large×After2009			-5.388**			-2.192**
			(-3.069)			(-2.713)
Pay_Cut_Small×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	12,421	12,421	12,421	12,421	12,421	12,421
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

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Table 10. 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 *t*-statistics are reported in parentheses. ***, **, 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		-0.047		0.093	
	(-0.308)		(-0.759)		(1.629)	
D_CSOE×After2009	-0.168***		0.266***		0.162**	
	(-4.282)		(4.035)		(2.580)	
Performance_High×After2008		-0.044		0.118		0.252**
		(-0.585)		(1.005)		(2.327)
Performance_Low×After2008		-0.260**		0.202*		0.210
		(-3.060)		(2.151)		(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***	0.323***	0.326***	0.943***	0.943***
	(8.928)	(8.884)	(3.405)	(3.488)	(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)			0.484***	0.482***		
			(5.531)	(5.519)		
Block ownership					-0.003	-0.003
					(-1.677)	(-1.667)

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Control-ownership wedge					-0.003	-0.003
					(-0.554)	(-0.554)
Tangibility					-0.882***	-0.878***
					(-4.473)	(-4.420)
Sales growth					-0.013	-0.014
					(-0.560)	(-0.580)
Leverage					0.706***	0.709***
					(5.154)	(5.167)
Tax rate					-5.534**	-5.534**
					(-2.276)	(-2.262)
Number of observations	12,421	12,421	1,381	1,381	11,541	11,541
Adjusted R^2	0.670	0.670	0.885	0.885	0.756	0.756
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

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Table 11. Tests of the parallel trend assumption

This table presents the regression results for the tests 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 return on sales 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 *t*-statistics are reported in parentheses. ***, **, 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) Return on sales (%)
Panel A. Sample period: 2005-2009				
D_CSOE×Year	-0.004 (-0.165)	0.038 (1.316)	0.048 (1.365)	-1.622** (-4.554)
Year	0.086*** (7.315)	0.004 (0.165)	-0.217*** (-14.077)	-0.733 (-1.046)
Panel B. Sample period: 2007-2009				
D_CSOE×Year	-0.041 (-1.057)	-0.026 (-0.540)	0.027 (0.570)	-1.207 (-1.884)
Year	0.062** (5.937)	0.016 (0.592)	-0.160** (-6.089)	-2.427 (-2.664)
Control variables	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes

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Restricting CEO Pay Backfires: Evidence from China

Internet Appendix

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Summary

The Internet Appendix presents the translated excerpt of the Guideline to Further Regulate Executive Compensation in Central State-Owned Enterprises (IA1) and reports additional results from the robustness tests in Section 5 (Tables IA2 to IA10). Table IA2 reports the results using LSOEs as the control sample (Section 5.3). Table IA3 reports the results using size-industry-matched non-CSOEs as the control sample (Section 5.3). Table IA4 reports the results controlling for industry-year fixed effects (Section 5.4). Table IA5 reports the results controlling for size-year fixed effects (Section 5.4). Table IA6 reports the results using top three executive compensation as a measure of compensation (Section 5.5). Table IA7 presents the results using entertainment and travel costs as a proxy for perk consumption (Section 5.6). Table IA8 uses related-party transactions as a measure of tunneling (Section 5.7). Table IA9 reports the results after excluding financial firms from the sample (Section 5.8). Table IA10 reports the results for CEO turnover (Section 5.9).

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IA1. A translated excerpt from the Guideline

This appendix is a translated excerpt from the Guideline to Further Regulate Executive Compensation in Central State-Owned Enterprises. The original version of the excerpt (in Chinese) was obtained from the PKULAW database. The Guideline includes 23 items, but items (2), (7), (15), (16), (17), (20), and (22) were not included in the original excerpt.

The Guideline to Further Regulate Executive Compensation in Central State-Owned Enterprises (excerpt)

(September 10th 2009 Ministry of Human Resources and Social Security [2009] File no. 105)

I. Scope and basic principles of the regulation of executive compensation in central state-owned enterprises

1. Scope of application

In this guideline, a central state-owned enterprise refers to an enterprise that is solely owned or controlled by the state, for which the State Council executes the investors' rights on behalf of the state (hereinafter referred to as the enterprise). The principal executives of the enterprises referred to in this guideline include the chairman, the secretary of the party committee, the general manager, the chairman of the supervisory board, and other responsible persons (hereinafter referred to as the executive). The compensation of executives hired through open recruitment overseas shall be determined through negotiation and reported to the compensation review department.

II. Determination of the proper compensation level and structure

3. Executive compensation consists of a basic annual salary, performance-based salary, and medium- and long-term incentive compensation, but is mainly determined by the basic annual salary and performance-based salary.

4. The basic annual salary is the basic annual income of the executive. It is mainly based on the complexity of the business operation and the responsibility and risk assumed by the executive. The basic annual salary should be no more than five times the average salary of the employees of the enterprise in the previous year. The salary is then adjusted with an adjustment coefficient. In principle, the basic annual salary is estimated once a year. If the enterprise has had no real economic growth in the previous year, the basic annual salary shall not be increased.

5. The salary adjustment coefficient is determined by considering the enterprise and industry characteristics such as the total assets, net assets, main business income, total profit, number of employees, product market competition, and risk and cost control. The salary adjustment coefficient should be strictly verified. The ratio of the basic annual salary of the executive to the wages of the employees should be properly determined to avoid excessive growth of the salary level of the executive. The state imposes a cap on the salary adjustment coefficient, and the tentative maximum is 1.5.

6. The performance-based salary is the income associated with the executive's operating performance. Based on the results of the annual assessment, the performance-based salary will be determined up to a maximum of three times the basic annual salary.

Any adjustment in the ratio of performance-based salary to basic annual salary must be reviewed and determined by both the compensation review department and the Ministry of Human Resources and Social Security. The adjustment must keep the compensation level within the range suggested by the regulations. If the average salary of employees does not increase, the performance-based salary of the executive shall not increase either.

8. Qualified enterprises can prudently explore medium- and long-term incentive compensation. Executives of listed companies that meet the requirements of the China Securities Regulatory Commission and relevant authorities and have sound internal control mechanisms may carry out trial implementations of equity incentive plans. Those that do not meet the conditions for implementing the equity incentive plan may explore other types of incentive plans with the approval of the compensation review department.

III. Standardization of compensation payment

9. The basic annual salary will be paid monthly. Payment of the performance-based salary will follow the principle of "payment after assessment." Based on the results of the annual operational performance assessment, the enterprise will prepare provisions and pay the executives in instalments. The fractions of current and future payments will be determined by the compensation review department.

10. Deferred payment of the performance-based salary will be linked to the operating performance assessment of the executives during their tenure. In the case of qualifying performance, the deferred payments will be made in full. In the case of unsatisfactory performance or major mistakes during tenure causing substantial cost to the enterprise, part or all of the deferred payments will be deducted depending on the responsibility of the executive.

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11. After executives have been transferred from their enterprise due to a job change, their salary records[1] shall be transferred within one month, or within the time frame specified by the party organization. Except for any performance-based salary that has been deferred or accrued before departure, executives cannot receive further compensation from the enterprise. If executives leave their original position due to a job change but their salary records need to be retained in the enterprise, the executives cannot continue to receive a performance-based salary except what was deferred or accrued before their departure.
12. If executives retire at the statutory retirement age, they shall receive a pension in accordance with the corresponding regulations. Except for any performance-based salary that was deferred or accrued before their departure, executives cannot receive a salary from the enterprise after retirement.

IV. Standardization of supplementary insurance and on-duty consumption
13. Enterprises that provide pensions and supplementary medical insurance for executives on top of the basic social insurance required by law must strictly follow the corresponding regulations set by the state to determine the treatment standards and costs incurred.
14. The on-duty consumption costs of executives need to be strictly regulated. Executives must follow the on-duty compensation regulations strictly. Payment or reimbursement of personal expenses as on-duty compensation is strictly prohibited.

VI. Strengthened monitoring of compensation for CSOE executives
18. The annual compensation plans of executives must be reviewed by or filed with the compensation review department and approved based on the related regulations and proper procedures.
19. All legal monetary income of executives should be included in the compensation system for overall management. Executives must not obtain monetary income from the enterprise other than legally regulated compensation. Executives who also hold positions in the enterprise's subsidiaries and investees cannot receive additional compensation.
21. The enterprise must follow the regulations for disclosing the compensation plan, compensation level, supplementary insurance, on-duty consumption, etc., and accept oversight from employees. Publicly listed companies should timeously disclose information on executive compensation following the "Administrative Measures on Information Disclosure by Listed Companies."
23. The Ministry of Human Resources and Social Security will work together with the Ministry of Finance, State-Owned Assets Supervision and Administration Commission, National Audit Office, Ministry of Supervision, and Organization Department of the Communist Party to monitor the process and results of the implementation of the compensation regulations. Disciplinary sanctions and fines will be imposed on those who violate the regulation, and illegal income will be retracted.

[1] "Salary record" refers to a file containing the employment and salary information (both current and historical) of an employee of a government or state-owned entity. The transfer of a "salary record" between government or state-owned entities normally indicates the transfer of an employment contract.

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Table IA2. Results using LSOEs as the control sample

This table presents the regression results using LSOEs as the control sample for CSOEs. 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 return on sales in columns (9)-(11). All regressions include firm and year fixed effects. Standard errors are clustered at the firm and year levels, and *t*-statistics are reported in parentheses. ***, **, 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)			Return on sales (%)		
D_CSOE×After2009	-0.118**	-0.096*	0.252**	0.234***		0.191*	0.174		-2.757*	-3.403**	
	(-2.285)	(-2.105)	(3.015)	(3.314)		(2.024)	(1.741)		(-2.036)	(-2.386)	
D_CSOE×After2012		-0.046		0.045			0.035			1.330	
		(-0.956)		(0.389)			(0.497)			(1.026)	
Pay_Cut_Large×After2009					0.319**			0.273**			-4.217**
					(3.164)			(2.293)			(-2.876)
Pay_Cut_Small×After2009					0.198*			0.098			-1.285
					(1.984)			(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**	0.220**	0.220**	0.222**	0.952***	0.952***	0.951***	1.313	1.305	1.343
	(2.860)	(2.873)	(2.794)	(2.768)	(2.820)	(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)			0.401***	0.401***	0.404***						
			(3.877)	(3.874)	(3.894)						
Block ownership						-0.001	-0.001	-0.001			
						(-0.267)	(-0.263)	(-0.273)			

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Control-ownership wedge						0.001	0.001	0.001			
						(0.261)	(0.258)	(0.278)			
Tangibility						-0.941**	-0.942**	-0.936**			
						(-3.084)	(-3.090)	(-3.067)			
Sales growth						0.017	0.017	0.017			
						(0.489)	(0.493)	(0.497)			
Leverage						0.791**	0.789**	0.793**			
						(2.857)	(2.857)	(2.861)			
Tax rate						-5.551	-5.555	-5.384			
						(-1.681)	(-1.683)	(-1.638)			
Observations	5,063	5,063	835	835	835	4,688	4,688	4,688	5,063	5,063	5,063
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

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Table IA3. Results using size-industry-matched non-CSOEs as the control sample

This table presents the regression results using size-industry-matched non-CSOEs as the control sample for CSOEs. Each CSOE is matched with up to three non-CSOEs in the same industry with the closest total assets. The dependent variable is the logarithm of CEO compensation in columns (1) and (2), the logarithm of net other receivables in columns (3)-(5), and return on sales in columns (6)-(8). All regressions include firm and year fixed effects. Standard errors are clustered at the firm and year levels, and *t*-statistics are reported in parentheses. ***, **, 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)
	Log(CEO compensation)		Log(net other receivables)			Return on sales (%)		
D_CSOE×After2009	-0.134**	-0.093*	0.181*	0.148		-2.139	-2.693*	
	(-2.365)	(-1.852)	(1.875)	(1.377)		(-1.642)	(-2.190)	
D_CSOE×After2012		-0.083		0.069			1.130	
		(-1.629)		(0.868)			(0.942)	
Pay_Cut_Large×After2009					0.279**			-3.177*
					(2.333)			(-2.170)
Pay_Cut_Small×After2009					0.074			-1.083
					(0.649)			(-0.631)
CEO age	0.011***	0.011***						
	(3.414)	(3.384)						
Female CEO	0.000	0.005						
	(0.001)	(0.057)						
CEO duality	0.039	0.038						
	(0.760)	(0.738)						
Log(total assets)	0.179***	0.178***	0.927***	0.927***	0.926***	0.903	0.909	0.921
	(4.684)	(4.688)	(13.739)	(13.733)	(13.753)	(1.009)	(1.018)	(1.030)
Return on sales	0.739***	0.742***	-1.206***	-1.210***	-1.205***			
	(5.518)	(5.562)	(-4.676)	(-4.684)	(-4.692)			
Market to book ratio	0.010	0.009						
	(1.544)	(1.502)						
Block ownership			-0.001	-0.001	-0.001			
			(-0.336)	(-0.339)	(-0.350)			
Control-ownership wedge			-0.010*	-0.010*	-0.010*			
			(-1.840)	(-1.840)	(-1.834)			
Tangibility			-1.293***	-1.297***	-1.286***			
			(-3.429)	(-3.439)	(-3.413)			
Sales growth			0.035	0.036	0.035			
			(0.667)	(0.684)	(0.663)			
Leverage			0.468	0.466	0.476			
			(1.645)	(1.638)	(1.674)			
Tax rate			1.328	1.360	1.600			
			(0.313)	(0.320)	(0.382)			
Observations	3,833	3,833	3,591	3,591	3,591	3,833	3,833	3,833
Adjusted R^2	0.653	0.653	0.802	0.802	0.802	0.574	0.574	0.574
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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Table IA4. 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 return on sales in columns (9)-(11). All regressions include firm fixed effects. Standard errors are clustered at the firm and year levels, and *t*-statistics are reported in parentheses. ***, **, 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)			Return on sales (%)		
D_CSOE×After2009	-0.160**	-0.115**	0.247***	0.250***		0.220**	0.202*		-3.727**	-3.880**	
	(-3.008)	(-2.553)	(3.373)	(4.051)		(2.496)	(1.971)		(-2.510)	(-2.404)	
D_CSOE×After2012		-0.092*		-0.005			0.037			0.314	
		(-1.933)		(-0.055)			(0.480)			(0.245)	
Pay_Cut_Large×After2009					0.324***			0.304**			-5.403**
					(3.514)			(2.642)			(-3.110)
Pay_Cut_Small×After2009					0.186*			0.126			-2.056
					(2.022)			(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***	0.261***	0.261***	0.262***	0.943***	0.943***	0.942***	2.717***	2.718***	2.725***
	(8.990)	(9.038)	(3.626)	(3.608)	(3.643)	(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)			0.439***	0.439***	0.440***						
			(5.565)	(5.561)	(5.607)						
Block ownership						-0.003	-0.003	-0.003			
						(-1.476)	(-1.476)	(-1.485)			

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Control-ownership wedge						-0.003	-0.003	-0.003			
						(-0.623)	(-0.624)	(-0.617)			
Tangibility						-0.907***	-0.907***	-0.904***			
						(-4.511)	(-4.519)	(-4.498)			
Sales growth						-0.016	-0.016	-0.016			
						(-0.640)	(-0.636)	(-0.633)			
Leverage						0.727***	0.726***	0.727***			
						(5.279)	(5.283)	(5.275)			
Tax rate						-5.460**	-5.459**	-5.394**			
						(-2.285)	(-2.284)	(-2.268)			
Observations	12,421	12,421	1,375	1,375	1,375	11,541	11,541	11,541	12,421	12,421	12,421
Adjusted R^2	0.672	0.672	0.887	0.887	0.887	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

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Table IA5. 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, 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 return on sales in columns (9)-(11). All regressions include firm fixed effects. Standard errors are clustered at the firm and year levels, and *t*-statistics are reported in parentheses. ***, **, 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)			Return on sales (%)		
D_CSOE×After2009	-0.150**	-0.114**	0.204**	0.223***		0.190**	0.162		-2.527	-3.033*	
	(-2.877)	(-2.496)	(2.686)	(3.450)		(2.313)	(1.708)		(-1.609)	(-1.847)	
D_CSOE×After2012		-0.075		-0.044			0.060			1.036	
		(-1.570)		(-0.447)			(0.767)			(0.841)	
Pay_Cut_Large×After2009					0.271**			0.255**			-3.716*
					(3.068)			(2.379)			(-2.139)
Pay_Cut_Small×After2009					0.152			0.119			-1.349
					(1.646)			(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***	0.475***	0.475***	0.473***	1.044***	1.045***	1.044***	2.801**	2.810**	2.816**
	(7.876)	(7.924)	(3.435)	(3.433)	(3.425)	(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)			0.485***	0.485***	0.487***						
			(5.946)	(5.939)	(5.985)						
Block ownership						-0.003	-0.003	-0.003			
						(-1.692)	(-1.690)	(-1.697)			

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Control-ownership wedge						-0.004	-0.004	-0.004			
						(-0.959)	(-0.961)	(-0.953)			
Tangibility						-0.882***	-0.883***	-0.880***			
						(-4.550)	(-4.556)	(-4.541)			
Sales growth						-0.008	-0.008	-0.008			
						(-0.349)	(-0.347)	(-0.348)			
Leverage						0.693***	0.692***	0.693***			
						(5.038)	(5.037)	(5.039)			
Tax rate						-5.481**	-5.485**	-5.433**			
						(-2.356)	(-2.360)	(-2.341)			
Observations	12,421	12,421	1,381	1,381	1,381	11,541	11,541	11,541	12,421	12,421	12,421
Adjusted R^2	0.671	0.671	0.886	0.886	0.886	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

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Table IA6. 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 columns (1) and (2), the logarithm of perks scaled by the number of paid executives in column (3), the logarithm of net other receivables in column (4), and return on sales in column (5). All regressions include firm and year fixed effects. Standard errors are clustered at the firm and year levels, and t-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variables	Log(top three compensation)		Log(perks / number of paid executives)	Log(net other receivables)	Return on sales (%)
	(1)	(2)	(3)	(4)	(5)
D_CSOE×After2009	-0.115**	-0.078			
	(-2.656)	(-1.756)			
D_CSOE×After2012	-0.064*				
	(-2.038)				
Return on sales×D_CSOE		0.949***			
		(4.495)			
Return on sales×D_CSOE×After2009		-0.750**			
		(-2.401)			
Pay_Cut_Large×After2009			0.335***	0.359**	-5.672**
			(3.558)	(3.152)	(-3.029)
Pay_Cut_Small×After2009			0.131	0.091	-2.006
			(1.214)	(0.782)	(-1.031)
Log(total assets)	0.249***	0.252***	0.321***	0.942***	3.008***
	(13.612)	(13.779)	(3.394)	(15.696)	(3.972)
Return on sales	0.319***	0.331***		-0.580***	
	(6.671)	(4.962)		(-3.416)	
Return on sales×After2009		-0.062			
		(-0.899)			
Market to book ratio	0.007**	0.007**			
	(2.258)	(2.786)			
Log(total wages)			0.487***		
			(5.563)		
Block ownership				-0.003	
				(-1.700)	

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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	12,421	12,421	1,381	11,541	12,421
Adjusted R^2	0.810	0.810	0.886	0.756	0.419
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

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Table IA7. 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 other columns. All regressions include firm and year fixed effects. Standard errors are clustered at the firm and year levels, and *t*-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variables	Log(entertainment and travel costs / number of paid executives)				
	(1)	(2)	(3)	(4)	(5)
D_CSOE×After2009		0.234**	0.230***		
		(2.989)	(3.240)		
D_CSOE×After2012			0.009		
			(0.086)		
Pay_Cut_Large×After2009				0.337***	0.324**
				(3.421)	(2.713)
Pay_Cut_Small×After2009				0.150	0.192*
				(1.467)	(1.959)
Log(total assets)	0.364***	0.348***	0.348***	0.350***	0.225**
	(3.838)	(3.614)	(3.607)	(3.632)	(3.003)
Log(total wages)	0.481***	0.489***	0.489***	0.491***	0.404***
	(5.210)	(5.425)	(5.425)	(5.458)	(5.469)
Number of observations	1,381	1,381	1,381	1,381	1,045
Adjusted R^2	0.890	0.891	0.891	0.892	0.909
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes

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Table IA8. 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 with related parties 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 other columns. All regressions include firm and year fixed effects. Standard errors are clustered at the firm and year levels, and *t*-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 1.

Variables	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_Large×After2009				1.070**	1.111*
				(2.663)	(2.328)
Pay_Cut_Small×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	10,145	10,145	10,145	10,145	7,216
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

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Table IA9. 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 return on sales in columns (9)-(11). All regressions include firm and year fixed effects. Standard errors are clustered at the firm and year levels, and *t*-statistics are reported in parentheses. ***, **, 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)			Return on sales (%)		
D_CSOE×After2009	-0.163**	-0.129**	0.256***	0.260***		0.224**	0.195*		-3.969**	-4.347**	
	(-2.990)	(-2.589)	(3.484)	(4.180)		(2.483)	(1.852)		(-2.552)	(-2.544)	
D_CSOE×After2012		-0.071		-0.010			0.061			0.771	
		(-1.440)		(-0.103)			(0.751)			(0.575)	
Pay_Cut_Large×After2009					0.331***			0.304**			-5.834***
					(3.496)			(2.568)			(-3.303)
Pay_Cut_Small×After2009					0.198*			0.137			-2.195
					(2.203)			(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***	0.255***	0.255***	0.256***	0.948***	0.948***	0.948***	2.767***	2.770***	2.776***
	(9.209)	(9.239)	(3.664)	(3.651)	(3.678)	(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)			0.429***	0.429***	0.430***						
			(5.132)	(5.129)	(5.156)						
Block ownership						-0.003	-0.003	-0.003			
						(-1.590)	(-1.591)	(-1.598)			

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Control-ownership wedge						-0.003	-0.003	-0.003			
						(-0.535)	(-0.537)	(-0.531)			
Tangibility						-0.884***	-0.885***	-0.882***			
						(-4.435)	(-4.447)	(-4.426)			
Sales growth						-0.014	-0.014	-0.014			
						(-0.580)	(-0.574)	(-0.575)			
Leverage						0.706***	0.705***	0.707***			
						(4.949)	(4.951)	(4.957)			
Tax rate						-5.450**	-5.447**	-5.389*			
						(-2.231)	(-2.230)	(-2.218)			
Observations	12,218	12,218	1,348	1,348	1,348	11,455	11,455	11,455	12,218	12,218	12,218
Adjusted R^2	0.665	0.665	0.883	0.882	0.883	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

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Table IA10. 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

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