Internal Control and Corruption: Evidence from Chinese State-owned Enterprises

Wei SHU*
Xi'an University of Finance and Economics
Sun Yat-sen University

Zhuquan WANG
Ocean University of China

Can ZHAO
Ocean University of China

Ying ZHENG
Sun Yat-sen University
Email:zhengy26@mail.sysu.edu.cn

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Abstract:

This paper investigates the effectiveness of internal control quality on corruption activities by managers using a sample of Chinese state-owned enterprises. Our empirical evidence shows that firms with high-quality internal controls are associated with less corruption activities, measured as scandal possibility and PERK. We further find that the role of internal controls on corruption activities depends on the managerial power. Our findings provide evidence that internal control quality can play a positive role in firm value in concentrated ownership structures and in emerging markets.

Keywords: Internal Control, Corruption, State-owned Enterprise, Managerial Power
JEL：M41，G38，G30

1. Introduction

Corruption[1] is significant and pervasive around the world which attracts considerable attention from both academic researchers and practitioners. In China, dozens of senior executives in State-owned enterprises have been investigated on corruption charges in the first round of an inspection in 2015 by the country's top anti-graft authority[2]. Prior studies document that corruption constitutes a severe obstacle to investment, innovation, and economic growth (e.g., Fishman and Svensson, 2002; Murphy et al., 1993; Mauro, 1995; Mo, 2011; Swaleheen, 2011). Therefore, it is essential to examine the mechanisms to reduce the corruption activities. Our study proposes that internal control system is one of efficiency methods to constrain the corruption activities in the weak institution environment. Specifically, we investigate whether and how a better internal control environment constrains the "corruption" activities of managers in Chinese state-owned enterprise. Managers' corruption activities in Chinese state-owned enterprises are an appropriate setting for examining the effectiveness of internal control systems on corruption at firm level.

As indicated by Chinese COSO, the important purpose of internal controls is to guard the safety of state-owned assets, to reduce corruption activities, and to improve firm efficiency by implementing an internal control system. Thus, the subject of internal control is of practical importance here and a better internal control environment has the potential to limit corruption activities. First, for firms with weak internal controls, it is difficult to detect corruption (e.g., related transactions for channeling state assets to managers' own companies) risk and implement related control activities. Second, firms with strong internal controls could improve the information environment and disclosure quality, which could help reduce the opportunistic behavior (i.e.,

[1] Corruption, in our paper, is defined as public corruption, that is, misuse of public power for private gains.

[2] The news comes from Chinadaily website:
http://www.chinadaily.com.cn/china/2015-05/05/content_20621017.htm.

bribes from counterparties) of empowered managers. Third, internal control procedures and documentation leave managers in difficult positions to engage in corruption activities. Therefore, we hypothesize that a better internal control environment is associated with a low possibility of managers' corruption activities in SOEs. Using the sample of state-owned Chinese listed companies, we examine the role of sound internal controls and their ability to reduce the possibility of corruption.

Based on the internal control integrated framework developed by COSO, an internal control environment includes five components or elements of internal control: the control environment, risk assessments, control activities, information and communications, and monitoring. In this paper, we measure the internal control quality at the aggregate level instead of the internal control quality over financial reporting. We obtain an internal control quality measure from the Dibo database，which is based on the quality index of the five elements of an internal control system with an adjustment of internal control deficiencies. In addition, we measure corruption activities from two perspectives to capture the behaviors that managers use their power delegated by state shareholders to pursue private benefits. The first corruption measure (Revealed corruption) is to capture managers' activities sanctioned by government authorities such as Chinese Securities and Regulation Committees (CSRC) and legal courts. The second corruption measure (Hidden corruption) is (abnormal) managerial perks, which focus on managerial on-the-job consumption as well as managers' private benefits. Using the sample from the period of 2007 to 2012, our empirical results show that firms with better internal controls are associated with a low possibility of managers' corruption activities. Specifically, firms with strong internal controls are negatively related with the revealed corruption activities of managers. Additionally, high-quality internal controls curtail consumption perks by managers in SOEs.

To further understand the role of internal control on corruption, we

investigate whether the relation between the internal control quality and managers' corruption activities depend on managerial power. Managerial power refers to the extent that top managers (i.e., CEO) have the ability to affect the decision-making process and the related monitoring function of corporate governance. Our empirical evidence shows that better internal control plays a more pronounced role in reducing corruption activities in SOEs when managerial power is weak. These findings suggest that managerial power is essential to the effectiveness of internal control systems.

We check the robustness of empirical results using a number of sensitivity tests. First, we separate the full sample into two groups based on the regions' marketization index and find similar results for both groups. Our results are robust with respect to the investor protection level. In addition, to mitigate the self-selection bias problems, we estimate a two-stage Heckman selection regression and obtain similar results. Finally, results are robust to alternative proxies for dependent variables (i.e., Perks) and alternative proxies for independent variables (i.e., managerial power).

Selecting China as the area of study is meaningful in the following aspects. First, an important characteristic of the Chinese corporate governance system is that listed firms have highly concentrated ownership, particularly with local government and central government as the ultimate owners. In addition, government and state-owned enterprises continue to play an important role in the Chinese economy. Thus, misallocation of resources in SOEs would cause severe economic consequences for the entire economy. Second, corruption refers to the abuse of public power by individuals for their own personal benefit because such individuals, mainly government officials, have such public power. However, in China, top executives of Chinese SOEs always have an administrative level[3], and such administration treatment

[3] In 2006, regulation on job switches between executives in SOE and government official indicate that there is career path between top executives of SOEs and government officials. The top executives of state-controlled Chinese firms are not totally professional managers recruited from the free labor market (Chen et al. 2013). Instead, they are quasi-bureaucrats and enjoy different levels of administrative ranks

provides executives with public power to abuse. Third, legal enforcement in China continues to be weak. Managers in SOEs anticipate less punishment when they misappropriate state-owned assets for their own benefits. As reported, corruption activities by managers in SOEs are astonishing. For example, there are as many as 44 executives of state-owned enterprises who were arrested for corruption in China from January 1, 2014 to June 23, 2014. Thus, the situation that managers have more opportunities to expropriate the shareholders is an appropriate setting for examining the effectiveness of governance mechanisms, such as an internal control system.

Our study enriches the current literature on corruption. Many economics and finance studies have modeled and empirically tested how corruption affects investment and economic growth at a macro level focusing on the corruption of government officials (Murphy et al., 1993; Mauro, 1995; Shleifer and Vishny, 1993). However, there is limited evidence on corruption issues at firm level. Taking advantage of special arrangement of SOEs' managers, our study complements current research on corruption by studying the corruption activities and its determinants at a firm level.

Our study contributes to the stream of literature on the economic consequence of internal controls. In the accounting literature, the growing importance of internal control systems and the SOX Act has prompted numerous studies examining how sound internal controls add value to firms and shareholders (e.g., Ashbaugh-Skaife et al, 2007; Goh and Li, 2011; Cheng et al., 2013; Doyle et al., 2007a). Our paper extends this line of research by providing evidence that internal controls can play a role in other activities in addition to financial reporting. Most prior research focuses on the role of internal controls to mitigate intentional errors and unintentional errors in financial reporting. Although internal control frameworks explicitly indicate the role of internal controls in operating efficiency and safeguarding assets,

within the Chinese Government.

there is little research on the effectiveness on operating efficiency, except for Cheng et al. (2013) and Feng et al. (2013). From the perspective of operating efficiency, our paper shows the effectiveness of internal controls on misconduct other than financial reporting, that is, corruption activities by managers in SOEs. Our findings extend and complement prior studies on internal control by providing a channel to explain the association between the internal control quality and the operating efficiency: reducing the misappropriation of resources by managers.

Another insight gained from our study is that internal controls are important mechanisms to mitigate severe agency problems even under a concentrated ownership structure and in a weak institution environment. ~~because~~Because of SOX, many emerging markets attempt to implement the internal control requirement in listed firms. However, the effectiveness of internal controls in a weak institutional environment is not inclusive. China, as a large emerging market, is representative, and empirical results based on Chinese data on internal control can be generalized to other emerging markets with regards to weak investor protection as well as concentrated ownership structures.

The remainder of this paper proceeds as follows. Section 2 discusses the institutional background of the internal control system in China and develops hypotheses relating internal control and the corruption activities of managers in SOEs. Section 3 describes the sample selection procedures, definitions of key variables, descriptive statistics, and research design. Section 4 presents regression results on the relation between internal control quality and misconduct by managers. The robustness checks are discussed in section 5. We draw conclusions in Section 6.

2. Institution Background and Hypothesis development

2.1 Internal Control System in China

Over the past three decades, China's firms have experienced many

economic reforms in addition to high economic growth. Beginning in the early 1990s, China started to deepen the reform of its state-owned enterprises (SOEs) by establishing two national stock exchanges, the Shanghai Stock Exchange and the Shenzhen Stock Exchange. The Chinese stock market was organized by the government as a vehicle for its SOEs to raise capital. To help install elements of market discipline on SOE managers, a number of regulations have been implemented to address problems. The first regulation to address internal control problems, "Independent Auditing Standard No.9-Internal control and audit risk" issued by the Ministry of Finance, was launched in December 1996. Since then, a series of regulations on internal control have been issued.

Before 2006, internal control regulations in China focused more on internal control than financial reporting. Because of the SOX Act, the Chinese government reexamined the internal control regulation of listed companies and focused on the internal control systems throughout companies in 2006. For example, Shanghai Stock Exchange issued the "Listed Firms' Internal Control Guidelines", which define internal control as "internal control refers to company's regulation and institutional arrangements to fulfill company's strategic missions by controlling the company's risks throughout the business activities". Furthermore, "Internal Control Framework" was issued in 2008, and this regulation has recommended listed companies implement internal control system since 2009[4]. This regulation in China is also referred to as the China SOX Act. The China SOX Act is the foundation of China COSO and improves the internal control practices in listed companies significantly. As indicated by Chinese COSO, the important purpose of internal controls is to guard the safety of state-owned assets, to reduce corruption activities, and to improve firm efficiency by implementing an internal control system. Similar

[4] As planned, listed companies will implement the internal control system in 2009. However, actually listed companies carry out the internal control system with classification. The first group to implement the internal control system is composed of 68 listed firms with both A shares and H shares and 261 pilot companies since 2011. The second group is composed of listed companies in main board since 2012.

to COSO, the internal control system in China is also composed of five elements, including the internal control environment, risk assessment, control activities, information and communication, and internal monitoring.

2.2 Literature Review and Hypothesis development

Prior research documents the positive relation between high-quality internal control and the reliability of financial reporting since Section 404 of SOX Act took effect. Doyle et al. (2007a) find that weak internal controls are associated with relatively low-quality accruals. For the accrual quality of financial reporting, Ashbaugh-Skaife et al. (2008) further find that firms with weak internal controls have lower quality accruals with regards to unintentional errors. Feng et al. (2009) document a positive relation between the internal control quality and the accuracy of management forecast. Their results suggest that internal controls can reduce errors in internal management reports. Goh and Li (2011) find a positive relation between the internal control quality and conservatism. Skaife et al. (2013) find that the profitability of insider trading is significantly greater in firms with material internal control weaknesses relative to firms with effective control. Our study differs from their studies by examining the corruption activities, which is of concern to both shareholders and the public.

Corruption activities by empowered managers in SOEs have serious economic consequences. At a macro research level, many researchers document the negative relation between economic growth and corruption (e.g., Murphy et al., 1993; Mauro, 1995; Mo, 2011; Swaleheen, 2011)[5]. At the firm level, corruption activities generate a negative impact on firms' performance and firms' growth in both the short-term and the long-term (Fisman and Svensson, 2007; Rosa et al., 2010). For private benefits, managers

[5] In the current literature, there are two views on the relationship between economic growth and corruption. One is "helping hand", which means that corruption help firms overcome the institution deficiencies. The other one is "grabbing hand", which refers that beaucrats use public resources to grab benefit for themselves instead of social benefit.

would even spend resources on negative NPV projects. In addition, managers would cut research and development expenses, which support firm's long-term growth, and transfer resources to their own pockets. In addition, corruption activities by managers could generate negative spillover effects into other management or employee behavior; this would reduce their efforts in productive activities and pursue rent-seeking activities. In China, managers' corruption activities are widespread because of weak legal enforcement. As reported, there are as many as 44 executives of state-owned enterprises who were arrested on corruption charges in China from January 1, 2014 to June 23, 2014. In the corruption cases, most CEOs and Chairmen of the board were involved in the corruption [6] because of a lack of or weak corporate governance in addition to double-agency problems.

In our paper, we propose that the internal control system can play an effective role in constraining managers' corruption activities. A better internal control environment has the potential to limit corruption activities. First, an internal control environment element integrates internal controls into daily operations and into the corporate culture. This type of corporate environment could reduce the managers' incentive to engage in misconduct. That is, a high-quality control environment establishes the importance of internal control throughout the firm. Second, because of industry and firm characteristics, companies have their own weak nexus prone to corruption. Corruption activities include insider trading, the illegal occupation of a company's asset, and misappropriation of state assets to deliver benefits through related party transactions. Better internal controls will help companies to identify such corruption-related risks, and targeted control activities and supervision will hinder corruption at the early stage. Third, a control activity requires companies to develop policies and procedures related to their various business activities. For example, better internal

[6]The news comes from http://news.xinhuanet.com/legal/2014-06/24/c_126665800.htm.

controls will pre-assess the main risks in addition to related party transactions and will implement a documentation procedure along the related party transaction chain; this will facilitate future double-checks. Those procedures increase the possibility of detecting the misbehaviors of managers. In addition, better internal controls make business transactions more transparent to related parties. Information transparency facilitates the largest shareholders and related stakeholders in their monitoring of managers and reduction of the misconduct. Finally, the monitoring activities of internal control systems require companies to supervise and separate the power of managers in the major financing and investing activities. In addition, internal control is practice of importance here with comparisons with other corporate governance mechanisms discussed in prior research. For instance, corporate governance such as board composition (e.g., independent directors and expertise) is strategic level monitoring, whereas an internal control system is integrated into day-to-day operations with regards to monitoring managers. Therefore, internal control systems could reduce the managers' ability and incentive to abuse state-owned assets for their private benefits.

In a summary, we develop the first hypothesis as follows:

H1: Firms with better internal control systems are negatively associated with the corruption activities by managers in SOEs.

However, there are countervailing forces that could make internal control systems useless for reducing the misappropriation of assets by top management. As indicated, the COSO conceptual framework explicitly states, "Even an entity with an effective system of internal control may have a manager who is willing and able to override internal control. The term "management override" is used here to mean overruling prescribed policies or procedures for illegitimate purposes with the intent of personal gain or an enhanced presentation of an entity's performance or compliance." The

possibility of "management override" is directly related to managerial power in the company because managers have more power to do so.

Managers' corruption activities are a ramification of severe double agency problems because SOEs do not have a "true" owner to protect his interest (Fan et al, 2010). In the agency problem framework and the managerial power theory, managers have more ability to pursue private benefits when managerial power is strong (e.g., Bebchuck et al., 2002; Finkelsterin, 1992; Bebchuck and Fried, 2004). Prior studies (e.g., Lewellyn and Muller-Kahle, 2012) also show that managerial power will jeopardize the effectiveness of corporate governance mechanisms, such as boards of directors (Hermalin and Weisbach, 1998; Fracassi and Tate, 2012), compensation contracts and forced turnover (Chen et al., 2011; Morse et al., 2011). The situation could worsen in the scenario of inefficient legal enforcement and weak investor protection, as in China. For example, Chen et al. (2006) find that a board of directors does not deter corporate fraud in China. In addition, Park et al. (2004) also provide evidence that adding independent directors does not deter earnings management, if ownership is highly concentrated. Therefore, managers with strong managerial power would make the designed high-quality internal control useless for monitoring their behavior. We propose the second hypothesis as follows.

H2: The relation between internal control quality and managers' corruption activities depends on the level of managerial power.

3. Research Design and sample selection

3.1 Definition of corruption activities by managers

To test our hypothesis, we use two different dependent variables to measure the extent that managers conduct corruption activities. The one measure is the revealed corruption (*Revealed_Corrupt*) when managers violate regulations and laws. When this type of revealed corruption occurs, as a

consequence, managers would be punished by law. The corruption events from 2007 to 2012 are obtained from the China Regulatory Enforcement Research Database of the China Stock Market and Accounting Research (CSMAR), which includes financial and nonfinancial corporate scandals. According to public corruption literature, we solely classified the following activities as corruption activities, and these include the unauthorized use of funds and assets, kickbacks in procurements, and bribery (see Appendix A for corruption type and distribution). Because of the incompleteness of the CSMAR database, we also manually collect corruption information from the website (www.baidu.com) using corruption-related keywords [7]. The corruption year is then defined as the year that corruption occurs; this is in contrast to the disclosure year that corruption activities are revealed by listed firms, or by government authorities, or by the media press[8]. The basic criteria for a corruption year is that we trace back to the year the corruption occurred. Therefore, the revealed corruption (*Revealed_corrupt*) is a dummy variable, which equals 1 if there corruption activities occurred in that year for firms, otherwise zero. Finally, we obtain 206 firms with corruption events and sufficient financial and internal control information.

The other measure is the hidden corruption (Perk) when managers enjoy job consumption. Cai et al. (2011) proposed a novel approach to identify the corruption from the entertainment expenditure items in the annual reports. This type of hidden corruption technically does not break the law, although those activities would hurt shareholders. Compared to the revealed corruption, job consumption presents more severe problems in Chinese SOEs. That is, those expenditure are widely believed to be corrupt, and in 2012

[7] We use search engine to find information with any possible combination of the keywords and The keywords used for listed firms are "executives corruption", "executives crime", "executives interrogation", "executives investigated", "executives bribery", "violation of regulations", "executives sentence". We carefully read the each related news to identify whether the executives are punished for corruption activities.

[8] We present an example here to illustration how we define the corruption year. Managers of a listed company are punished in 2010 because of their corruption activities in 2007 and 2008. In our study, year 2007 and 2008 is defined as the year of corruption occurrence instead of year 2010.

Chinese government issue new regulation (called "Eight provisions" [9] and "six prohibitions") to constrain perk consumption by SOEs' managers. In accordance with Cai et al. (2011) and Chen et al. (2013), we use two methods to calculate managers' perks. First, based on cash flow statement information, perks are defined as the total amount of managerial perquisites and the aggregate of the following eight expenses: office expense, business travel expense, business entertainment expense, communication expense, training abroad expense, board meeting expense, company car and chauffer services, and meeting expense. The second measure of perks is the aggregate of the following five expenses: business travel expense, business entertainment expense, communication expense, training abroad expense, and company car and chauffer services. The reason we exclude office expense, board meeting expense, and meeting expense is whether these three expenses capture managerial perks is highly debatable. Thus, the hidden corruption (PERK) is defined as the aggregate amount of eight (five) expenses in the cash flow statement divided by total sales. We hand collected these expense items from the cash flow statement[10] for listed companies over the period 2007 to 2012. Finally, we obtained 2929 firm-year observations with detail for the eight expenses and sufficient financial and internal control information. Because there is a formal format for disclosure of these eight expenses, certain enterprises did not disclose the eight expenses individually, but reported the expense as a combination of two or three expense items. Such disclosure practices cause problems in calculating the total amount of the five perk-related expenses because we need the individual amount for office expenses, board meeting expenses, and meeting expenses. When we calculate the total of the five expenses, we delete the sample firms that did not disclose

[9] On December 4, 2012, Xi Jinping, General Secretary of the CPC Central Committee, presided over the meetings of the Political Bureau of the CPC Central Committee that resulted in the issuing of explicit requirements on how members of the Political Bureau should improve eight aspects of their work approach, including rejecting extravagance, formalism and bureaucratism.

[10] Listed firms disclose eight expenses items in cash flow statement voluntarily. Whereas, about 75% of stated-owned enterprises disclose those expenses information in notes to cash flow statement in 2012.

office expense, board meeting expense, and meeting expense individually. Finally, we obtain 2709 firm-year observations.

In combination, these two types of corruption activities would provide us with the big picture of corruption activities and the role of internal control quality. Furthermore, we carefully discuss the measurement issues of perk in sensitivity tests because there is a concern whether perk is a proper proxy for corruption activities in our setting.

3.2 Research design

We estimated the following cross-sectional regressions (Model 1) using robust standard errors to test the hypothesis that high-quality internal control could constrain corruption activities by SOE managers. The models are specified as follows.

$$\begin{aligned} Corruption = {} & \alpha + \beta_1 IC_{i,t} + \beta_2 Power_{i,t} + \beta_3 Size_{i,t} + \beta_4 ROA_{i,t} + \beta_5 Lev_{i,t} \\ & + \beta_6 Largest_{i,t} + \beta_7 Big4 + \beta_8 Central + \beta_9 Marketization_{i,t} \\ & + \beta_{10} Compensation_{i,t} + \beta_{11} \sum Industry + \beta_{12} \sum Year + \varepsilon_{i,t} \end{aligned} \quad (1)$$

Where, *Corruption* presents variables that measure the extent of corruption activities by managers. In our paper, we measure corruption as *Revealed_corrupt* and *PERK*. When *Revealed-corrupt* is a dependent variable, the Logit model is estimated on two different samples. The first sample is a pooled sample of listed companies with sufficient data. For the pooled sample, we assume that there are no corruption events for listed firms if corruption activities are not revealed. If this were not true, our estimation based on a pooled sample would be biased. To reduce the concern regarding sample selection, we also use the matched sample as the second sample. We obtain the matched sample based on all firms without a corruption event revealed during the past 5 years. We match each firm having corrupt managers with a

control firm that is of similar size within the same three-digit industry. When *PERK* is the dependent variable, OLS regressions are estimated on the pooled sample.

For H1, we focus on the variable *IC*, which measures the internal control quality for each firm. The internal control quality is measured by the internal control index (IC) obtained from Shenzhen Dibo Internal Control Database, which has been widely used in studies on China. Shenzhen Dibo Internal Control Index is constructed from five perspectives of internal control: internal control strategies, operation efficiency, reporting quality, legal compliance, and asset safety. To make the index more scientific and reasonable, Dibo internal control index is also corrected using internal control deficiencies. The index ranges from 1 to 10, and a higher value of the index means a higher quality of internal control system. If a firm's internal control quality leads to less corruption activities by managers, the coefficient on *IC* ($\beta 1$) should be significantly negative.

We estimated the following regression (Model 2) to test the hypothesis that managerial power weakens the effectiveness of internal control quality regarding corruption activities by managers. The models are specified as follows.

$$\begin{aligned} Corruption = {} & \alpha + \beta_1 IC_{i,t} + \beta_2 Power_{i,t} + \beta_3 IC * Power + \beta_4 Size_{i,t} + \beta_5 ROA_{i,t} \\ & + \beta_6 Lev_{i,t} + \beta_7 Largest_{i,t} + \beta_8 Big4 + \beta_9 Central \\ & + \beta_{10} Marketization_{i,t} + \beta_{11} Compensation_{i,t} + \beta_{12} \sum Industry \\ & + \beta_{13} \sum Year + \varepsilon_{i,t} \end{aligned} \tag{2}$$

According to Hypothesis 2, we focus on variable *Power* and its interaction with *IC*. In accordance with prior studies on managerial power (e.g., Grinstein and Hribar, 2004; Fan et al., 2013), we construct the Power variable. We use principle component analysis to compute a composite measure (*Power*) of

these five variables, which are *Dual*, *Prestige*, *Tenure*, *Board*, and *Block shareholders*. A higher value of Power means more managerial power. If more managerial power leads to a less effective internal control system, the coefficient on the interaction term ($\beta 4$) should be significantly positive. For a robustness check, we also use the individual factor variable in *Power* construction (*Dual*, *Prestige*, *Tenure*, *Board*, and *Block shareholders*) to re-estimate the model (2).

The control variables in Model (1) and Model (2) can be categorized into one of two groups: (1) determinants of internal control; (2) determinants of corruption activities. Those control variables are defined as follows.（1）*Size* is measured as the log of total assets at the end of the fiscal year. The relation between firm size and corruption is unclear**.** On the one hand, because larger firms are affiliated with more associated companies, the business becomes more complex and riskier, causing a high possibility of fraud and corruption. On the other hand, large companies are closely watched by the media and the public, which can reduce managers' ability to abuse power and engage in corruption (Dyck et al., 2008). (2) *ROA* is the ratio of net income to total assets. Myers and Rajan (1998) noted that liquid assets are the lowest cost for managers to obtain private benefits. Profitable companies with higher cash flow would increase the opportunism motivation of the manager (Jensen and Meckling, 1976), leading to more corruption activities. (3) *Lev* indicates the level of debt overhang. In China's financial system, banks as the main debt holders have incentives to monitor the managers, particularly after bank reform, through listing in domestic stock markets as well as foreign stock markets. (4) *Largest, Big4,* and *Marketization* capture the internal and external corporate governance mechanism, respectively. According to corporate governance literature, good corporate governance would reduce the possibility of corruption by managers in SOEs. (5) *Compensation* indicates the compensation regulation of managers in SOEs, which is a special case around the world. Based on China state-owned listed companies, Chen et al. (2005)

find that the system of regulating emoluments has been positively related to the probability of executives engaging in corruption. (6) *Central* indicates whether the ultimate owner of a listed firm is central government or local government. We control *Central* dummy variable because there are differences in many aspects between central SOEs and local SOEs. Industry dummies are constructed using the industry classifications provided by China Security Regulation Committees (CSRC). A summary of the variable definitions is included in Appendix A.

3.3 Sample selection and descriptive analysis

In this study, we focus on SOEs because we are interested in the public corruption issue and only managers of SOEs have the power over the public assets. We trace the listed companies' ultimate owner from the annual reports and identify the firm as a SOE if its ultimate owner is local government or central government. In addition to hand-collected data, we obtain financial data, stock return data, and corporate governance data from CSMAR, and we obtain internal control data from Shenzhen Dibo Internal Control Database[11]. For regression tests, we construct two samples: a pooled sample and a matched sample. Table 1 reports the sample distribution. The pooled sample contains all the listed firms over the period 2007 to 2012. The pooled sample contains 5130 observations, among which we identify 206 firms with revealed corruption events. The matched sample contains the firms with corruption events and the one-to-one control sample firms with a similar size and in the same industry. The matched sample contains 412 observations, as indicated in Panel A of Table 1. There is no obvious evidence from Panel A and Panel B that the corruption events are clustered in a particular year or a particular industry.

[11] Below is the Dibo database website: http://irmd.dibcn.com:8082/irmd/common/login.jsp

Insert Table 2

Table 2 reports the descriptive analysis for main variables used in the following regressions. Over the period 2007 to 2012, there are 4.02% firms with revealed corruption events. Compared to the revealed corruption, job consumption presents more severe problems in Chinese SOEs. Regarding job consumption, the mean (median) of the eight consumption-related expenses is 13.7‰ (7.4‰) of the total sales for listed firms. Additionally, the mean (median) of the five perk-related expenses is 8.6‰ (5‰) of the total sales for listed firms. There is a large variation of average internal control indexes across listed companies, with the highest score (9.954) and the lowest score (0).

Insert Table 3

Table 3 reports the Pearson correlation. The correlation between the revealed corruption indicator and the hidden corruption variable (*Perk*) is low, which suggests that these two measures of corruption activities are complementary and capture the possibility of corruption activities from different angles. The internal control indicator (*IC*) is significantly related to *Revealed_corrupt* and *Perk*. In addition, the internal control indicator is significantly positively correlated with *Power*, *Size*, *ROA*, *Largest,* and *Compensation* and significantly negatively correlated with *Lev* and *Marketization*, which is consistent with Doyle et al (2007b). As expected, the corruption measures are also significantly correlated with most of the control variables.

4. Empirical results

4.1 Internal control quality and corruption activities (H1)

Insert Table 4

We use Model (1) to test hypothesis 1, which predicts that better internal

control quality would reduce the occurrence of corruption activities. Table 4 reports the regression estimation of Model (1) based on a pooled sample and a matched sample. Coefficient estimates for the industry and year fixed-effect variables are suppressed for brevity. All variables used in the regressions are winsorized at the top and bottom 0.5% to eliminate outliers' influence. In column (1) and (2), the dependent variable is *Revealed_corrupt*. In column (1), the estimation of Model (1) is based on a pooled sample, and the coefficient on *IC* is -0.258 with a significance level at 1%. In Column (2), the regression estimation is based on a matched sample, and the coefficient on *IC* is -0.614 with a significance level at 1%. Furthermore, the dependent variable we are also interested in is *Perk*, for which estimation results are shown in Column (3) and (4) of Table 4. Consistent with our prediction, the coefficient on *IC* is significantly negative.

Regarding other control variables, it is interesting to find that certain control variables have different impacts on *Revealed_corrupt* and *Perk*. For example, the coefficient on *Lev* is significantly positive, which indicates that firms with high solvency or liquidity risk are associated with a high possibility of corruption activities revealed. Conversely, the coefficient on *Lev* is negative but not significant, which means that top executives of firms with high leverage would spend less on job consumption. In addition, the coefficient on *Largest* is significantly and negatively related to corruption activities, which indicate that corruption is not typical agency problem as discussed in prior corporate governance literature. The negative coefficients on *Largest* suggest that concentrated ownership reduce the corruption activities since largest shareholder has strong incentive and ability to constrain the corruption activities. The coefficient on *Power* is significantly positive, suggesting that more powerful CEO is associated with high possibility of corruption.

4.2 Internal control quality, managerial power, and corruption activities (H2)

Insert Table 5

To gain preliminary insights into how the internal control quality is related to managerial power, we divide the sample into two groups (High and Low) according to the median value of the managerial power variables, and we study the difference in the internal control quality between the groups. The group comparison results are indicated in Table 5. We find that the internal control quality is higher for the High managerial power group than for the Low managerial power group. This data pattern contradicts our intuition that CEOs with high managerial power do not complement high-quality corporate governance mechanisms. However, this comparison of results may indicate that managerial power could make a "good" internal control system useless.

Insert Table 6

The regression results on the association between internal control quality, managerial power, and corruption activities are shown in Table 6. The regression estimations of Model (2) are based on a pooled sample and a matched sample. Coefficient estimates for the industry and year fixed-effect variables are suppressed for brevity. All variables used in the regressions are winsorized at the top and bottom 0.5% to eliminate outliers' influence. We use both the composite index of managerial power (Panel A of Table 6) and the individual factor of managerial power (Panel B and Panel C of Table 6). As predicted by Hypothesis 2, the coefficient on the interaction of internal control indicator (*IC*) and managerial power variable (*Power*) will be significantly positive.

Panel A of table 6 reports the regression estimations using the aggregate measure of managerial power as independent variables. In column (1) and (2), the dependent variable is *Revealed_corrupt*. In column (1), the estimation of

Model (2) is based on a pooled sample, and the coefficient of interaction of *IC* and *Power* is 0.142 with a significance level of 1%. In Column (2), the regression estimation of Model (2) is based on a matched sample, and the coefficient on the interaction term is 0.369 with a significance level of 5%. Furthermore, when the dependent variable is *Perk*, The interaction coefficient on *IC* and *Power* is 0.098(0.041) with a significant level of 5% in Column 3 (Column 4).

Panel B of Table 6 presents the regression results of *Revealed_Corrupt* on the individual managerial power factor variable. Panel C of Table 6 reports the regression results of *Perk* on the individual managerial power factor variable. In most cases, the interaction coefficients on the internal quality index (*IC*) and the managerial power variable (*Dual*, *Prestige*, *Tenure*, *Director*, and *Block shareholders*) are significantly positive. In summary, the empirical evidence supports our argument that managerial power is essential to the effective role of internal control on managerial misconduct.

4.3 Empirical findings in High and Low investor protection regions

Prior research on internal control and fraud are based on the samples located in the better investor protection areas, whereas studies rarely focus on firms located in weak investor protection areas. China's highly decentralized political and economic systems provide large variation in the institutional environments across its provinces and special districts, whereas China's language, culture, and social norms remain unified (Fan et al., 2007). Hence, it is interesting to study whether the reported results in Table 4 and Table 6 differ for Chinese SOEs located in provinces with strong investor protections versus Chinese SOEs located in provinces with weak investor protection. Consistent with existing research, we use Fan et al.'s (2010) provincial institutional development index (*Marketization*) as a proxy for the degree of provincial-level investor protection. We retrieve the registration address from Wind database for each firm to identify the region location and then classify

samples into a high marketization group and a low marketization group.

Insert Table 7

Table 7 reports the regression results of Model 1 and Model 2 for two groups with different investor protection levels. We find that, in Panel A, the internal control quality indicator (*IC*) is significantly related to *Revealed_corrupt* and *Perk* for both the high marketization group and the low marketization group. In addition, we find results for the interaction term of *IC* and *Power* similar to the results in Table 6 for both the high marketization group and the low marketization group. Chi tests show that coefficients on *IC* and *IC*Power* is no significant difference between high marketization group and low marketization group. These sensitivity tests indicate that better internal control can play an important positive role in a weak investor protection environment.

4.4 Robustness tests

4.4.1 Change of internal control quality and corruption

A cross sectional test between internal control quality and manager corruption activities might suffer from the omitted variable problem. To mitigate the omitted correlated variable concern, we conduct a change analysis to provide further evidence on the link between internal control effectiveness and corruption. Specifically, we examine whether the changes in internal control quality are associated with the changes in perk consumption in a way consistent with the levels regression results documented earlier.

$$\begin{aligned}\Delta PERK = {} & \alpha + \beta_1 \Delta IC + \beta_2 \Delta IC * Power + \beta_3 Power + \beta_4 Size_{i,t} + \beta_5 ROA_{i,t} \\ & + \beta_6 Lev_{i,t} + \beta_7 Largest_{i,t} + \beta_8 Big4 + \beta_9 Central \\ & + \beta_{10} Marketization_{i,t} + \beta_{11} Compensation_{i,t} + \beta_{12} \sum Industry \\ & + \beta_{13} \sum Year + \varepsilon_{i,t}\end{aligned}$$

(3)

We only focus on *PERK* because *Revealed_Corruption* is not continuous variable. *⊿IC* is the internal control quality score difference between prior year and current year. *⊿PERK* is measured as the *PERK* at the end of year minus the *PERK* at the beginning of year. All other variables are defined in Appendix A.

Insert Table 8

Table 8 reports the regression results of internal control effectiveness on corruption using a change model. Consistent with main results in Table 4, coefficients on *⊿IC* are significantly negative in four columns, indicating that improved internal control effectiveness could reduce the possibility of corruption conducted by SOEs managers. In addition, coefficients on the interaction of *⊿IC* and Power are positive but insignificant.

The advantage of a change analysis is that it uses the same firm as its own control and thus mitigates the omitted correlated variable concern by controlling for time-invariant firm characteristics (Cheng et al., 2014). To provide the further evidence, we also estimate the model using a firm fixed effect controlling for unobserved heterogeneity when this heterogeneity is constant over time and correlated with independent variables. The estimation results are presented in Table 9.

Insert Table 9

As showed in Table 9, the coefficients on *IC* are significantly positive and similar to the results in Table 4. These evidences suggest that internal control effectiveness play an important role to constrain corruption at firm level.

4.4.2 Abnormal perk

There is mixed evidence for the view that perks are managers' private benefits in the managerial perk literature based on U.S. firms (Rajan and Wulf, 2006; Yermark, 2006). However, Cai et al. (2010) find evidences that significant parts of perk consumption are managers' private consumption and

bribery to government official using Chinese firms. A possible explanation for these different results is that firms in China and the U.S. have different corporate governance characteristics and operate in the different institution environment.

It is widely believed that perk consumption likely contain both legitimate business expenses and illegitimate ones (Cai et al., 2010; Luo et al., 2011). To reduce the measurement noise of PERK, we use the following model to estimate normal level of managerial perk for each industry within each year. ~~as~~As suggested by Luo et al. (2011), we control firm-level characteristics including sales, tangible assets, inventory, and the number of employees.

$$\frac{Perk_{i,t}}{Asset_{i,t-1}} + \alpha_0 + \beta_1 \frac{1}{Asset_{i,t-1}} + \beta_2 \frac{\Delta Sale_{i,t}}{Asset_{i,t-1}} + \beta_3 \frac{PPE_{i,t}}{Asset_{i,t-1}} + \beta_4 \frac{Inventory_{i,t}}{Asset_{i,t-1}} + \beta_5 LnEmployee_{i,t} + \varepsilon_{i,t} \quad (4)$$

Insert Table 10

Table 10 reports the regression results of internal control effectiveness on corruption measured as abnormal perk. Abnormal perk is defined as the residual value from equation (4). Column (1) of Table 10 shows that internal control quality is significantly and negatively related to abnormal perk, consistent with the main results presented in Table 4. In Column (2) of Table 10, coefficient on the interaction between *IC* and *Power* is positive with significant level of 5%, consistent with the main result reported in Table 6. In Column (3) to (7) of Table 10, we use individual managerial power measure to retest the model and we find the similar results as predicted. To further verify the abnormal perk measure, we also use the simple model to estimate the abnormal perk. In the simple model, abnormal perk is calculated as the difference between a firm's perk and industry mean of managerial perk

within each year. We got the similar results (not tabulate here).

Insert Table 11

To reduce the potential effect of firm size, we construct new measures of *PERK* as the aggregate amount of eight (five) expenses in the cash flow statement divided by the number of employees. We rerun our Model (1) and Model (2) using the new measure of *PERK,* and the results (reported in Table 11) remain similar.

4.4.3 Heckman selection tests

In our main tests, we use sample firms that voluntarily disclose perk-related expenses during the period of 2007 to 2012. Using a simple OLS regression method may not provide consistent coefficient estimates of model (1) for such a selection-biased sample. Therefore, we use a two-stage Heckman selection model to correct for this self-selection bias as a robustness check. In accordance with prior literature on disclosure (Lang and Lundholm, 1993；Verrecchia，2001；Xiao et al.,2004), we use the following disclosure determinant model in the first stage.

$$Disclose_{it} = \alpha_0 + \alpha_1 Size_{i,t} + \alpha_2 Lev_{i,t} + \alpha_3 ROA_{i,t} + \alpha_4 Growth_{i,t} + \alpha_5 Central_{i,t} + \alpha_6 EM_{i,t} + \alpha_7 Big4_{i,t} + \alpha_8 Audit_{i,t-1} + \sum Year + \sum Industry + \varepsilon \quad (5)$$

Where, *Disclose* is a dummy variable, which equals 1 if firms do disclose perk-related expenses in their annual reports, and zero otherwise. The determinant factors for the disclosure of perk-related expenses we included in our model are firm size（*Size*）, financial leverage（*Lev*）, profitability（*ROA*）, sales growth（*Growth*）, type of ultimate owner （central state vs. local state）, earnings quality（*EM*）, auditor quality（*Big4*）, and auditor opinion（*Audit*）. Those determinant variables affect the tradeoff between the benefit and the

cost of disclosing certain information to external investors.

Insert Table 12

Table 12 presents the empirical results using a two-stage Heckman selection estimation of Model (1) and Model (2) when the dependent variables are *PERK*. As shown in the first stage, those firms with smaller size, low leverage, central state control, and non-Big 4 auditors tend to disclose more information regarding perk-related expenses. In the second stage, the coefficients on the Miller's ratio are significantly positive, which indicate a self-selection bias in our sample. We obtain similar results using a two-stage Heckman selection estimation.

5. Conclusion

The objective of this study is to examine whether internal control systems could improve operational efficiency by reducing managers' corruption activities. We also examine the association between internal control quality, managerial power, and corruption activities. We test our research questions using all state-controlled Chinese firms over the period 2007-2012. We find that firms with strong internal controls are negatively related with the revealed corruption activities of managers. We also find better internal controls play a more pronounced role in reducing corruption activities in SOEs when managerial power is weak. In addition, the relation between internal control quality and corruption activities does not depend on the institutional environment in which the firms are located. Overall, our results suggest that state-controlled Chinese firms' internal control systems play a

positive role in improving state-controlled Chinese firms' operational efficiency.

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Appendix A: Variable Definition

Dependent Variable	
Revealed Corruption (Revealed_corrupt)	Dummy variable, equal to 1 if there is corruption activities occurred in that year, otherwise zero.
Hidden Corruption (Perk)	We use two measures of perk in our paper. PERK1 is calculated as the aggregate amount of eight expenses divided by total sales. The eight expenses contains office expense, business travel expense, business entertainment expense, communication expense, training abroad expense, board meeting expense, company car and chauffer services, and meeting expense. PERK2 is the calculated as the aggregate amount of five expenses (i.e., business travel expense, business entertainment expense, communication expense, training abroad expense, and company car and chauffer services) divided by total sales. In the sensitivity test, we use PERK 3 and PERK4 for robust check. PERK 3 is calculated as the aggregate amount of eight expenses divided by number of employees. PERK4 is calculated as the aggregate amount of five expenses divided by number of employees.
Independent Variables	
Internal Control and Management Power	
Internal Control Quality (IC)	Shenzhen Dibo Internal control index
Dual	Category variables, equals to 2 if he/she is both Chairman and CEO, equals to 1 if he/she is both deputy chairman and CEO, otherwise zero.
Prestige	Dummy variable, equals to 1 if CEO also holds position outside the listed firms, otherwise zero.
Tenure	The number of years the manager has been a CEO of listed firm.
Board	Log of the number of board directors.
Block shareholders (Block)	Measured as the ratio of largest shareholder ownership to the aggregate ownership by the second- through tenth-largest shareholders.
Manager Power (Power)	Principle analysis based on five variables: Dual, Prestige, Tenure, Board, and Block shareholders
Control Variable	
Size	Measured as the natural logarithm of total assets
ROA	Measured as net income divided by average total assets.
Leverage (Lev)	Measured as total liabilities over total assets
Largest shareholder percentage (Largest)	Calculated as the number of largest shareholder's shares divided by outstanding shares.
Auditor (Big4)	Dummy variable, equals to 1 if a firm's auditor is one of big four international auditing firms, otherwise zero.
Central SOEs (Central)	Dummy variable, equals to 1 if ultimate owner is central state government, equals to 0 if ultimate owner is local state government.
Marketization	a comprehensive index capturing the following aspects of provincial market development: (1) relationship between

	government and market, including the role of market in allocating resources and firms' policy burden in addition to taxes; (2) development of non-state business in terms of the ratio of industrial output by private sector to total industrial output; (3) development of product markets in terms of the degree of regional trade barriers; (4) development of factor markets captured by foreign direct investment and labor mobility; and (5) development of market intermediaries and legal environment. Data source: Fan, Wang, and Zhu(2010)
Compensation	Measured as the average pay of the top three highest paid executives divided by the average pay of employees.

Appendix B: Corruption type and distribution

Type	Observation
Asset-related corruption	118
Contract-related corruption	39
Bribery and embezzlement	78
Total	235

Note: Total observations of corruption above are more than our sample (206 observations) because one manager could conduct multiple corruption activities.

Table 1: Distribution of sample firms (pooled sample and matched sample)

This table presents the sample distribution over the year (Panel A) and over the industry (Panel B). The pooled sample contains all the listed firms over the period 2007 to 2012. The matched sample contains the firms with corruption events and one-to-one control sample firms with a similar size and in the same industry. The pooled sample contains 5130 observations, whereas the matched sample contains 412 observations.

Panel A: Sample distribution across year

	2007	2008	2009	2010	2011	2012	Total
Pooled Sample:	804	848	869	885	840	884	5130
Matched sample:	70	76	86	68	60	52	412
Revealed_Corrupt event	35	38	43	34	30	26	206
Control sample:	35	38	43	34	30	26	206

Panel B: Sample distribution across industry

	Industry	Pooled	Revealed_Corrupt	Control sample
A	Agriculture, Livestock, Fishing	67	5	5
B	Mining and Quarrying	220	22	22
C0	Food and Drink	226	5	5
C1	Textile and Garment	93	3	3
C2	Timber and Furniture	6	0	0
C3	Paper and Printing	72	0	0
C4	Petroleum,Chemical products	571	25	25
C5	Electronics	180	4	4
C6	Ferrous Metal and non-Ferrous	461	40	40
C7	Machinery Manufacturing	775	17	17
C8	Medicine and Biological Products	250	10	10
C9	Other Manufacturing	9	0	0
D	Utilities	359	15	15
E	Construction	142	6	6
F	Transportation and Warehouse	361	36	36
G	Communication	216	0	0
H	Wholesalers and Retailers	445	7	7
J	Real Estate	370	7	7
K	Social Services	170	0	0
L	Media and Culture	63	2	2
M	Conglomerates	74	2	2
	Total	5130	206	206

Table 2: Descriptive analysis for main variables

This table reports the descriptive statistics of the main variables for the pooled sample. The pooled sample contains all the listed firms over the period 2007 to 2012. The detailed definitions of variables are listed in Appendix A.

Variable	N	Mean	SE.	Min.	25%	Median	75%	Max.
Revealed_corrupt	5130	0.0402	0.2571	0	0	0	0	1
Perk1	2709	0.0137	0.0215	0.0005	0.0037	0.0074	0.0152	0.2154
Perk2	2709	0.0086	0.0123	3.04e-10	0.0024	0.0050	0.0096	0.1116
IC	5130	6.8762	1.1314	0	6.5293	6.9197	7.2906	9.9536
Power	5130	0.0097	1.1119	-2.4273	-0.8130	-1.1334	0.7052	4.5947
Size	5130	22.1373	1.3283	18.5375	21.2129	21.9373	22.9207	26.4566
ROA	5130	0.0367	0.0641	-0.3125	0.0118	0.0338	0.0624	0.2658
Lev	5130	0.5358	0.2177	0.0454	0.3884	0.5442	0.6738	2.2712
Largest	5130	0.3910	0.1543	0.088	0.2656	0.3874	0.5051	0.7584
Big4	5130	0.0917	0.2886	0	0	0	0	1
Central	5130	0.3214	0.4671	0	0	0	1	1
Marketization	5130	8.7361	2.0102	0.38	7.56	8.93	10.42	11.8
Compensation	5130	7.5879	9.6483	-17.1679	3.1999	5.1520	8.8670	278.0385

Table 3: Correlation matrix for main variables (pooled sample)

This table presents the correlation among main variables used in the following regression tests. The pooled sample contains all the listed firms over the period 2007 to 2012. The lower triangular of this table shows the Pearson correlation coefficients and p values. Appendix A provides more detailed descriptions of variable definitions.

	Perk1	*Perk2*	*Revealed_Corruppt*	*IC*	*Power*	*Size*	*ROA*	*Lev*	*Largest*	*Big4*	*Central*	*Marketization*	*Compensation*
Perk2	0.873***	1											
	(0.000)												
Revealed_Corrupt	-0.013	-0.031**	1										
	(0.290)	(0.016)											
IC	-0.233***	-0.231***	-0.012	1									
	(0.000)	(0.000)	(0.246)										
Power	0.027*	0.019	0.041***	0.146***	1								
	(0.070)	(0.301)	(0.003)	(0.000)									
Size	-0.185***	-0.240***	0.074***	0.517***	0.159****	1							
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)								
ROA	-0.018	-0.048**	-0.030***	0.511***	0.106***	0.162***	1						
	(0.228)	(0.010)	(0.001)	(0.000)	(0.000)	(0.000)							
Lev	-0.089***	-0.102***	0.047***	-0.153***	0.009	0.200***	-0.419***	1					
	(0.000)	(0.000)	(0.000)	(0.000)	(0.539)	(0.000)	(0.000)						
Largest	-0.093***	-0.125***	0.038***	0.183***	-0.228***	0.293***	0.141***	-0.044**	1				
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)					
Big4	-0.052***	-0.048**	0.020	0.261***	0.072***	0.442***	0.070***	0.007	0.153***	1			
	(0.005)	(0.013)	(0.160)	(0.000)	(0.000)	(0.000)	(0.000)	(0.632)	(0.000)				
Central	0.0174	0.047**	-0.010	0.061***	-0.034**	0.090***	0.004	-0.018	0.043***	0.113***	1		
	(0.352)	(0.016)	(0.495)	(0.000)	(0.017)	(0.000)	(0.804)	(0.193)	(0.002)	(0.000)			
Marketization	-0.049***	0.014	-0.026***	-0.128***	0.001	0.078***	0.051***	-0.040***	0.040***	0.154***	0.035**	1	
	(0.001)	(0.444)	(0.005)	(0.000)	(0.943)	(0.000)	(0.000)	(0.004)	(0.004)	(0.000)	(0.013)		
Compensation	-0.038**	-0.041**	-0.008	0.157***	0.147***	0.164***	0.116***	0.037***	-0.139***	0.109***	-0.006	0.064***	1
	(0.011)	(0.028)	(0.411)	(0.000)	(0.000)	(0.000)	(0.000)	(0.007)	(0.000)	(0.000)	(0.687)	(0.000)	

Table 4: Regression analysis: influence of internal control on corruption

This table reports the coefficient estimates from the following equation:

$$Corruption = \alpha + \beta_1 IC_{i,t} + \beta_2 Power_{i,t} + \beta_3 Size_{i,t} + \beta_4 ROA_{i,t} + \beta_5 Lev_{i,t} + \beta_6 Largest_{i,t} + \beta_7 Big4 + \beta_8 Central + \beta_9 Marketization_{i,t} + \beta_{10} Compensation_{i,t} + \beta_{11} \sum Industry + \beta_{12} \sum Year + \varepsilon_{i,t}$$

The dependent variables are *Revealed_Corrupt*, *Perk1*, and *Perk2*. The pooled sample contains all the listed firms over the period 2007 to 2012. The matched sample contains the firms with corruption events and one-to-one control sample firms with a similar size and in the same industry. Appendix A provides more detailed descriptions of variable definitions. * denotes significance at the 10% level, ** at the 5% level, and *** at the 1% level.

Variables	（1）Pooled	（2）Matched sample	（3）	(4)
	Revealed_Corrupt	*Revealed_Corrupt*	*Perk1*	*Perk2*
Constant	-5.295***	2.064	8.084***	5.501***
	(-3.023)	(0.613)	(9.097)	(9.652)
IC	**-0.258*** **	**-0.614*** **	-0.179**	-0.085*
	(-2.824)	**(-3.508)**	(-2.096)	(-1.911)
Power	0.277***	1.464***	0.063*	0.041**
	(3.526)	(7.845)	(1.887)	(1.984)
Size	0.161*	-0.041	-0.226***	-0.156***
	(1.764)	(-0.268)	(-4.362)	(-4.997)
ROA	2.386	9.613***	-1.829*	-0.531
	(1.510)	(3.042)	(-1.658)	(-0.976)
Lev	1.405***	6.485***	-0.204	-0.186
	(3.697)	(5.535)	(-0.717)	(-0.942)
Largest	-0.050	-2.374**	-0.670***	-0.529***
	(-0.083)	(-2.061)	(-2.639)	(-3.688)
Big4	0.060	-0.182	0.288	0.222*
	(0.239)	(-0.362)	(1.374)	(1.847)
Central	0.060	0.493	0.122	0.134**
	(0.375)	(1.442)	(1.359)	(2.401)
Marketization	0.048	-0.022	-0.002	-0.001
	(-1.345)	(-0.254)	(-0.079)	(-0.073)
Compensation	-0.034**	-0.037	0.000	-0.004*
	(-2.371)	(-1.525)	(0.050)	(-1.656)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	5130	412	2709	2709
Pseudo/Adj. R^2	0.089	0.333	0.134	0.150

Table 5: Internal control quality comparison: High managerial power vs. Low managerial power

This table reports the internal control quality comparison between the high managerial power group and the low managerial power group. Group is the dummy variable, equal to 1 if a firm has a CEO with higher power, otherwise zero. Appendix A provides more detailed descriptions of variable definitions. * denotes significance at the 10% level, ** at the 5% level, and *** at the 1% level.

Variable	Group	N	Mean	25%	Median	75%	Mean Diff.	Median Diff.
Power	0	2565	6.751	6.454	6.871	7.210		
	1	2565	7.035	6.663	6.993	7.423	-0.284***	-0.122***
							（-9.105）	（-9.254）
Dual	0	4012	6.868	6.537	6.915	7.276		
	1	1118	6.990	6.623	6.961	7.403	-0.122***	-0.046***
							（-3.179）	（-3.220）
Prestige	0	2768	6.786	6.471	6.881	7.220		
	1	2362	7.022	6.665	6.993	7.418	-0.236***	-0.112***
							（-7.553）	（-8.078）
Board	0	3524	6.789	6.501	6.887	7.215		
	1	1606	7.129	6.673	7.046	7.613	-0.340***	-0.159***
							（-10.116）	（-10.109）
Tenure	0	2700	6.794	6.455	6.886	7.224		
	1	2430	7.006	6.661	6.979	7.405	-0.212***	-0.093***
							（-6.774）	（-7.307）
Block Shareholders	0	2556	6.893	6.560	6.920	7.292		
	1	2574	6.895	6.539	6.930	7.307	-0.002	-0.010
							（-0.060）	（-0.762）

Table 6: The relation between internal control and corruption: dependent on managerial power

This table reports the coefficient estimates from the following equation:

$$Corruption = \alpha + \beta_1 IC_{i,t} + \beta_2 Power_{i,t} + \beta_3 IC * Power + \beta_4 Size_{i,t} + \beta_5 ROA_{i,t} + \beta_6 Lev_{i,t} + \beta_7 Largest_{i,t} + \beta_8 Big4 + \beta_9 Central + \beta_{10} Marketization_{i,t} + \beta_{11} Compensation_{i,t} + \beta_{12} \sum Industry + \beta_{13} \sum Year + \varepsilon_{i,t}$$

The dependent variables are *Revealed_Corrupt*, *Perk1,* and *Perk2*. The pooled sample contains all the listed firms over the period 2007 to 2012. The matched sample contains the firms with corruption events and one-to-one control sample firms with similar size and in the same industry.

Panel A reports the regression results using a composite measure (Principle component analysis) of managerial power (*Power*). Panel B and Panel C report the regression results using an individual factor variable of managerial power (*Dual*, *Prestige*, *Tenure*, *Board*, and *Block shareholders*). In panel B, the dependent variable is *Revealed_corrupt*, and the dependent variable is *Perk* in Panel C. * denotes significance at the 10% level, ** at the 5% level, and *** at the 1% level. Refer to Appendix A for variable definitions.

Panel A: aggregate measure of managerial power

Variables	（1）Pooled	（2）Matched	（3）	（4）
	Revealed_Corrupt	*Revealed_Corrupt*	*Perk1*	*Perk2*
Constant	-6.801***	-1.835	6.831***	4.907***
	(-3.418)	(-0.509)	(6.077)	(6.960)
IC	**-0.265*** **	**-0.439** **	-0.179**	-0.087**
	(-3.118)	**(-2.093)**	(-2.137)	(-1.972)
IC*Power	**0.142*** **	**0.369** **	0.098**	0.041**
	(3.381)	**(2.320)**	(2.522)	(2.246)
Power	0.269***	1.327***	0.049	0.036*
	(3.369)	(6.827)	(1.450)	(1.721)
Size	0.144	-0.053	-0.226***	-0.156***
	(1.564)	(-0.337)	(-4.391)	(-5.031)
ROA	2.717*	10.225***	-1.757	-0.494
	(1.812)	(3.070)	(-1.604)	(-0.912)
Lev	1.446***	6.608***	-0.211	-0.188
	(3.902)	(5.575)	(-0.744)	(-0.956)
Largest	-0.009	-2.606**	-0.651**	-0.520***
	(-0.014)	(-2.222)	(-2.555)	(-3.617)
Big4	-0.015	-0.595	0.281	0.221*
	(-0.061)	(-1.074)	(1.341)	(1.837)
Central	0.086	0.559	0.130	0.138**
	(0.489)	(1.618)	(1.465)	(2.469)

Marketization	0.046	-0.017	-0.002	-0.001
	(1.284)	(-0.194)	(-0.078)	(-0.095)
Compensation	-0.040***	-0.039	-0.001	-0.004*
	(-2.599)	(-1.617)	(-0.313)	(-1.887)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	5130	412	2709	2709
Pseudo/Adj. R^2	0.096	0.345	0.137	0.151

Panel B: individual management power measure (Dependent variable=*Revealed_Corrupt*)

	Matched Sample					Pooled Sample				
	(1)	(2)	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*
Constant	-8.108***	-5.572**	-5.396**	-5.057**	-6.386***	-8.069***	-7.257***	-7.964***	-7.564***	-7.976***
	(-3.152)	(-2.181)	(-2.151)	(-1.984)	(-2.631)	(-4.475)	(-4.042)	(-4.433)	(-4.161)	(-4.427)
IC	-0.688***	-0.756***	-0.529***	-0.613***	-0.448***	-0.341***	-0.345***	-0.270***	-0.237***	-0.217**
	(-4.219)	(-3.958)	(-3.435)	(-3.704)	(-2.955)	(-3.912)	(-3.665)	(-3.218)	(-2.878)	(-2.513)
*IC*Dual*	**0.418**					**0.216****				
	(1.586)					**(2.504)**				
Dual	**1.512*****					**0.427*****				
	(4.991)					**(3.599)**				
*IC*Prestige*		**0.497****					**0.222***			
		(2.187)					**(1.814)**			
Prestige		**1.299*****					**0.425*****			
		(5.155)					**(2.578)**			
*IC*Tenure*			0.077					0.023		
			(1.384)					(0.870)		
Tenure			0.336***					0.106***		
			(4.907)					(2.756)		
*IC*Director*				**1.792*****					**0.668****	
				(2.845)					**(2.526)**	
Director				**1.889****					**0.004**	
				(2.496)					**(0.010)**	
*IC*Block_shareholder*					**-0.035****					**-0.029****
					(-2.103)					**(-2.278)**
Block_shareholder					**-0.022**					**-0.034***
					(-1.040)					**(-1.937)**
Size	0.246**	0.161	0.164	0.154	0.210*	0.203**	0.167**	0.207**	0.188**	0.198**
	(2.053)	(1.318)	(1.377)	(1.288)	(1.813)	(2.452)	(2.025)	(2.523)	(2.242)	(2.394)

ROA	8.016***	9.041***	7.531***	8.720***	7.799***	2.669*	2.642*	2.695*	2.777*	2.518*
	(3.090)	(3.559)	(3.041)	(3.422)	(3.207)	(1.798)	(1.779)	(1.797)	(1.885)	(1.656)
Lev	4.166***	3.890***	3.913***	3.788***	3.629***	1.447***	1.431***	1.445***	1.372***	1.393***
	(4.735)	(4.476)	(4.708)	(4.549)	(4.533)	(3.491)	(3.528)	(3.532)	(3.402)	(3.392)
Largest	-2.038**	-2.727***	-1.959**	-2.916***	-1.737*	-0.493	-0.693	-0.512	-0.654	0.071
	(-2.275)	(-3.056)	(-2.220)	(-3.275)	(-1.672)	(-0.829)	(-1.162)	(-0.867)	(-1.106)	(0.102)
Big4	-0.289	-0.357	-0.228	-0.298	-0.323	0.029	0.096	0.077	-0.008	0.000
	(-0.659)	(-0.798)	(-0.530)	(-0.705)	(-0.789)	(0.106)	(0.362)	(0.289)	(-0.030)	(0.001)
Central	0.696**	0.566**	0.704**	0.624**	0.615**	0.071	0.035	0.048	0.033	0.003
	(2.478)	(2.015)	(2.520)	(2.288)	(2.283)	(0.402)	(0.199)	(0.275)	(0.190)	(0.019)
Marketization	0.085	0.035	0.039	0.043	0.037	0.044	0.049	0.045	0.047	0.051
	(1.260)	(0.515)	(0.599)	(0.663)	(0.580)	(1.011)	(1.126)	(1.034)	(1.078)	(1.162)
Compensation	-0.027	-0.036*	-0.038*	-0.024	-0.021	-0.036**	-0.033**	-0.035**	-0.032**	-0.033**
	(-1.258)	(-1.736)	(-1.810)	(-1.152)	(-1.077)	(-2.373)	(-2.289)	(-2.429)	(-2.140)	(-2.245)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	412	412	412	412	412	5130	5130	5130	5130	5130
Pseudo R^2	0.210	0.183	0.175	0.152	0.127	0.092	0.086	0.085	0.084	0.085

Panel C: individual management power measure (Dependent Variable=*Perk*)

	Perk1					Perk2				
	(1)	(2)	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*
Constant	6.509***	7.015***	6.601***	6.463***	6.613***	4.724***	5.057***	4.778***	4.692***	4.779***
	(7.031)	(7.538)	(7.133)	(6.927)	(7.148)	(8.673)	(9.252)	(8.776)	(8.549)	(8.784)
IC	-0.229***	-0.244***	-0.190***	-0.186***	-0.161***	-0.107***	-0.156***	-0.082***	-0.089***	-0.084***
	(-4.315)	(-4.202)	(-3.805)	(-3.805)	(-3.205)	(-3.396)	(-4.541)	(-2.788)	(-3.081)	(-2.825)
*IC*Dual*	0.132**					0.055*				
	(2.482)					(1.769)				
Dual	0.080					0.038				
	(1.271)					(1.053)				

*IC*Prestige*		0.153**					0.167***			
		(2.074)					(3.813)			
Prestige		0.227***					0.125***			
		(2.923)					(2.745)			
*IC*Tenure*			0.021					-0.006		
			(1.231)					(-0.557)		
Tenure			-0.004					0.001		
			(-0.197)					(0.135)		
*IC*Director*				0.445***					0.179*	
				(2.603)					(1.765)	
Director				-0.249					-0.113	
				(-1.204)					(-0.929)	
*IC*Block_shareholder*					-0.011					-0.001
					(-0.1588)					(-0.247)
Block_shareholder					-0.001					-0.007*
					(-0.184)					(-1.708)
Size	-0.209***	-0.237***	-0.213***	-0.207***	-0.214***	-0.147***	-0.165***	-0.149***	-0.145***	-0.151***
	(-4.882)	(-5.470)	(-4.969)	(-4.766)	(-4.978)	(-5.798)	(-6.474)	(-5.902)	(-5.670)	(-5.968)
ROA	-1.575*	-1.815**	-1.691**	-1.619**	-1.682**	-0.390	-0.499	-0.444	-0.408	-0.540
	(-1.942)	(-2.246)	(-2.087)	(-2.003)	(-2.066)	(-0.821)	(-1.056)	(-0.935)	(-0.861)	(-1.131)
Lev	-0.196	-0.200	-0.213	-0.201	-0.189	-0.183	-0.181	-0.180	-0.180	-0.194
	(-0.854)	(-0.874)	(-0.926)	(-0.876)	(-0.822)	(-1.354)	(-1.344)	(-1.331)	(-1.336)	(-1.431)
Largest	-0.793***	-0.813***	-0.809***	-0.841***	-0.819**	-0.609***	-0.622***	-0.613***	-0.633***	-0.444**
	(-2.957)	(-3.037)	(-3.005)	(-3.130)	(-2.573)	(-3.840)	(-3.943)	(-3.859)	(-3.986)	(-2.366)
Big4	0.294*	0.293*	0.285*	0.273*	0.281*	0.225**	0.228**	0.223**	0.218**	0.209**
	(1.779)	(1.777)	(1.723)	(1.655)	(1.699)	(2.293)	(2.328)	(2.270)	(2.220)	(2.124)
Central	0.125	0.112	0.114	0.123	0.112	0.133***	0.124**	0.129**	0.132***	0.121**
	(1.461)	(1.318)	(1.336)	(1.450)	(1.309)	(2.622)	(2.469)	(2.555)	(2.622)	(2.396)
Marketization	-0.005	-0.003	-0.003	-0.003	-0.003	-0.003	-0.001	-0.002	-0.002	-0.001
	(-0.233)	(-0.134)	(-0.141)	(-0.137)	(-0.128)	(-0.236)	(-0.121)	(-0.127)	(-0.154)	(-0.095)
Compensation	0.001	0.001	0.001	0.001	0.001	-0.003	-0.004	-0.003	-0.004	-0.003
	(0.087)	(0.041)	(0.081)	(0.039)	(0.067)	(-1.215)	(-1.389)	(-1.145)	(-1.239)	(-1.215)

Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2709	2709	2709	2709	2709	2709	2709	2709	2709	2709
Adj R^2	0.135	0.137	0.134	0.136	0.134	0.150	0.155	0.149	0.150	0.149

Table 7: Influence of internal control quality on corruption activities: region development comparison

This table reports the regression coefficient of model 1 and model 2 based on a subsample of high and low marketization groups. Appendix A provides more detailed descriptions of variable definitions. * denotes significance at the 10% level, ** at the 5% level, and *** at the 1% level.

Panel A: estimation of following model for low vs. high marketization group

$$Corruption = \alpha + \beta_1 IC_{i,t} + \beta_2 Power_{i,t} + \beta_3 Size_{i,t} + \beta_4 ROA_{i,t} + \beta_5 Lev_{i,t} + \beta_6 Largest_{i,t} + \beta_7 Big4 + \beta_8 Central + \beta_9 Compensation_{i,t} + \beta_{10} \sum Industry + \beta_{11} \sum Year + \varepsilon_{i,t}$$

	Low marketization group				High marketization group			
	Pooled	Matched	Perk1	Perk2	Pooled	Matched	Perk1	Perk2
Constant	-28.441**	-20.445	7.013***	5.135***	-1.314	4.492	8.607***	5.610***
	(-7.761)	(-1.620)	(5.237)	(6.398)	(-0.675)	(1.570)	(7.850)	(8.741)
IC	**-0.360****	**-1.574***	**-0.211*****	**-0.107*****	**-0.285*****	**-0.541*****	**-0.219*****	**-0.103*****
	(-2.203)	**(-1.812)**	**(-3.471)**	**(-2.918)**	**(-2.654)**	**(-3.028)**	**(-3.379)**	**(-2.712)**
Power	0.119	3.758***	-0.115*	-0.085**	0.310***	1.111***	0.101**	0.070***
	(0.469)	(2.772)	(-1.960)	(-2.441)	(3.669)	(6.063)	(2.213)	(2.618)
Size	0.213	-0.656	-0.141**	-0.113***	0.122	-0.023	-0.228***	-0.155***
	(1.192)	(-0.798)	(-2.102)	(-2.806)	(1.194)	(-0.164)	(-4.115)	(-4.774)
ROA	8.591**	7.528	-2.406**	-2.226***	2.828	10.494***	-1.252	0.458
	(2.217)	(0.954)	(-2.288)	(-3.578)	(1.157)	(3.384)	(-1.148)	(0.713)
Lev	5.333***	15.887***	-0.279	-0.239	1.066**	5.590***	-0.159	-0.145
	(3.940)	(2.713)	(-0.878)	(-1.247)	(2.186)	(4.744)	(-0.526)	(-0.824)
Largest	-0.930	2.057	-1.171***	-0.681**	0.279	-0.135	-0.505	-0.435**
	(-0.595)	(0.447)	(-2.629)	(-2.582)	(0.417)	(-0.128)	(-1.450)	(-2.113)
Big4	0.026	-0.067	-0.760	-0.316	0.183	-0.281	0.334*	0.236**
	(0.032)	(-0.190)	(-1.523)	(-0.994)	(0.722)	(-0.532)	(1.808)	(2.164)
Central	-0.676	-3.803*	-0.094	-0.074	0.234	0.755**	0.228**	0.232***
	(-1.260)	(-1.759)	(-0.710)	(-0.929)	(1.164)	(2.237)	(2.101)	(3.637)
Marketization	1.139***	6.359***	-0.094	-0.090**	-0.203***	-0.349***	-0.014	0.010
	(5.133)	(3.157)	(-1.361)	(-2.130)	(-2.789)	(-3.049)	(-0.393)	(0.457)
Compensation	-0.131**	-0.489***	0.001	0.000	-0.030**	-0.027	-0.001	-0.005
	(-2.447)	(-2.730)	(0.130)	(0.022)	(-2.031)	(-1.141)	(-0.093)	(-1.488)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1125	107	784	784	4005	305	1925	1925
Pseudo/Adj R^2	0.233	0.692	0.261	0.300	0.117	0.268	0.102	0.111
IC diff Chi2 (p_value)	0.15 (0.702)		1.83 (0.177)		0.01 (0.971)		0.01 (0.974)	

Panel B: estimation of the following model for low vs. high marketization group:

$$Corruption = \alpha + \beta_1 IC_{i,t} + \beta_2 Power_{i,t} + \beta_3 IC * Power + \beta_4 Size_{i,t} + \beta_5 ROA_{i,t} + \beta_6 Lev_{i,t} + \beta_7 Largest_{i,t} + \beta_8 Big4 + \beta_9 Central + \beta_{10} Compensation_{i,t} + \beta_{11} \sum Industry + \beta_{12} \sum Year + \varepsilon_{i,t}$$

	Low marketization group				High marketization group			
	Pooled	Matched	Perk1	Perk2	Pooled	Matched	Perk1	Perk2
Constant	-32.407	-26.159	5.677***	4.465***	-3.030	0.710	7.008***	4.872***
	(-0.019)	(-1.516)	(4.001)	(5.249)	(-1.492)	(0.229)	(5.713)	(6.792)
IC	-0.295	-2.247**	-0.144**	-0.074*	-0.308***	**-0.427****	-0.239***	-0.111***
	(-1.542)	(-2.119)	(-2.238)	(-1.924)	(-3.200)	**(-2.076)**	(-3.672)	(-2.905)
*IC*Power*	**0.367****	-0.775	**0.151*****	**0.079*****	**0.143*****	**0.360****	**0.105*****	**0.037***
	(2.332)	(-1.249)	**(3.029)**	**(2.675)**	**(2.834)**	**(2.287)**	**(2.819)**	**(1.702)**
Power	0.097	4.560***	-0.102*	-0.077**	0.298***	0.991***	0.077*	0.062**
	(0.455)	(2.792)	(-1.733)	(-2.208)	(3.546)	(5.100)	(1.668)	(2.295)
Size	0.282	-1.122	-0.150**	-0.117***	0.102	-0.035	-0.225***	-0.154***
	(1.334)	(-1.179)	(-2.236)	(-2.923)	(1.106)	(-0.243)	(-4.072)	(-4.755)
ROA	8.671**	8.861	-2.712**	-2.357***	2.934	11.365***	-1.045	0.528
	(2.349)	(1.056)	(-2.580)	(-3.792)	(1.640)	(3.476)	(-0.957)	(0.821)
Lev	5.338***	18.699***	-0.249	-0.225	1.197**	5.782***	-0.183	-0.151
	(3.661)	(2.676)	(-0.786)	(-1.174)	(2.450)	(4.828)	(-0.607)	(-0.861)
Largest	-0.738	5.813	-1.102**	-0.643**	0.315	-0.531	-0.486	-0.425**
	(-0.467)	(1.014)	(-2.485)	(-2.445)	(0.463)	(-0.491)	(-1.397)	(-2.065)
Big4	0.024	-0.069	-0.593	-0.220	0.097	-0.348	0.324*	0.234**
	(0.033)	(-0.197)	(-1.188)	(-0.689)	(0.344)	(-0.666)	(1.758)	(2.148)
Central	-0.679	-4.670*	-0.092	-0.071	0.261	0.813**	0.225**	0.242***
	(-1.061)	(-1.859)	(-0.679)	(-0.954)	(1.345)	(2.260)	(2.234)	(3.577)
Marketization	1.184***	6.774***	-0.098	-0.094**	-0.200***	-0.319***	-0.019	0.005
	(3.694)	(3.090)	(-1.430)	(-2.205)	(-2.760)	(-2.727)	(-0.541)	(0.216)
Compensation	-0.169***	-0.544***	-0.001	-0.001	-0.034**	-0.030	-0.002	-0.006*
	(-2.940)	(-2.719)	(-0.124)	(-0.163)	(-2.095)	(-1.241)	(-0.381)	(-1.719)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1125	107	784	784	4005	305	1925	1925
Pseudo/Adj R^2	0.135	0.707	0.270	0.305	0.098	0.285	0.106	0.114
*IC*Power Diff* Chi2 (p-value)	2.08 (0.1496)		3.28* (0.070)		0.18 (0.6699)		0.51 (0.4734)	

Table 8: Influence of internal control effectiveness on corruption: a change analysis

This table reports the coefficient estimates from the following equation:

$$\Delta PERK = \alpha + \beta_1 \Delta IC + \beta_2 \Delta IC * Power + \beta_3 Power + \beta_4 Size_{i,t} + \beta_5 ROA_{i,t} + \beta_6 Lev_{i,t} + \beta_7 Largest_{i,t} + \beta_8 Big4 + \beta_9 Central + \beta_{10} Marketization_{i,t} + \beta_{11} Compensation_{i,t} + \beta_{12} \sum Industry + \beta_{13} \sum Year + \varepsilon_{i,t}$$

The dependent variables are *ΔPerk1 and ΔPerk2* . The pooled sample contains all the listed firms over the period 2007 to 2012. The matched sample contains the firms with corruption events and one-to-one control sample firms with a similar size and in the same industry. Appendix A provides more detailed descriptions of variable definitions. * denotes significance at the 10% level, ** at the 5% level, and *** at the 1% level.

	ΔPerk1	*ΔPerk2*	*ΔPerk1*	*ΔPerk2*
Constant	0.550	0.429	0.545	0.428
	(0.582)	(0.939)	(0.577)	(0.937)
ΔIC	**-0.139*** **	**-0.043***	**-0.139*** **	**-0.043***
	(-3.028)	**(-1.856)**	**(-3.033)**	**(-1.880)**
*ΔIC*Power*			**0.053**	**0.014**
			(1.368)	**(0.727)**
Power	0.032	0.004	0.042	0.006
	(0.808)	(0.184)	(1.041)	(0.313)
Size	-0.013	-0.006	-0.012	-0.006
	(-0.293)	(-0.286)	(-0.285)	(-0.284)
ROA	-3.741***	-1.332***	-3.691***	-1.319***
	(-4.454)	(-3.204)	(-4.390)	(-3.169)
Lev	-0.259	-0.134	-0.253	-0.132
	(-1.010)	(-1.060)	(-0.987)	(-1.048)
Largest	0.214	0.082	0.212	0.081
	(0.690)	(0.535)	(0.683)	(0.528)
Big4	-0.249	-0.152*	-0.250	-0.152*
	(-1.330)	(-1.656)	(-1.335)	(-1.662)
Central	0.001	0.038	-0.002	0.038
	(0.011)	(0.820)	(-0.023)	(0.801)
Marketization	0.031	0.009	0.031	0.009
	(1.338)	(0.764)	(1.313)	(0.744)
Compensation	0.003	0.001	0.003	0.001
	(0.637)	(0.442)	(0.648)	(0.449)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	2553	2553	2553	2553
Pseudo/Adj R^2	0.017	0.006	0.018	0.005

Table 9: Influence of internal control effectiveness on corruption: a firm fixed model

This table reports the regression coefficients of internal control quality and corruption using firm fixed effect model. The dependent variables are *Revealed_Corrupt*, *Perk1*, and *Perk2*. The pooled sample contains all the listed firms over the period 2007 to 2012. The matched sample contains the firms with corruption events and one-to-one control sample firms with a similar size and in the same industry. Appendix A provides more detailed descriptions of variable definitions. * denotes significance at the 10% level, ** at the 5% level, and *** at the 1% level.

Variables	（1）Pool	（2）	(3)
	Corrupt1	*Perk1*	*Perk2*
Constant		8.762***	6.176***
		(3.358)	(4.381)
IC	**-0.395*** **	**-0.205*** **	**-0.094*** **
	(-2.911)	**(-4.312)**	**(-3.604)**
Power	0.214	-0.010	-0.008
	(1.500)	(-0.211)	(-0.288)
Size	-0.182	-0.260**	-0.214***
	(-0.517)	(-2.097)	(-3.201)
ROA	-0.623	-1.820**	-0.650
	(-0.307)	(-2.093)	(-1.395)
Lev	0.452	0.773*	0.545**
	(0.513)	(1.818)	(2.341)
Largest	1.637	-1.591**	-0.649
	(0.665)	(-2.183)	(-1.633)
Big4	-0.323	-0.715**	-0.492***
	(-0.232)	(-2.277)	(-2.941)
Compensation	-0.015	0.003	-0.001
	(-0.711)	(0.468)	(-0.181)
LR chi2/F	47.72***	5.47***	5.26***

Table 10: Influence of internal control effectiveness on corruption: abnormal PERK measures

This table reports the regression coefficient of internal control effectiveness on control using abnormal perk as dependent variable. We use the blow model to estimate abnormal perk for each industry within each year.

$$\frac{Perk_{i,t}}{Asset_{i,t-1}} = \alpha_0 + \beta_1 \frac{1}{Asset_{i,t-1}} + \beta_2 \frac{\Delta Sale_{i,t}}{Asset_{i,t-1}} + \beta_3 \frac{PPE_{i,t}}{Asset_{i,t-1}} + \beta_4 \frac{Inventory_{i,t}}{Asset_{i,t-1}} + \beta_5 LnEmployee_{i,t} + \varepsilon_{i,t}$$

Appendix A provides more detailed descriptions of variable definitions. * denotes significance at the 10% level, ** at the 5% level, and *** at the 1% level.

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
Constant	-0.0013	-0.0050	-0.0070	-0.0055	-0.0066	-0.0059	-0.0068
	(-0.3193)	(-1.1329)	(-1.6072)	(-1.2622)	(-1.4969)	(-1.3431)	(-1.5442)
IC	**-0.0005***	**-0.0005***	**-0.0007****	**-0.0009*****	**-0.0005***	**-0.0005***	**-0.0004**
	(-1.9118)	**(-1.9275)**	**(-2.3798)**	**(-2.7050)**	**(-1.9553)**	**(-1.8989)**	**(-1.2820)**
*IC*Power*		**0.0004****					
		(2.2199)					
Power	0.0007***	**0.0006*****					
	(3.4543)	**(3.1734)**					
*IC*Dual*			**0.0005***				
			(1.8254)				
Dual			**0.0010*****				
			(2.9839)				
*IC*Prestige*				**0.0008****			
				(2.0030)			
Prestige				**0.0011*****			
				(2.5825)			
*IC*Tenure*					0.0000		
					(0.5152)		
Tenure					0.0001		
					(0.9547)		
*IC*Director*						0.0005	
						(0.5085)	
Director						0.0011	
						(0.9715)	
*IC*Block_shareholder*							**-0.0001****
							(-2.4480)
Block_shareholder							**-0.0000**
							(-0.6302)
Size	0.0000	0.0000	0.0001	0.0000	0.0001	0.0001	0.0001
	(0.0783)	(0.0961)	(0.6021)	(0.2116)	(0.5477)	(0.3465)	(0.5847)
ROA	0.0136***	0.0139***	0.0150***	0.0145***	0.0147***	0.0150***	0.0149***
	(3.0338)	(3.0951)	(3.3411)	(3.2273)	(3.2597)	(3.3367)	(3.2897)
Lev	0.0018	0.0018	0.0019	0.0018	0.0019	0.0019	0.0019
	(1.4302)	(1.4008)	(1.4665)	(1.4354)	(1.4458)	(1.4723)	(1.5152)
Largest	-0.0011	-0.0010	-0.0023	-0.0026*	-0.0024	-0.0025*	-0.0024
	(-0.7033)	(-0.6635)	(-1.5488)	(-1.7733)	(-1.6347)	(-1.6477)	(-1.3406)
Big4	-0.0013	-0.0013	-0.0012	-0.0012	-0.0012	-0.0012	-0.0013
	(-1.4006)	(-1.4360)	(-1.3386)	(-1.3812)	(-1.3382)	(-1.3263)	(-1.4377)
Central	0.0008*	0.0008*	0.0008*	0.0007	0.0008	0.0007	0.0007

	(1.7099)	(1.7783)	(1.7922)	(1.5047)	(1.5917)	(1.5599)	(1.4521)
Marketization	0.0002**	0.0002**	0.0002*	0.0002*	0.0002*	0.0002**	0.0002*
	(2.0039)	(2.0046)	(1.7430)	(1.9002)	(1.8927)	(1.9713)	(1.8788)
Compensation	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.4455)	(0.2586)	(0.5216)	(0.5440)	(0.5482)	(0.6117)	(0.5163)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2709	2709	2709	2709	2709	2709	2709
Adj R^2	0.113	0.115	0.113	0.112	0.110	0.110	0.111

Table 11: Sensitivity test: different proxies for PERK

This table presents the regression coefficient of model 1 and model 2 using alternative proxies for hidden corruption measure: *Perk3* and *Perk4*. The Appendix A provides more detailed descriptions of variable definitions. * denotes significance at the 10% level, ** at the 5% level, and *** at the 1% level.

	Perk3				*Perk4*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	0.926	0.538	1.445	-0.578	0.613	0.168	1.592*	-0.955
	(1.086)	(0.566)	(1.063)	(-0.520)	(1.120)	(0.275)	(1.901)	(-1.286)
IC	**-0.054**	**-0.058**	**0.072**	**-0.137****	**-0.062***	**-0.065****	**0.032**	**-0.135****
	(-1.073)	**(-1.147)**	**(0.913)**	**(-2.042)**	**(-1.926)**	**(-1.997)**	**(0.652)**	**(-3.026)**
*IC*Power*		**0.096*****				**0.057*****		
		(3.114)				**(2.896)**		
Power	0.100***	0.089**	0.258***	-0.025	0.035	0.028	0.117**	0.001
	(2.692)	(2.366)	(3.275)	(-0.256)	(1.452)	(1.151)	(2.426)	(0.022)
Size	-0.009	-0.010	-0.037	0.054	0.011	0.011	-0.035	0.084**
	(-0.204)	(-0.225)	(-0.543)	(0.925)	(0.397)	(0.379)	(-0.830)	(2.159)
ROA	3.604***	3.690***	4.909***	2.626**	2.692***	2.744***	3.794***	1.793**
	(4.341)	(4.450)	(3.755)	(2.445)	(5.051)	(5.152)	(4.732)	(2.502)
Lev	0.724***	0.719***	-0.147	1.219***	0.425***	0.421***	-0.084	0.687***
	(3.076)	(3.058)	(-0.375)	(4.153)	(2.809)	(2.793)	(-0.352)	(3.508)
Largest	-0.019	0.003	-1.108**	0.707*	-0.168	-0.156	-1.098***	0.482*
	(-0.065)	(0.010)	(-2.403)	(1.913)	(-0.913)	(-0.846)	(-3.882)	(1.956)
Big4	0.004	0.002	0.073	-0.245	0.018	0.017	0.090	-0.183
	(0.023)	(0.009)	(0.285)	(-1.044)	(0.164)	(0.152)	(0.573)	(-1.165)
Central	0.185**	0.194**	0.244*	0.187	0.173***	0.178***	0.236***	0.148*
	(2.101)	(2.209)	(1.788)	(1.633)	(3.054)	(3.155)	(2.815)	(1.937)
Marketization	0.092***	0.091***	0.093***	0.096***	0.061***	0.061***	0.060***	0.065***
	(4.220)	(4.196)	(2.677)	(3.431)	(4.380)	(4.359)	(2.845)	(3.520)
Compensation	-0.041***	-0.042***	-0.049***	-0.038**	-0.026***	-0.027***	-0.032***	-0.025***
	(-8.249)	(-8.495)	(-6.455)	(-5.764)	(-8.325)	(-8.550)	(-6.879)	(-5.571)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2709	2709	1374	1335	2709	2709	1374	1335
Adj R^2	0.180	0.183	0.169	0.207	0.170	0.172	0.178	0.182

Table 12: Influence of internal control effectiveness on corruption: Two-stage Heckman selection estimations

This table reports the two-stage Heckman selection regression coefficient of model 1 and model 2. Appendix A provides more detailed descriptions of variable definitions. * denotes significance at the 10% level, ** at the 5% level, and *** at the 1% level.

	Disclose	Perk1		Perk2	
Constant		8.815***	7.635***	6.086***	5.530***
		(8.702)	(6.973)	(9.913)	(8.332)
IC		**-0.165*** **	**-0.166*** **	**-0.078*** **	**-0.080*** **
		(-3.233)	**(-3.271)**	**(-2.581)**	**(-2.653)**
IC*Power			**0.096*** **		**0.040** **
			(3.051)		**(2.154)**
Power		0.065*	0.052	0.042**	0.037
		(1.803)	(1.412)	(1.964)	(1.712)
Size	-0.078***	-0.319***	-0.317***	-0.217***	-0.216***
	(-4.153)	(-5.541)	(-5.551)	(-6.092)	(-6.102)
ROA	(1.016)	-2.005**	-1.928**	-0.629	-0.590
	-0.031	(-2.153)	(-2.091)	(-1.149)	(-1.091)
Lev	(-1.962)	-0.614*	-0.608**	-0.451**	-0.447**
	0.020	(-2.041)	(-2.053)	(-2.451)	(-2.465)
Largest		-0.648**	-0.630**	-0.512**	-0.505***
		(-2.328)	(-2.271)	(-3.121)	(-3.071)
Big4	-0.406***	-0.286	-0.273	-0.100	-0.093
	(-5.521)	(-1.062)	(-1.019)	(-0.621)	(-0.591)
Central	0.214***	0.392***	0.391	0.285***	0.285
	(5.049)	(2.913)	(2.932)	(3.560)	(3.591)
Marketization		-0.001	-0.001	-0.001	-0.001
		(-0.033)	(-0.032)	(-0.031)	(-0.031)
Compensation		0.001	-0.001	-0.003	-0.004
		(0.191)	(-0.082)	(-1.190)	(-1.372)
IMR		2.445***	2.360***	1.392***	1.359***
		(3.123)	（3.042）	(2.942)	（2.879）
Growth	-0.031				
	(-0.981)				
EM	0.059				
	(0.201)				
Audit	0.324***				
	(3.067)				
Industry	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
N	5130	5130	5130	5130	5130
Wald chi2		358.26	374.98	369.97	380.06
Presdo R2	0.1044				