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Abstract

This study examines the role of executive compensation in public governance. We collect data on corruption cases that involve top-level executives in Chinese listed state-controlled firms. We find a significant positive relationship between underpayment of executives and the likelihood of an investigation into corrupt behavior. We also show that corruption is positively associated with firm performance and that the relationship between underpayment of executives and corruption is influenced by firm performance, suggesting that top managers are more likely to engage in illicit behavior if they are compensated poorly while the firms under their control perform well. Finally, we find that pay-performance sensitivity decreases when top executives are involved in corruption investigations, indicating a lack of pecuniary incentives. Our empirical findings point towards an important relationship between executive compensation and corrupt behavior, thereby providing valuable input to the understanding of executive pay and its effects in China's state sector.

JEL Classification: D73; G38; J30; M52; P30
Keywords: Compensation; Executives; Incentives; Corruption; State sector; China

1 Introduction

Does executive compensation in state-controlled firms have an effect on top executives' inclination towards corrupt behavior? We examine this question in a setting where the state sector plays a very important role, that of the Chinese economy. More specifically, we provide empirical evidence of a significant relationship between executive compensation and the likelihood of corruption investigations into top executives in Chinese state-controlled listed companies. We exploit a unique hand-collected data set on investigations into CEOs and Chairs in Chinese state firms to shed light on how corrupt behavior is tied to individual executive compensation. In addition to a fundamental relationship between the underpayment of top executives and their propensity to engage in illicit activities, we also find evidence that this relationship is dependent on firm performance. For firms that perform well, having an underpaid top executive increases the likelihood of an investigation into possible corrupt behavior.

Incentives for top executives in China's state sector are still not fully understood. For example, previous research has shown that Chinese state-owned enterprises (SOEs) pursue non-financial objectives (e.g. Qian, 1994; Lin et al., 1998; Lin and Tan, 1999; Lin and Li, 2008). These objectives, which are typically called policy burdens and include social objectives such as employment and social stability, have an important impact on firm performance, thus making it more difficult to directly link compensation to performance. Moreover, top executives at SOEs are commonly under strict control by the Communist Party of China (CPC) or the government (e.g. Fan et al., 2007). This complex institutional setting

makes it challenging to analyze incentive mechanisms in Chinese SOEs. However, previous research has shown that there indeed exist important incentive mechanisms for top executives in China's state sector (e.g. Kato and Long, 2006a, 2006b, 2006c; Liao et al., 2009; Feng and Johansson, 2013). Some of these studies have for example highlighted the relationship between firm performance and executive compensation, promotions, and turnover. We contribute to this literature by showing that top executives who manage overperforming firms and are underpaid relative to their peers feel more justified to engage in different forms of corrupt behavior.

In addition to extending the work of previous studies on executive compensation in China's state firms, this study also contributes to the literature on executive compensation and illicit behavior by top managers. Research on executive compensation has typically focused on its potential role in mitigating the agency problem when ownership and management are separated and managers have substantial power over the day-to-day operations of the company (Jensen and Meckling, 1976; Bebchuk and Fried, 2003). Later research has shown that the way compensation is structured may result in corrupt behavior by managers. For example, Benmelch et al. (2010) develop a model in which stock-based compensation induces managers to conceal bad news and take on suboptimal investment policies to support this fraudulent behavior. Closely related to this, a number of studies have identified a significant relationship between equity-based compensation and different forms of corporate and securities fraud allegations (e.g. Burns and Kedia, 2006; Denis et al., 2006; Peng and Röell, 2008; Johnson et al., 2009). We add to this literature by showing that

executive compensation is related to fraud allegations in the state sector in a large transition economy. By providing evidence on how firm performance influences this relationship, we also show that how top executives in China's state sector value their compensation is linked to how well their firms perform. In short, top executives who manage firms that perform well but are not compensated for it seem to find other means to reward themselves.

Finally, this study contributes to the current debate on executive pay at SOEs in China. Not long after Xi Jinping became China's president in 2013, a comprehensive austerity program was launched with the goal of curbing government largess. One important component in that program has been to limit executive compensation and perks at major SOEs (Wall Street Journal, 2014). While this program seems to signify a real effort to curtail corruption in the state sector, it is quite possible that it will have important implications on the behavior of top executives in China's state sector. Our findings suggest that lower executive compensation is linked to a higher propensity for corruption charges. As top executives in the state sector are likely to compare themselves not only to other SOE executives, but also to those who work in the private sector, an overzealous effort to curtail executive pay at large SOEs may have very negative consequences in the form of increased corruption at the highest level throughout the state sector, thus leading to more rather than less corruption overall.

The rest of this paper is organized as follows: Section 2 introduces the institutional setting, focusing on corruption in China and executive compensation in China's state sector. Section 3 introduces the data and discusses the empirical methodology. Section 4 first

presents the empirical results on how executive pay influences the likelihood of corrupt behavior and then discusses the relationship between pay-performance sensitivity and corruption. Finally, Section 5 concludes the paper.

2 Institutional Background

In this section, we first give a brief introduction to the evolution of corruption in China after the beginning of the economic reforms. We then describe the managerial labor market in China's state sector and how the use of managerial incentives has progressed during the economic reform period.

2.1 Corruption in China

Corruption is often linked to different forms of repressive regimes characterized by weak institutions and non-transparent political systems. In the case of China, corruption constituted a significant problem long before the reforms began in the late 1970s. However, as reforms were introduced, corruption increased quickly. Johnston and Hao (1995) argue that the increase in corruption during the 1980s came about as a result of the pre-reform political setting. The dominance of the party-state during the planned economy period meant that the elementary boundaries between markets and official power were very weak at best. Early critiques toward the increasing level of corruption at all levels noted that the reforms "have created incentives for people to enrich themselves, decentralization has given many more people the means with which to do so, and privatization has legitimized personal wealth"

(Johnston and Hao, 1995).[2] Most observers arguably agree with Oi's (1991) notion that it was not the introduction of the reforms per se, but rather the incompleteness of the reforms that lead to the increase in corruption. Basically, the reforms failed to eliminate the corruption opportunities inherent in a planned economy and enabled corrupt practice through the exploitation of a newly established partial market setting.

What is more troublesome, not only for the country as a whole, but perhaps even more so for the CPC, is that corruption continued to expand after the 1980s. The overall incidence of corruption seems to have remained relatively stable during the 1990s, at least in part thanks to a comprehensive anticorruption campaign launched in 1989 (Manion, 2004; Wedeman, 2005). However, as pointed out by several scholars, corruption *intensified* dramatically during the 1990 (e.g. Wedeman, 2004; 2005; Deng et al., 2010). While standard low-level corruption increased at a relatively stable pace, high-level corruption with much larger stakes increased much faster. Empirical evidence thus points toward a spread of corruption upwards into senior ranks of the party regime. This intensification of corruption has several consequences. A direct economic implication is that high-level corruption is potentially much more damaging to the overall economy, as people in high positions are better positioned to expropriate much more significant volumes of funds for their own benefit.

[2]The relationship between fiscal decentralization and corruption is controversial. For more in-depth analyses and discussions on the link between decentralization, see e.g.Deng et al., (2010) and Ko and Zhi (2013)

On the other hand, a political implication is that a widespread corruption at the highest levels may threaten the very legitimacy of the CPC regime (Yu, 2008). It is therefore not difficult to understand the intensified efforts to reign in corrupt practices in recent years. While these efforts began during Hu Jintao's stint as president, the drive against corruption has intensified significantly after Xi Jinping took office. Not only has the number of high-level corruption cases escalated, but a comprehensive austerity program has been put in place with the goal of curbing government largess. Part of this program involves constraining the increasing levels of compensation to top executives in China's state sector.

While corrupt practices are often linked to state officials, corrupt practice constitutes a significant problem among China's SOEs.[3] The perhaps most explicit corrupt practice of managers in state firms is the diversion of assets and profits away from the firms into the hands of the managers themselves. Illicit asset stripping has taken place at a massive scale as firms have become more independent from the state (Ding, 2000). In addition to the direct adverse economic effects of corrupt behavior of managers, this practice has also been linked to social instability in China. A survey in 1997 showed that almost 78% of workers at SOEs felt they benefitted the least from the reforms, and 85% felt that the managers were the biggest beneficiaries (Chen, 2000). The reforms have thus bridged the gap between managers and the rest of the labor force in China's SOEs. The topic of managerial pay is therefore nontrivial in various dimensions.

[3] For examples of corruption cases tied to Chinese SOEs, see Deng et al. (2010).

2.2 Enterprise Reform and the Managerial Labor Market in China's State Sector[4]

The CPC initiated its economic reforms and opening up policy in 1978. As a direct consequence of this shift in policy, the large SOEs that had dominated the Chinese economy during the planned economy underwent significant changes. Between 1949 and 1978, the SOEs were under strict control and the profits and losses made by them were automatically transferred to the state. Top management in these firms did not act independently from the state and were typically acting as direct agents of the CPC. One direct result of this framework was an almost complete absence of individual incentives for executives in SOEs. In the beginning of the reforms, different forms of profit retention schemes were introduced. In addition, instead of mandatory production targets, a below-capacity quota of output was introduced (Mengistae and Xu, 2004). By the end of 1984, both the right to decide output levels and profit retention were implemented by most SOEs (Perkins, 1988).

One important feature of the early SOE reforms was the abolishment of profit remittance into the state budget. Before the reforms, all SOE profits were automatically transferred to the state, leaving little incentive for managers in the state sector to maximize profit. This automatic transfer of profits was replaced by a profit tax at a maximum rate of 55% (Mengistae and Xu, 2004). In effect, this meant that the state relinquished part of its control of SOEs as they were no longer forced to remit all profits to the state and instead had

[4]The discussion in this section is primarily based on Feng and Johansson's (2013) description of China's economic reforms and the labor managerial market in the state sector.

incentives to increase profits as they could be used for different forms of investments, bonus schemes, and welfare benefits.

In the mid-1980s, the Chinese government began to experiment with performance contracts. During the period of 1987-1994, performance contracts became a national policy and a key component of the reform of the SOE sector. A more formal incentive structure for managers was thus implemented through the "contract (management) responsibility program". This program was first introduced in the agricultural sector and later expanded to include medium- and large-sized companies (Xu, 1998; Koo, 1990). In 1987, about 95% of SOEs used some form of contract for its management (Chen, 1995; Choe and Yin, 2000). As pointed out by Liu (1993), the introduction of this program came to be the largest experiment with contractual agreements in history. While still relatively crude, the performance contracts for managers represented a first real effort by the state to formalize contracts that incorporated incentive components (Xu, 1998; Feng and Johansson, 2013).

As noted, the early performance contracts were relatively crude. For example, Firth et al. (2006) identify three flaws in the initial contract system: it encouraged a short-term and myopic behavior of managers; it was still functioning in a planned economic system; and the development of contracts required extensive negotiations at each firm, leading to a significant additional burden for the management at SOEs. In line with this, Perkins (1994) points out that continued reform of the state enterprise sector was high on the CPC's agenda in the mid-1990s.

During the 14th Party Congress in October 1992, it was announced that a socialist market economy and a modern corporate system were going to be established (Sun and Tong, 2003). This marked the fourth stage of the SOE reform process, corporatization (*gongsihua*). A key component at this stage of corporate reform was the concept of *zhuadafangxiao*, or "grasping the large and letting go of the small". This was a strategy that focused the government's efforts on a select number of elite enterprises that were regarded as strategically important and with the intent of supporting them in the effort to become flagship conglomerates (Feng and Johansson, 2013). Correspondingly, the smaller companies were encouraged to find their own way and become more independent of the state (Li, 2001).

In a further effort to improve the management of the state sector, the State-Owned Assets Supervision and Administration Commission (SASAC) was established in 2003 as a result of the consolidation of different ministries. SASAC controls the enterprises that remain under state control and it has the authority to appoint and remove management in these enterprises. SASAC launched a series of campaigns with the intent to recruit personnel of higher quality and to improve evaluation and compensation criteria with the goal of improving managerial quality in the state sector (Naughton, 2004). However, as pointed out by Naughton (2014), it is not clear exactly how top management in the SOEs is handled as CPC's Organization Department has taken control over appointment of management in some SOEs and it is difficult to ascertain how independent SASAC is from the CPC (Naughton, 2004; Feng and Johansson, 2013).

One implication of this institutional framework is that it is difficult to fully grasp the administration of executive compensation and how incentive mechanisms really work in the managerial labor market for the state sector. Recent developments suggest that the CPC is directly involved in this process. For example, and as mentioned earlier, it has been reported that managerial pay and perks at large SOEs will be curbed as part of the austerity program initiated shortly after Xi Jinping became China's new president (Wall Street Journal, 2014). This suggests that even though previous studies have shown that there is a significant relationship between executive pay and firm performance at firms controlled by the state in China, party politics directly influence how executive compensation is handled in the state sector.

3 Data and Methodology

3.1 Data Sample and Variables

We identify a total of 71 cases in which the CEO or Chair of a state-controlled firm was formally investigated by a law enforcement agency such as the Public Security Bureau (typically an arrest) or the Central Committee for Discipline Inspection of the CPC (typically

by way of *shuanggui*[5], or extralegal detention) during the period 2000-2009. Out of these, we are able to collect complete data including information on executive compensation for a total of 66 firms. We then obtain a matching sample composed of 66 firms by comparing the firms in the research sample with other listed firms based on firm size (measured by sales revenues) and industry for a total of three years including the year of the investigation. This means that firms are required to have been listed for at least two years before the year of investigation in order to be included in the sample. Following standard conventions, we also exclude all firms that operate in the financial industry as well as firms with missing financial data. Financial data were obtained from the from the China Security Market and Accounting Research (CSMAR) database, which also lists the ultimate shareholder for all firms.

We use three alternative measures of firm performance in the empirical analysis: return on sales (ROS), return on assets (ROA), and return on equity (ROE). These are calculated by taking the average of each measure two years before, and including, the year of investigation.[6] Compensation is calculated as an average annual salary during the same

[5]The *Shuanggui* process is most often conducted in secret and takes places outside ordinary Chinese law enforcement processes. Subjects under investigation are typically isolated from any form of legal counsel and family visits. For more details, see Sapio (2008).

[6]Using other window periods such as [-2, -1],[-3, -1], and [-3, -2], where time 0 is the year in which the CEO or the Chair comes under investigation, does not change the significance of our results.

period.[7] We also include a number of standard control variables, including: market-to-book ratio, calculated as themarket value of equity divided by the book value of equity; leverage, calculated as total liabilities over total assets; firm size, calculated as the natural logarithm of total assets. When analyzing pay-performance sensitivity, we also include the ratio of state ownership as well as the ratio of independent directors on the board.

To analyze how corruption relates to executive compensation and firm performance, we create a dummy variable *(corrupt)* which is equal to one if a firm's CEO or Chair is under investigation for corruption and zero otherwise.[8] Finally, we want to analyze executive compensation by using a relative measure as we believe that the compensation incentive mechanism for executives in state-controlled firms is based on the premise that executives compare their compensation to those of their peers. We therefore create *underpaid*, a dummy variable for underpayment of executives which is equal to one if the firm's executive compensation is below the sample median and zero otherwise. That is, the underpaid dummy

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[7] As opposed to typical top executives in listed firms in, for example, the U.S., CEOs and Chairs in Chinese SOEs typically own almost no shares in the firms they manage.

[8] While studies on executive compensation in U.S. or European firms typically focus on the CEO, the institutional setting in China is different in that the Chair of board has a significant influence on how the firm operates. The CEO and Char are thus typically the two most influential individuals in Chinese firms. See Feng and Johansson (2013) for a study on executive compensation that similarly focuses on the CEO and the Chair in China.

equals zero only if the firm's CEO or Chair is underpaid relative to CEOs or Chairs at comparable firms.

3.2 Methodology

To analyze how executive compensation and firm performance influences the likelihood of a corruption investigation, we use a logistic regression model with the following specification:

$$\ln\left(\frac{p(corrupt)}{1-p(corrupt)}\right) = \alpha + \beta_1 underpaid_{it} + \beta_2 performance_{it} + \beta_3 underpaid_{it} * performance_{it} + \beta_4 MB_{it} + \beta_5 leverage_{it} + \beta_6 size_{it} + industry + year + \varepsilon_{it}. \quad (1)$$

This logit model estimates the probability that the CEO or the Chair of a state-controlled firm will be put under investigation for potential corruption. The three key explanatory variables are the dummy variable underpaid, firm performance, here measured as the ROA, ROE, and ROS, respectively, and the interaction term of underpaid and performance, respectively. The remaining control variables are the market-to-book ratio, firm leverage, and firm size. Industry and year dummies are included in the regression but not reported for brevity.

In addition to the analysis in which we focus on the likelihood of investigations into corruption, we also conduct a complementary analysis on drivers of corruption and discuss

whether CEOs or Chairs are prone to engage in corrupt activities to compensate for being underpaid while exhibiting a high ability by looking at pay-performance sensitivity. To do this, we run a standard OLS regression with compensation as the dependent variable. The model is specified as seen in Equation (2) below.

$$compensation_{it} = \alpha + \beta_1 performance_{it} + \beta_2 corrupt_{it} + \beta_3 performance_{it} * corrupt_{it} + \beta_4 state\ ownership_{it} + \beta_5 independent\ directors_{it} + \beta_6 MB_{it-1} + \beta_7 leverage_{it} + \beta_8 size_{it} + industry\ dummies + year\ dummies + \varepsilon_{it}. \quad (2)$$

We once more have three key explanatory variables, namely corruption, firm performance (again using three alternative measures ROA, ROE, ROS in separate regression specifications), and the interaction term of the two. Here, our focus ison β_3, as it indicates whether there are significant differences in pay-performance sensitivity between firms with and without corruption cases. If the abilities of CEOs or Chairs are not recognized and considered via an effective compensation mechanism (for example, pay should increase with firm performance for top-level executives), CEOs or Chairs characterized by a high ability and under compensation are more likely to engage in illegal activities to reward themselves. If this is the case, then β_3 in Equation (2) should be negative.

In addition to the control variables from the previous analysis (market-to-book ratio, leverage, and firm size), we also include the ratio of state ownership and the ratio of independent directors on the board as control variables. Finally, we once more include but do

not report industry and year dummies. The analysis of pay-performance sensitivity is not without merit as it can shed light on whether an inappropriate compensation mechanism leads to corruption from another perspective. If it turns out that a poorly designed incentive mechanism brings forth corruption, it will result in adverse effects on not only the top executive with high ability in question, but also for the firm and society at large. It also implies that corruption can be significantly reduced by designing a more effective incentive mechanism.

4 Empirical Results

4.1 Sample Distribution

Panel A in Table 1 presents the number of SOEs and the number of firms with CEOs or Chairs who came under investigation during the sample period. The number of listed SOEs only increased modestly during 2000-2009, mirroring the changes in economic reforms since 1978. The two stock exchanges in Shanghai and Shenzhen were established in 1990 and 1991, respectively.[9] At the initial stage of the development of these exchanges, SOEs dominated the listings. However, over time, privately controlled firms began to play an increasingly important role and new SOE listings slowed down. Looking at the number of firms with

[9]For more details on the establishment and development of China's stock exchanges, see Johansson and Ljungwall (2009).

CEOs or Chairs who came under investigation for corruption during this period, the annual number of such firms is quite evenly distributed throughout the sample. However, during 2004 and 2005, a much higher number of CEOs and Chairs of listed SOEs were being investigated. The third column in the table presents the ratio of such firms to total listed SOEs each year. Firms with CEOs or Chairs under formal investigation constitute a small share of the total number of listed SOEs. On average, such firms represents 0.68% of the total population of listed SOEs and the ratio only exceeds 1% in one year (2005) throughout the sample.

Panel B in Table 1 presents the distribution of firms with CEOs or Chairs under formal investigation for corruption by industry. A few details are worth noting. First, firms led by a CEO or Chair under investigation appear in all industries except for the mining, finance, and communication and cultural industries. These three industries are relatively small in terms of number of firms throughout the sample period. Second, no industry dominates the sample. The share of firms with CEOs or Chairs under investigation ranges from 0 to 1.60% of the total number of firms in a certain industry. Third, manufacturing dominates the sample in terms of number of firms. Out of a total of 10,488 firms, 6,177 were mainly active in the manufacturing sector. In the same sector, a total of 35 cases of formal investigation into the CEO or Chair of the company are identified, thus representing close to 50% of the total sample of corruption investigations. Nevertheless, these 35 cases only constitute 0.57% of the total number of firms in the manufacturing industry. Overall, cases of investigations into

potential corrupt behavior of CEOs or Chairs are thus relatively evenly spread out across time and industries.

[Table 1 Here]

4.2 Descriptive Statistics

Table 2 presents the descriptive statistics for the main variables for firms in the research and control samples. To get an initial understanding of the differences between the two firm samples, we provide simple tests for differences in the mean and media. All three operating performance measures exhibit differences across the two samples. The difference in ROS is not significant. However, the difference is significant in both the mean and median for ROA and ROE. For these measures, the research sample exhibit a high operating performance compared to the matching sample.

There is no significant difference in the mean and median of the control variables market-to-book equity ratio, leverage and size. More importantly, when we look at compensation, the annual average compensation was 89,548 renminbi (RMB) in the research sample, and 118,168 RMB in the matching sample. The difference in compensation is significant for both the mean and median. This finding provides a first indication that lower executive compensation correlates with investigation into corrupt behavior of top executives in Chinese SOEs.

[Table 2 Here]

4.3 Are Underpaid Executives Linked to a Higher Likelihood of Corruption?

We first focus our empirical analysis on potential drivers of the likelihood of investigation into corrupt practices of top executives. Running the logistic regression presented in Equation (1), we obtain the results shown in Table 4. Again, the dependent variable is the dummy variable for corruption investigation. The three main explanatory variables of interest are underpaid, performance and their interaction variable, respectively. The coefficient for underpaid is positive and significant at the 1% level. Since the underpaid variable is constructed so that 1 indicates compensation below the median and 0 above the median, a positive coefficient means that a lower compensation for top executives is positively related to a higher likelihood for an investigation into potentially corrupt practices. Moving on to the second important explanatory variable, we find that firm performance is also positive and significant at the 1% level. This result suggests that top executives in the Chinese state sector who outperform their peers are more likely to be investigated for corruption.

Third, and more importantly, the interaction term for underpaid and performance is positive and significant for two of the three performance measures. This finding suggests that top executives who are underpaid relative their peers and who also performs well are more likely to be investigated for corruption. In other words, CEOs or Chairs who show that they are more capable than average in terms of managing their company and still are compensated less feel that they are underappreciated and are therefore more prone to engage in illicit

activities for their own gain. Finally, out of the remaining control variables, only leverage is significant. The sign of its coefficient suggests a positive relationship between leverage and the likelihood of an investigation into corruption.

Overall, these results points toward an important relationship between the relative level of compensation and the likelihood of corrupt behavior on part of top executives in the Chinese state sector. We have also established that the ability of the top executive act as a driver of this relationship. These findings contribute to the previous literature on incentives for top management in Chinese SOEs (see Feng and Johansson (2013) for a detailed discussion on the incentive mechanisms for such firms). While previous studies have provided evidence of a significant relationship between firm performance and executive compensation, we believe that our findings are the first to point toward the potentially negative impact resulting from underpaid top executives in SOEs and also link this effect to the ability of these executives.

[Table 3 Here]

4.4 Pay-Performance Sensitivity and Corruption

As noted in Section 2.2, a relatively large body of literature has analyzed the relationship between performance and compensation in China's state sector. Several of the previous studies in this area have shown that performance indeed functions as a significant driver of executive compensation not only in the private sector, but also among SOEs (e.g. Mengistae and Xu, 2004; Feng and Johansson, 2013). The starting point of the analysis in

this section is therefore that firm performance is a key explanatory variable for executive compensation, i.e. that there exists a nontrivial pay-performance sensitivity also in China's state sector.

The results of the OLS regression based on the model in Equation (2) are presented in Table 4. As expected based on earlier research on China's state sector, we find that performance is significantly and positively associated with executive compensation, indicating the existence of a significant pay-performance sensitivity. This initial finding lends further support to the literature on pay-performance sensitivity for top executives in China's state sector. Moving on to the other important explanatory variable for this study, we find that investigations into corruption among top executives has a negative effect on executive compensation, further corroborating that corrupt CEOs or Chairs are underpaid. This result holds up for all three alternative measures of firm performance. Moreover, the interaction term of performance and corruption is significant and negative. This result suggests that the pay-performance sensitivity is lower for firms with corruption cases compared to firms in the matching sample. That is, the incentive mechanism based on the pay-performance is not provided to firms involved in a corruption investigation, at least for CEOs or Chairs who perform well relative to their peers.

It is worth noting the result for some of the remaining explanatory variables. First, the state ownership ratio is not significantly related to compensation, suggesting that as long as the state is the controlling shareholder, it does not matter for executive compensation how much of the firm the state actually owns. Second, the independent directors ratio is positive

and significant at the 1% for all three model specifications. This suggests that the incentive mechanism of executive compensation tied to firm performance in China's state sector becomes more important as the state brings in independent experts to sit on the board. Finally, the market-to-book equity ratio and firm size are significant and positively associated with compensation. These findings are in line with most of the previous studies on executive compensation in China's state sector.

[Table 4 Here]

5 Conclusion

In this paper, we provide evidence that the likelihood of a CEO or Chair in China's state sector coming under investigation for corruption is directly related to his or her compensation. Our findings contribute to the existing literature on executive compensation in China's state sector as well as to previous research on corruption by top executives in SOEs. We first show that the more top executives are underpaid relative to top executives at comparable firms, the more likely it is that they become the target of a corruption investigation. In addition, we provide evidence that this relationship is tied to firm performance. Underpaid top executives at firms characterized by superior performance are more likely to be investigated for corruption. We also find that executive compensation is negatively related to investigations into corruption and that this relationship is also tied to firm performance. Supporting previous studies on pay-performance sensitivity in China's state sector, we find that firm performance is strongly related to executive compensation. However, and more importantly, we find that

the relationship between executive compensation and firm performance weakens significantly if an investigation into potential corruption among top executives takes place. Thus, while the relatively modest number of observations of investigations into corruption prevents us from expanding the analysis, it is sufficient for us to provide evidence that underpaid but highly qualified executives are more prone to engage in corrupt activities.

In addition to the contributions to the burgeoning literature on behavior among top executives in the state sector, we also contribute to the ongoing policy debate that focuses on managerial pay in the Chinese state sector. Recent developments suggest that a popular argument in China is that managerial pay in the state sector is too high. One implication of our findings is that while a more market-oriented process for compensation may result in higher managerial pay, it may also have important effects on the likelihood of top executives engaging in illicit acts. The relationship between managerial pay and corrupt behavior that we identify in this study thus needs be taken into consideration when analyzing the total effects of different levels of compensation.

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Table 1 Sample

Panel A: Distribution of firms with a CEO/Chair under investigation for corruption by year

This panel presents the distribution of CEOs or Chairs in state-controlled listed firms who are under investigation for corruption by year during the period 2000-2009. Investigated for corruption indicates that the CEO or Chair is formally investigated by a law enforcement agency such as the Public Security Bureau (typically an arrest) or the Central Committee for Discipline Inspection of the CPC (typically by way of *shuanggui*, or extra-legal detention).

	Number of listed state-controlled firms	Firms with CEO/Chair under investigation for corruption	
		Number	As percentage of SOEs (%)
2000	992	5	0.504
2001	1041	2	0.192
2002	1072	8	0.746
2003	1074	7	0.652
2004	1086	10	0.921
2005	1057	20	1.892
2006	1030	5	0.485
2007	1031	6	0.582
2008	1050	4	0.381
2009	1055	4	0.379
Total	10488	71	0.677

Table 1 Sample (continued)

Panel B: Distribution of firms with a CEO/Chair under investigation for corruption by industry

This panel presents the distribution of CEOs or Chairs in state-controlled listed firms who are under investigation for corruption by industry, classified by CSRC industry standards during the period 2000-2009. Investigated for corruption indicates that the CEO or Chair is formally investigated by a law enforcement agency such as the Public Security Bureau (typically an arrest) or the Central Committee for Discipline Inspection of the CPC (typically by way of *shuanggui*, or extra-legal detention).

Industry by CSRC classification	Number of listed state/controlled firms	Firms with CEO/Chair under investigation for corruption	
		Numbers	As percentage of SOEs (%)
Agriculture, forestry, livestock farming and fishery	169	2	1.183
Mining	193	0	0.000
Manufacturing	6177	35	0.567
Utilities	647	6	0.927
Construction	184	2	1.087
Transportation	533	4	0.750
Information Technology	372	4	1.075
Wholesale and retail trade	713	6	0.842
Finance	100	0	0.000
Real estate	312	3	1.603
Social Services	341	5	0.015
Communication and Cultural Industry	72	0	0.000
Miscellaneous	675	4	0.593
Total	10488	71	0.677

Table 2 Descriptive statistics

This table presents descriptive statistics for the research and matching sample. The research sample is composed of firms with a CEO or Chair who is under investigation for corruption. Matching firms are of similar size, measured as sales, in the same industry as the firms they are matched with in the research sample. We identify a total of 71 cases of investigations into corruption during the period. We were then able to collect data for all the variables needed for the empirical analysis for a total of 66 firms, which therefore is the final number of firms in the research sample. The matching sample includes the same number of firms. Return on sales (ROS) is measured as net income over total sales, return on assets (ROA), is measured as net income over total assets, and return on equity (ROE) is measured as net income over shareholders' equity. Compensation is the executive salary in the company. The Market to book equity ratio is measured as the market value of equity divided by the book value of equity. Leverage is the ratio of total liabilities over total assets. Size is the natural log of total assets. All variables are measured by taking the average annual during the period of two years before and the year in which the corruption investigation is initiated. All variables are winrsorized at top and bottom 1%. *** ,** and * denote significance for the difference between the research sample and matching sample at 1%,5% and 10% respectively.

	Research Sample				Matching Sample		
	N	Mean	Median	Std. Dev	Mean	Median	Std. Dev
ROS	71	0.111	0.099	0.175	0.133	0.076	0.168
ROA	71	0.050**	0.047***	0.058	0.033	0.028	0.036
ROE	71	0.086**	0.090***	0.088	0.060	0.052	0.054
Compensation	66	89548.66**	65109.23***	77460.90	118168.88	101611.38	55323.49
Market to book equity ratio	71	4.086	3.732	2.575	3.848	3.385	2.179
Leverage	71	0.444	0.445	0.168	0.414	0.411	0.145
Size	71	21.045	21.042	0.904	21.111	21.060	0.825

Table 3 Executive compensation and corruption investigations among SOEs

This table presents the effects of compensation incentive and firm performance on corruption investigations among SOEs. The research sample consists of 66 firms in which the CEO or Chair underwent an official investigation for corruption sometime during the period 2000-2009 and for which data for managerial compensation were available. The control sample consists of 66 firms of similar size, measured as sales, in the same industry as that of the respective firms in the research sample. Here, the dependent variable *Corrupt* is a dummy equal to one if the CEO or Chair was investigated and zero otherwise. The independent variables are: *Underpaid*, a dummy variable which equals one if the executive compensation is below the sample median and zero otherwise; *Performance*, a dummy variable which equals one if the firm's operating performance(ROA in Model I, ROE in Model II, and ROS in Model III) is above the sample median and zero otherwise; *Underpaid*Performance*, the interaction term of the compensation and performance dummies; *Market to Book Equity Ratio*, measured as the market value of equity divided by the book value of equity; *Leverage*, the ratio of total liabilities over total assets; *Size*, the natural log of total assets Industry and year dummies are included but not reported. Logistic regressions are used and Wald chi-square are presented in parentheses. All variables are winsorized at 1% and 99%. ***,**,and * denote significance at 1%,5% and 10% respectively.

Dependent variable: Corrupt	Model I (ROA)	Model II (ROE)	Model III (ROS)
Underpaid	1.916***	1.884***	1.862***
	(8.141)	(8.272)	(8.744)
Performance	2.489***	2.072***	1.371***
	(12.404)	(11.196)	(3.573)
Underpaid*	1.314	0.868*	0.895*
Performance	(2.368)	(2.83)	(3.110)
Market to book	-0.031	-0.052	0.016
Equity ratio	(0.063)	(0.190)	(0.019)
Leverage	4.421***	2.456*	3.569***
	(7.429)	(2.698)	(4.707)
Firm Size	-0.268	-0.323	-0.025
	(0.505)	(0.713)	(0.005)
Industry and Year Dummy	Yes	Yes	Yes
Intercept	2.576	4.582	-2.130
	(0.0962)	(0.297)	(0.0751)
Observations	132	132	132
Likelihood Ratio Test	152.351	152.376	165.434

Table 4 Pay-performance sensitivity- the role of corruption

This table compares the pay performance sensitivity for SOEs, divided into a research sample firms and a control sample. The research sample consists of 66 firms in which the CEO or Chair underwent an official investigation for corruption sometime during the period 2000-2009 and for which data for managerial compensation were available. The control sample consists of 66 firms of similar size, measured as sales, in the same industry as that of the respective firms in the research sample. Here, the dependent variable *Compensation*, the executive compensation in the firm, divided by 10^6. The independent variables are: *Corrupt*, a dummy equal to one if the CEO or Chair was investigated and zero otherwise; *Performance*, the firm's operating performance (ROA in Model I, ROE in Model II, and ROS in Model III); *Corrupt*Performance*, the interaction term of the corruption and performance; *State Ownership*, measured as the state shareholding ratio; Independent directors ratio, measured as the ratio of independent directors on the board; *Market to Book Equity Ratio*, measured as the market value of equity divided by the book value of equity; *Leverage*, the ratio of total liabilities over total assets; *Size*, the natural log of total assets All independent variables are lagged one year. Industry and year dummies are included but not reported. OLS regressions are applied and robust *t*-tests are given in parentheses. All variables are winsorized at 1% and 99%. ***,**,and * denote significance at 1%,5% and 10% respectively.

Dependent variable: Compensation	Model I (ROA)	Model II (ROE)	Model III (ROS)
Performance	1.146**	0.413**	0.141*
	(2.23)	(2.01)	(1.77)
Corrupt	-0.226*	-0.229**	-0.209**
	(-1.92)	(-2.12)	(-1.97)
Performance*Corrupt	-0.783**	-0.415***	-0.148*
	(-2.18)	(-3.13)	(-1.81)
State Ownership ratio	-0.004	-0.004	-0.004
	(-1.15)	(-1.20)	(-1.05)
Independent directors	1.743***	1.722***	1.750***
ratio	(4.41)	(4.32)	(4.45)
Market to book	0.013**	0.014*	0.014**
Equity ratio	(1.97)	(1.79)	(2.10)
Leverage	0.576	0.307	0.322
	(1.53)	(1.18)	(1.27)
Firm Size	0.177***	0.188***	0.226***
	(3.62)	(3.87)	(4.29)
Industry and Year Dummy	Yes	Yes	Yes
Intercept	6.892***	6.868***	6.032***
	(7.18)	(6.89)	(5.59)
Observations	350	350	350
Adjusted R squares	0.273	0.271	0.277