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Executive Compensation and Corporate Fraud in China

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Abstract This study investigates the relation between CEO compensation and corporate fraud in China. We document a significantly negative correlation between CEO compensation and corporate fraud using data on publicly traded firms between 2005 and 2010. Our findings are consistent with the hypothesis that firms penalize CEOs for fraud by lowering their pay. We also find that CEO compensation is lower in firms that commit more severe frauds. Panel data fixed effects and propensity score methods are used to demonstrate these effects. Our results also indicate that corporate governance mechanisms influence the magnitude of punishment. We find that CEOs of privately controlled firms, firms that split the posts of CEO and chairman, and CEOs of firms located in developed regions suffer larger compensation penalties for committing financial fraud. Finally, we show that CEOs at firms that commit fraud are more likely to be replaced compared to those at non-fraud firms.

Keywords Financial fraud · Executive compensation · Corporate governance · China

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Introduction

This study investigates the relation between executive compensation and corporate fraud in China, i.e., whether Chinese CEOs are penalized by receiving lower compensation if their companies commit fraud. The harm of corporate fraud to firm value is widely recognized. The Association of Certified Fraud Examiner (ACFE)'s 2012 report estimates that a typical organization loses approximately 5 % of its revenues to fraud each year. This figure translates to a potential projected annual fraud loss of more than $3.5 trillion in total if applied to the 2011 Gross World Product. Corporate fraud not only damages investors' economic interests but also undermines the integrity of the entire capital market. As a result, corporate fraud can severely weaken economic institutions that depend on a basic level of ethical corporate behavior (Harris and Bromiley 2007). From an ethical perspective, corporate fraud constitutes a direct breach of shareholder and stakeholder trust. It thus represents an ethical failure of corporate managers to perform their fiduciary duties and to fulfill their responsibilities to investors (Staubus 2005).

The problem of corporate fraud is potentially severe in China, due to its comparatively weaker financial market regulation and law enforcement compared to common law countries such as the US and the UK. Zhang (2007), for example, finds that financial fraud was detected in one-sixth of Chinese publicly traded firms from 1993 to 2004. Ding et al. (2010) similarly note that corporate fraud is severe in China because of the relative infancy of Chinese capital markets and the difficulties in implementing binding legal structures over such a short period of time. In recent years, researchers have started to investigate antecedents and consequences of financial fraud in China (e.g., Chen et al. 2005, 2006; Chen et al. 2011b; Ding et al.

2010). Studies have found that both board composition and ownership structure affect the occurrence of corporate fraud and the likelihood of enforcement actions (Chen et al. 2006; Chen et al. 2011a, b; Firth et al. 2011; Hou and Moore 2010; Jia et al. 2009). It has also been documented that firms committing fraud experienced strong negative stock market reactions at the time of enforcement actions (Chen et al. 2005; Firth et al. 2011). There is also evidence that firms committing fraud are associated with a larger probability of auditor turnover, board chair turnover, and CEO turnover (Chen et al. 2005; Ding et al. 2010; Firth et al. 2005, 2011). That is, CEOs, board members, and auditors are all more likely to be replaced in case of corporate fraud.

Our main research question is whether or not CEOs of firms committing fraud receive lower compensation. The underlying logic is that receiving lower pay punishes CEOs who harm the firm's reputation and economic interests by engaging in immoral actions. Our study is both significant and unique in the following way. First, unlike prior studies that examine stock market reaction to firms experiencing enforcement actions or study labor market consequences for top executives in these firms, we focus on whether executives suffer a compensation penalty (or discount) for committing fraud. No study to date has investigated this topic using Chinese data. We claim that replacing key executives such as CEOs is an expensive decision for the firm, which involves significant transactions costs in terms of firing then hiring a successor CEO. As an alternative to job termination, the board may switch to financial penalties to discipline executives by reducing their compensation. This prediction is augmented by consistent real-world examples where firms explicitly state in their codes of conducts to penalize CEOs by reducing their compensation. It is also supported by anecdotal cases suggesting boards do reduce CEO compensation as a response to the detection of fraud and as a way to penalize CEOs for errant behavior.

We also extend the prior literature by exploring the moderating role of ownership structure, internal governance mechanism, and regional development on the relationship between corporate fraud and compensation penalty. We investigate whether private ownership structure, a higher quality internal governance mechanism, and more developed regional legal systems lead to different patterns of executive compensation in the event of corporate fraud. Analyzing these contingencies, particularly the Chinese-specific contexts of ownership structure and regional development, enables us to contribute not only to the broad financial fraud literature (see reviews by Cohen et al. 2004; Zahra et al. 2005) but also to Chinese corporate governance research (e.g., Conyon and He 2011, 2012; Firth et al. 2006a, b, 2007).

Our paper also augments the existing financial fraud literature that largely focuses on the Western settings by exploring the impact of fraud on CEO compensation in China, a significantly different institutional context characterized as earlier stage of capitalist development, an economy in transition, new corporate governance regimes, and the dominant role of the state (Allen et al. 2005). Given different historical, legal, and institutional backgrounds between China and other western countries, automatically generalizing the findings from the latter to the former is inappropriate. As a result, an examination of the fraud and corporate governance issues in the Chinese context also helps to shed light on the discussion of convergence of corporate governance mechanisms in the world (Yoshikawa and Rasheet 2009).

Finally, our study has important practical implications. Since the credibility of China's capital market reforms hinges in part on the trust investors place in the quality of stock markets, avoiding fraud and penalizing CEOs who are responsible for corporate fraud help build trust in capital markets and ultimately advance development of the equity market and the financial system.

To anticipate our findings, we document a significantly negative correlation between CEO compensation and corporate fraud using data on publicly traded Chinese firms between 2005 and 2010. Our findings are consistent with the hypothesis that boards and owners penalize executives for fraud by lowering their pay. We also show that CEOs in privately controlled firms, CEOs without holding the board chair position, and CEOs in firms located in developed regions suffer larger compensation penalty for committing financial fraud. Our results are robust to alternative measures of CEO compensation and corporate fraud. Finally, we document that CEOs of companies engaged in fraud are more likely to be replaced compared to non-fraud firms.

The remainder of the paper is organized as follows. "Prior Studies and Institutional Context" section reviews extant literature and discusses institutional context in China. "Hypotheses Development" section presents our hypothesis, and "Data and Methods" section describes the data and methods. "Results" section presents our main results. We conduct additional analysis in "Sensitivity and Additional Analysis" section and offer our conclusions in "Discussion and Conclusion" section.

Prior Studies and Institutional Context

Zahra et al. (2005) define corporate fraud as "deliberate actions taken by management at any level to deceive, con,

swindle, or cheat investors or other key stakeholders." Corporate fraud can take a variety of forms, such as embezzlement, insider trading, self-dealing, and failure to disclose facts. The extant literature has extensively investigated antecedents and consequences of financial fraud in U.S. (see reviews by Cohen et al. 2004; Zahra et al. 2005). It has been widely documented that higher quality boards of directors or audit committees are associated with fewer incidences of financial fraud (e.g., Agarwal and Chadha 2005; Beasley 1996). Financial fraud is also affected by the design of executive incentive compensation contracts (Harris and Bromiley 2007; O'Connor Jr. et al. 2006; Zhang et al. 2008). Prior research has also documented strong negative stock market reactions to firms committing financial fraud (Palmrose et al. 2004) and a significant labor market penalty for top management and board members in these firms (e.g., Arthaud-Day et al. 2006; Desai et al. 2006; Persons 2006; Srinivasan 2005). CEOs, CFOs, and audit committee members in firms committing financial fraud are all found to be associated with a higher likelihood of turnover. There is also evidence that executives in firms committing fraud are harder to find a comparable employment after their departure (Desai et al. 2006).

Chinese Institutional Context

In recent years, a nascent field of research has started to investigate both the antecedents and consequences of financial fraud in China. China is a civil law dominion and prior research suggests that shareholder interests are less well guarded compared to common law countries like the United States (La Porta et al. 1998, 2000). The China Securities Regulatory Commission (CSRC) is the major enforcement institution for corporate fraud in publicly traded firms in China. Although Chinese Criminal Law and Securities Law specify listed firms and their top managers could face criminal and civil law suits, administrative sanctions carried out by the CSRC is the most common type. Actually, the Chinese Supreme Court has mandated that no civil lawsuits will be pursued unless the CSRC has completed its investigations and taken effective enforcement actions. Before 2002, it is the responsibility of the CSRC's Department of Inspection to execute enforcement action. It has become the duty of Administrative Punishment Committee of the CSRC afterwards (Peng 2007). The CSRC is capable of implementing a wide variety of enforcement actions, including "official warning, a monetary fine for listed firms or their top management, the return of illegally raised proceeds, the confiscation of illegal income, and the termination of securities trading qualifications" (Jia et al. 2009). In addition to enforcement actions by the CSRC, listed firms are subject to penalty imposed by two domestic stock exchanges, namely Shanghai and Shenzhen Stock exchanges, in the forms of warnings and condemnations. Compared with enforcement actions by the CSRC, stock exchanges typically watch over minor and less severe violations while more severe fraudulent activities fall into the responsibilities of the CSRC (Ding et al. 2010; Jia et al. 2009).

In terms of antecedents, Chen et al. (2006) show that firms with a larger proportion of outside directors and a long-tenured chairman are associated with a lower likelihood of corporate fraud. Jia et al. (2009) find that listed firms with larger supervisory boards are more likely to be punished by the CSRC. In addition, Firth et al. (2011) find that firms whose capital structure contains higher levels of debt are more likely to manipulate their accounting earnings. They also find that firms controlled by the central government are more likely to have fraudulent financial statements, while firms located in developed regions are less likely to commit fraud. In addition, firms with independent boards and privately controlled firms are more likely to detect and disclose false accounting reports. More recently, Hou and Moore (2010) find that retained state ownership in privatized firms increases the incidence of enforcement actions against fraud, while larger state ownership in state-owned enterprises (SOEs) is associated with a smaller likelihood of enforcement actions. They also find that more stringent regulation increases the chance of regulatory enforcement against fraud in SOEs, while it has no impact on private firms. Similarly, Chen et al. (2011b) find that SOEs are treated more favorably by the CSRC in terms punishment.

With respect to consequences, Chinese firms committing financial fraud have been found to experience significant negative stock market reactions and are also associated with a larger likelihood of auditor turnover, board chair turnover, and CEO turnover (Chen et al. 2005; Ding et al. 2010; Firth et al. 2005, 2011). Moreover, there is also evidence that both the board of directors and the supervisory board meet more frequently in the year of enforcement actions (Ding et al. 2010). Such frequent board meetings are further found to be effective in reducing the probability of future punishment.

In summary, board composition and ownership structure both affect the occurrence of corporate fraud and the likelihood of enforcement actions in China. In addition, corporate fraud in China is also associated with negative stock market responses and a higher probability of CEO and board chair turnover.

Penalizing by Pay Reductions

As discussed above, the existing corporate fraud literature in China puts heavy emphasis on the role of managerial

labor market in disciplining top executives. Because managers who commit fraud may lose their jobs and have difficulty in finding another job, the managerial labor market thus serves as an effective external corporate governance mechanism to deter managerial misconducts. Firing a CEO for corporate wrongdoing, although reasonable, may not be the only governance mechanism available to shareholders to discipline an errant CEO. Another alternative is to penalize senior managers by reducing their compensation.

In an effort to underline the practical relevance of our study, we conduct a random scan of codes of conduct documents of Chinese listed firms. Our research indicates that a lot of Chinese listed firms adopt a progressive method to discipline executives for wrongdoings, with dismissal often used as the last resort. For example, Baotou Beifang Chuangye Corp., a machine-manufacturing firm listed in Shanghai stock exchange explicitly states in its codes of conducts that executives responsible for financial frauds will be penalized in the following ways: (1) oral condemnation, (2) fines, (3) compensation reduction, (4) demotion, and (5) dismissal. Industrial Bank Corp. listed in Shanghai stock exchange likewise affirms in its codes of conducts that executives responsible for wrongdoings will suffer from the following consequences: (1) demanded correction, (2) condemnation, (3) warning, (4) fines, (5) compensation reduction, (6) demotion, and (7) dismissal. Similar terms are also found in insider-trading regulation documents of Sichuan Mingxing Electric Power Co., Great wall Technology, Tianjin Capital Environmental protection, Hunan Copote Science and Technology Co., among others.[1] The internal documents of these firms indicate a clear pattern that compensation reduction is a common disciplinary action adopted by the board of directors to punish executives for wrongdoings, which is often listed before the ultimate dismissal decision.

We also find anecdotal evidence that Chinese firms are really following this scheme to punish their executives by reducing their compensation. For example, Dikang Pharmaceutical Company was found to have failed to disclose significant financial information to shareholders in 2007. CEO compensation in 2007 was RMB 200,700, and it fell to RMB 171,900 in 2008. Similarly, following the discovery of illegal insider trading at Changzheng Electricity in 2006, CEO compensation fell to RMB 115,200 in 2007 from the 2006 level of RMB 120,000. These anecdotal examples suggest that boards do impose financial penalties on CEOs whose firms have been caught of committing fraud. Of course, we need to control for macroeconomic effects and other firm-level drivers of compensation, such as performance, ownership and board structure, to substantiate these case examples. The focus of this paper therefore is to empirically investigate how corporate fraud affects Chinese executive compensation, which has not been addressed by any previous Chinese studies to date.

Hypotheses Development

The standard theoretical framework for understanding executive compensation and corporate governance decision is agency theory (Fama and Jensen 1983; Jensen and Meckling 1976) and contracting theory (Holmstrom 1979). In the absence of complete information and credibly enforceable-contracts, agents (i.e., the CEO) might potentially behave opportunistically at the expense of the princial (i.e., shareholders). Agency costs associated with the separation of ownership and control can be mitigated by the complementary use of corporate governance mechanisms that are internal and external to the firm. Jensen (1993) identifies important factors that combine to promote effective corporate governance, which are legal and regulatory systems, the market for corporate control, competition in managerial labor market, and the firm's internal control system. The existing corporate fraud literature in China puts heavy emphasis on the role of managerial labor market in disciplining top executives, i.e., managers committing fraud tend to lose their jobs and have difficulty in finding another job.

Using the firing mechanism to discipline senior executives can be very costly for shareholders, particularly in the case of searching and training a replacement. Therefore, firing a CEO for corporate wrongdoing, although reasonable, may not be the only governance mechanism available to shareholders to discipline an errant CEO. As illustrated earlier, the board may discipline CEOs by using compensation reduction. This might happen if the net benefits of imposing a compensation penalty exceed those of CEO replacement. Indeed, this approach is consistent with the economics of crime (Becker 1968, 1993). Becker (1968) asserts that fines are preferable to imprisonment or other types of punishment because they can deter crimes if criminals have sufficient financial resources. In our

[1] The information is translated by the author from original Chinese documents of these firms. Information on Beifang Chuangye Corp is obtained from http://www.bfcy.cc/%28hyhvc1jpwgx1no45g0w2v145%29/UploadFile/2010511165428515.pdf. Information on Industrial Bank Corp. is downloaded from http://download.cib.com.cn/netbank/download/cn/Investor_Relations/20130917.pdf. Information on Sichuan Mingxing Electric Power Co. could be obtained from http://www.mxdl.com.cn/uploadfile/2013/2/18111137328.pdf.

Information on Great Wall Technology could be assessed from http://www.cec.com.cn. Information on Capital Environmental Protection could be assessed from ftp://www.tjcep.com/29aa37a4-ba25-45f2-9767-4946630877f8.pdf. Information on Copote is obtained from http://www.copote.com/pdf/zlgz/600476_2012_6.pdf.

context, the cost to the executive is also a benefit to shareholders both in deterrence and improved revenues (He and Ho 2011). Moreover, the informativeness principle from the contracting theory predicts that any variable that provides useful information to owners about CEO effort can be included in the compensation contract (Holmstrom 1979). In our context, fraud provides information of poor CEO effort and thus may affect executive pay.

Some empirical literature conducted in the U.S. context has documented a negative relationship between fraud and executive compensation. For example, Persons (2006) finds that top U.S. executives whose firms are under lawsuits are more likely to experience a reduction in their cash compensation compared to their counterparts. In addition, Cheng and Farber (2008) find that CEO's equity compensation declines significantly in the 2 years following a financial restatement. Burks (2010) documents that U.S. firms issuing earnings restatement are associated with reduced CEO bonus compensation in the post Sarbanes–Oxley period. If compensation penalty is also an important disciplining mechanism to punish Chinese CEOs for committing fraud, we make the following prediction:

H1 CEO compensation is lower in firms that have been caught of committing fraud.

An essential part of pay-for-performance literature grounded on agency theory is the normative proposition that executive compensation should be positively related to firm performance (Jensen and Murphy 1990). Existing studies on Chinese executive compensation have documented a positive correlation between executive pay and firm performance (Buck et al. 2008; Conyon and He 2011, 2012; Firth et al. 2006a, 2007; Kato and Long 2006a). These results indicate that Chinese boards do adjust executive cash compensation based on accounting or financial performance of public firms. Corporate fraud is financially costly for listed firms (Chen et al. 2005; Firth et al. 2011). As a result, penalizing executives by reducing their compensation is in line with the fundamental principle of pay-for-performance advocated by agency theory.

The financial fraud literature has documented that not all forms of fraud are equal in terms of their impact on equity prices. For example, Palmrose et al. (2004) find that a financial restatement related to a correction of intentional violation of GAAP standards elicits much stronger negative stock price reaction compared to an error-related financial restatement in US. Chen et al. (2011b) find that more severe financial frauds committed by Chinese listed firms, such as failure to disclose materials matters in time, disclosure of false information, or price manipulation, affect firms' ability to apply for refinancing much more strongly than minor violations. These results indicate that more severe financial fraud is associated with larger economic losses for shareholders. If top executives are to be held accountable for financial fraud of their firms, we expect that the magnitude of compensation penalty should be related to the severity of financial fraud. That is, executives would suffer a larger compensation penalty when financial fraud is more severe. This leads to our next hypothesis

H2 CEO compensation is negatively related to the seriousness of corporate fraud.

China has several unique characteristics that make it relevant for studying ethics generally and corporate fraud in particular. A unique feature of Chinese public firms is the importance of ownership structure in influencing the effectiveness of corporate governance and executive compensation. Specifically, a significant proportion of Chinese listed firms are partially privatized SOEs. The distinction between SOEs and non-SOEs is important in light of differences in ownership, monitoring and control mechanisms (Peng et al. 2010). Compared to privately controlled firms, the state and parent SOEs still retain sufficient shares in SOEs to retain voting control and are often able to exert significant political influences on these firms (Fan et al. 2007). States' shares in SOEs are held by such agencies as the state asset management bureaus or local finance bureaus. These agencies do not have cash flow rights from the shares they hold. Government bureaucrats in these agencies are selected through political processes, and typically have very low incentives and limited capabilities to monitor the firm and maximize shareholder value (Conyon and He 2011, 2012). Consequently, the extant Chinese corporate governance literature has documented that SOEs typically possess lower corporate governance quality and more serious agency conflicts.

First of all, SOEs are less likely to link CEO compensation to firm performance. Firth et al. (2007) and Conyon and He (2011) both document that the sensitivity of executive pay to firm performance is significantly lower in SOEs than in privately controlled public firms. Hou et al. (2014) find that the split-share structure reform that privatizes SOEs leads to a stronger relationship between executive compensation and stock market performance. SOEs are also found to be inferior in disciplining CEOs for poor performance. For example, both Kato and Long (2006b) and Firth et al. (2006b) find that only CEOs in privately controlled firms are disciplined by poor firm performance, while no significant correlation between CEO turnovers and firm performance is found in SOEs. Therefore, we expect that state ownership weakens investor protection in Chinese listed firms, which would

consequently lead to a smaller compensation penalty for CEOs in firms committing fraud.

A few prior studies on fraud have also echoed this point. Chen et al. (2011b) document that SOEs face less severe and more delayed punishment when committing fraud. Hou and Moore (2010) have likewise shown that larger state ownership in SOEs is associated with a smaller likelihood of enforcement actions. Chen et al. (2013) suggest that the sensitivity of CEO turnover to enforcement action is smaller in SOEs than in non-SOEs. Overall, this evidence suggests that SOE managers are less likely to receive penalty for corporate fraud compared to their non-SOE counterparts. Taken together, we expect that:

H3 The negative association between CEO compensation and corporate fraud is more pronounced in privately controlled firms than in State-Owned Enterprises (SOEs).

The capability of a board to penalize fraudulent behavior is also dependent on the quality of board monitoring, which is affected by board composition. Kato and Long (2006a, b) assert that internal governance affects executive compensation outcomes and the disciplining of top executives. It has long been argued that a combined CEO and chairperson post gives the CEO excessive power and hinders board independence (Peng et al. 2010; Rechner and Dalton 1991). For example, there is evidence showing that executive compensation is lower, and pay–performance relationship is stronger in Chinese firms with separate leadership positions compared to firms with a combined leadership post (Conyon and He 2011; Firth et al. 2007). The extant literature has also documented a weaker relationship between CEO turnover and firm performance when leadership position is combined in both the U.S. context (Goyal and Park 2002) and the Chinese context (Firth et al. 2006b). Overall, these studies suggest that separating the posts of CEO and chairperson helps to reduce managerial entrenchment and better discipline top executives for committing fraud, which leads to our next hypothesis:

H4 The negative association between CEO compensation and corporate fraud is more pronounced in firms where the posts of CEO and Chairman are separated rather than combined.

The institutional environment facing by Chinese firm is heterogeneous across regions. It has been noted that the market development process has progressed to varying degrees in China's different regions. Typically, the eastern coastal areas are more developed than other regions such as the central or western provinces. For example, the World Bank (2006) report indicates that per capita GDP in southeast China averages more than 50 % above the level of the northeast and 150 % above the average for central and southwest China. There are also large regional differences in terms of business climate. A more developed province typically has more effective local governments with less exploitation and less intervention of businesses, more advanced and effective financial intermediaries, more mobile labor markets, and better law enforcement (Fan et al. 2011).

Prior empirical studies using Chinese data have found that regional differences affect firm-level practices and outcomes. For example, Firth et al. (2010) suggest that the pay-for-performance relationship is weaker for firms located in less developed provinces. Firth et al. (2011) further indicate that firms located in more developed provinces are less likely to initiate financial restatements, but suffer more severe consequences when they do restate. Overall, these prior studies suggest that external governance and legal protection are stronger in more developed regions than in less developed regions. Based on these arguments, we predict that managers whose firms residing in more developed regions are subject to more effective external monitoring and are more likely to be penalized for their fraudulent behaviors. This gives rise to our next hypothesis:

H5 The negative association between CEO compensation and corporate fraud is more pronounced in firms located in developed regions compared to less developed regions.

Data and Methods

Data and Sample Selection

The primary data on executive compensation, ownership, internal governance structure, as well as financial and market information are obtained from the China Stock Market and Accounting Research database (CSMAR) provided by GuoTaiAn Information Service (GTA). The CSMAR data cover all firms listed in Shanghai and Shenzhen stock exchanges. Data from these sources have been used in previous Chinese executive compensation and corporate fraud studies such as Conyon and He (2011, 2012), Firth et al. (2007, 2010, 2011), Hou and Moore (2010).

Our study uses data on publically traded firms over the period of 2005–2010. The start year is 2005 because this is the first year that individual CEO compensation information is available under Chinese disclosure and reporting requirements.[2] Our final sample consists of 1,471 firms and

[2] Prior to this, only average data for the top management team are accessible. We discuss this in the sensitivity analysis section later in this paper.

5,061 firm years from 2005 to 2010. For this set of firm years, we have complete information on CEO compensation and other necessary firm-level variables for the main analysis, as described in next sub-section. Because CEO turnover can potentially confound the correlation between CEO compensation and fraud, we exclude those firm years in which the company replaced its CEO. However, our empirical findings are not affected by imposing this restriction, as we document in the results section.

Our measures of company fraud are supplied by CSMAR as well. The CSMAR fraud data collect information in the announcements disclosed by violating companies, reports published on the media designated by the CSRC, and announcements issued by regulatory authorities such as the CSRC. It includes violation events disclosed by the CSRC and both stock exchanges. Our final data contain a total of 366 violations over 2005–2010. The yearly distributions of these fraud enforcement events are as follows: 2005: 93; 2006: 68; 2007: 53; 2008: 36; 2009: 66; 2010: 50.

Variable Measurement

The dependent variable is log CEO pay. We measure CEO compensation as the reported sum of basic salary, bonus, and stipends in our main analysis to be consistent with prior literature such as Conyon and He (2012).[3]Because Chinese firms do not report components of executive compensation such as bonus, we are not able to single out variable pay in the compensation package, but have to rely on the aggregated level of total compensation. As is common in compensation research, a logarithmic transformation is performed on the compensation variable to account for the fact that pay is positively skewed (Firth et al. 2006a, b, 2007, 2010; Conyon and He 2011, 2012).

One concern with our measure of CEO compensation, and a common issue with all studies using executive pay data in China at the moment, is that reported pay data may underrepresent the true nature of rewards received by CEOs. Most importantly, equity compensation in the forms of stock options or restricted stocks may be granted to executives, although it is rare and only permitted since 2006 (Conyon and He 2012). We thereby replace our main measure of CEO compensation with CEO total compensation including estimated value of stock option and restrictive stock grants in our sensitivity analysis. During our sample period, a total of 97 firms have granted equity incentives to their CEOs. The yearly distribution of firms and the percentage of firms granting equity incentives are 2006 = 18 (1.26 %), 2007 = 7 (0.45 %), 2008 = 25 (1.56 %), 2009 = 16 (0.91 %), and 2010 = 31 (1.47 %).

Chinese executives might also receive undisclosed perks from their companies, although the price of these is frequently difficult to value (Adithipyangkul et al. 2011; Kato and Long 2006a). A limited number of studies have used voluntarily disclosed perk-related expense information such as business travel expenses, business entertainment expenses, company car expenses, and meeting expenses to estimate the value of executive perks (Gul et al. 2011). The problem of this method, however, is that it not only significantly reduces sample size but also contaminates the sample quality due to the underlying self-selection problem, that is, only firms without excessive perk consumption choose to disclose these items. In this paper, we choose to ignore the estimation of perk consumption in our CEO compensation measure. However, we highly recommend that the results of this paper—as with all other similar studies using Chinese data—be seen in the light of the inherent measurement difficulties that researchers face in assembling accurate Chinese pay data.

Our main independent variable is company fraud. Two measures are used. First, we create a dummy variable, which is called 'Fraud' set to one when there is an enforcement action in a given year and zero otherwise. This is the year the firm is found to have committed fraud.[4] GTA also provides data on the number of years affected by the financial fraud. In some cases, a fraud may affect multiple financial years, which we assume should be more serious than those only affecting 1 year. As a result, we count the number of affected years as a proxy for seriousness of violation and construct a continuous variable, which we call 'Serious fraud.' It is the integer count of the number of years the fraud was perpetrated.[5] In our sensitivity analysis, we also adopt three alternative measures of serious fraud to better capture this construct. Specifically, we have also classified serious fraud based on types of prosecutors, the total number of violations, and types of frauds.

We use 'SOE' to indicate whether the firm is a state-owned enterprise and zero otherwise. Other ownership

[3] The title "Chief Executive Officer" or "CEO" is not commonly used in the GTA dataset. In this study, we identify the CEO position by the title "General Manager" or "President." This captures most CEOs. We also manually checked other titles such as "Administrative President," "Executive President" in cases where current CEO compensation data were missing.

[4] The firm might have been committing fraud for several years prior to this announcement.

[5] The GTA provides information on "Date of violation" (Vltyear) to identify financial years affected by a specific fraud. For example, an entry may be "1998, 1999, 2000, 2002," which suggests the fraud affects and involves all these financial years. We count the number of years listed in the entry to capture Serious Fraud. It is coded as 4 in the above-mentioned example. When there are multiple violations in a given year, the count is aggregated within the year.

variables are also included. We create 'Foreign' to measure the presence of foreign ownership in listed firms, which is equal to one when the controlling shareholder of the listed firm is a foreign entity. 'Largest Shareholder' represents the percentage ownership of the controlling shareholder. We measure leadership duality with a dummy variable, 'Combine,' with one indicating a combined CEO and chairperson position and zero otherwise. We also control for other elements of board structure. Specifically, 'Board size' captures the number of board members. 'Comp. Comm.' is equal to 1 if the firm has a compensation committee and 0 otherwise. 'Audit Comm.' is created in the same way. 'Outside director' is equal to 1 if the percentage of independent directors on the board is larger than one-third. In addition, we include 'CEO Age' and 'CEO Tenure' to capture the influence of CEO characteristics on compensation.

We measure regional market development level using the widely adopted NERI marketization index compiled by Fan et al. (2011), which is an annual index created for each of the 31 Chinese provinces as well as four municipalities directly under control of the central administration.[6] We use the location of these listed firms' headquarters to identify market environment the firm is facing and denote the variable as 'Regional Development.' In addition to this continuous measure, we also create a dummy variable 'Developed' indicating that the firm is located in a developed region with above median NERI score.

Our executive compensation models also contain a set of firm-level control variables. Specifically, we include a dummy variable 'Auditor' to indicate quality of the external auditor. This variable is equal to one if the auditor is one of the largest eight auditors in China ranked by assets (Chen et al. 2011a; Defond et al. 2000). We include the log of sales as a measure of company size and complexity and denote it as "Log Sales." We include two company performance measures (Firth et al. 2006b, 2007). The first is an accounting measure capturing the return on assets (denoted as Return on Assets). The second measure is a market-based variable reflecting total returns to stockholders (denoted as Stock Returns). We also include a measure of the firm's growth opportunities using market to book ratio, 'Market to Book' (Conyon and He 2011, 2012). We include a measure of firm risk, 'volatility,' using the standard deviation of stock returns measured on a rolling basis over the previous 36 months (Conyon and He 2011, 2012). Each of the regression models also contains a set of industry dummy variables to capture industry variations. The industry classification is based on the CSRC's industry classification codes.[7] Finally, we include a set of time dummies to capture year effects. Variable definitions are summarized in Appendix.

Statistical Methods

To test our hypothesis, we estimate a general linear model containing firm-level fixed effects. Specifically, we estimate the following executive compensation model:

$$\log(y)_{it} = \alpha_i + \beta F_{i,t-1} + \gamma X_{i,t-1} + \lambda_t + \varepsilon_{it}, \quad (1)$$

where $\log(y)_{it}$ is the log of CEO pay in firm 'i' at time 't'. The term F is a measure of company fraud. The matrix X_{it} contains a set of firm-level determinants of CEO pay as specified above. The term λ_t captures macroeconomic shocks via a set of time dummy variables. The term α_i is a set of firm fixed effects. These are included to control for any unobserved non-time varying factors that influence executive compensation.[8] Lastly, the equation error term ε_{it} is assumed to be independent and identically distributed. The term β is the main population parameter to be estimated whose hypothesized sign is negative. The vector γ is a set of reaction coefficients associated with the control variables in X.

To demonstrate the hypothesized importance of fixed effects, our initial set of results also report ordinary least squares estimates (OLS) of the CEO pay equation. Specifically, we constrain the fixed effects to be constant across all firms, that is $\alpha_i = \alpha$. When doing so, we also include a full set of industry indicator variables in the OLS models. It is important to note that all of the right-hand side variables are lagged by one time period. This helps identify the potential causal effect of a given variable on the outcome CEO pay variable. Specifically, we are interested in

[6] The NERI index covers marketization level of four direct-controlled municipalities and twenty-seven provinces. The four direct-controlled municipalities are Beijing, Shanghai, Tianjin, and Chongqing. The 27 mainland provinces (excluding Taiwan, Hong Kong, and Macau) include Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Neimeng (Inner Mongolia), Ningxia, Qinghai, Sangxi, Shandong, Shanxi, Sichuan, Xizang (Tibet), Xinjiang, Yunnan, and Zhejiang.

[7] The CSRC classifies Chinese industries into 22 categories: Agriculture and fishery; Mining; Manufacturing-food/beverage; Manufacturing-Textiles; Manufacturing-Furniture; Manufacturing-Paper/Printing; Manufacturing-Petroleum; Manufacturing-Electronic; Manufacturing-Metal/Non-metal; Manufacturing-Machines; Manufacturing-Pharmaceutical; Manufacturing-others; Electricity, water, and other energy manufacturing and supply; Construction; Transportation and logistics; Information technology; Wholesales and retails; Finance and insurance; Real estate; Service; Communication; and Others.

[8] For example, the statistician does not typically observe CEO and management quality but these are nevertheless important determinants of executive pay. Their exclusion leads to an omitted variable bias problem that can be partially ameliorated by including firm fixed effects.

whether fraud detected today results in a CEO compensation discount tomorrow.

One issue with the estimation is that the correlation between CEO pay and fraud is confounded by CEO turnover. For example, CEOs might be fired for committing fraud and our model might be picking up the effects of CEO turnover on executive pay and not wholly the effects of firm fraud. Because of this, we exclude those firm years when there is a CEO turnover from our CEO pay regressions. Our main results, therefore, are based on data where there is no CEO replacement.

Results

Descriptive Statistics

Table 1 provides some basic statistics on fraud in publicly traded firms in China. Table 1a list types of fraud, which range from illegal share buybacks, making up profit, illegal speculations and guarantees, major embezzlement of shareholders, false disclosures, to failure to disclose relevant and pertinent information. The most frequent types of fraud violations relate to disclosure. 75 cases are related to a major failure to disclose information to stockholders, constituting approximately 21 % of the sample. In 25 cases, or about 6.93 % of the sample firms, the fraud involved false disclosures on the part of the firm. Another 61 cases (16.9 % of the sample) were related to delayed disclosure.

Table 1b classifies these fraud events based on three methods to indicate seriousness of fraud. First, we use a count variable to determine the number of years the fraud was perpetrated. The distribution of these fraud lengths is given in Table 1b. There were 120 observations, or about 33 % of the sample, whose fault lasted for 2 years. There were 105 observations, or about 29 % of the sample, whose fraud lasted for 3 or more years. We also measure the seriousness of fraud by the number of violations actually involved. Table 1b shows that approximately 46 % of fraud events involved only one violation, 32 % of fraud events involved two violations, and approximately 21 % of fraud events involved 3 or more violations. Yet another alternative measure of serious fraud is who identified the fraud at the first place. We find that the CSRC detected and imposed enforcement actions on about 44 % of cases, and the rest of cases were detected by the two domestic stock exchanges.

Table 2 provides basic descriptive statistics along with a correlation matrix. The average number of fraud events in the data is approximately 4 %, and the mean of serious fraud is 0.08. We find that approximately 53 % of the sample firms are SOEs and approximately 2 % of firms are foreign owned. In addition, 15 % of sample firms have a combined CEO and chairperson position. 61 % of firms have a compensation committee and 95 % of firms have a board with at least one-third of independent directors. We find that return on assets is approximately 0.02, total shareholder returns is approximately 0.58, and the market to book ratio is approximately 1.68. Table 2 also suggests that CEO pay is negatively correlated with both fraud and serious fraud.

Regression Results

Table 3 contains our main regression results to test hypotheses 1 and 2. Columns 1 and 2 of Table 3 contain ordinary least squares (OLS) estimates. Columns 3 and 4 contain panel data fixed-effects estimates. Consider first the OLS estimates. We find that CEO compensation is approximately 13.7 % lower in firms committing fraud (column 1). We also document that CEO pay is negatively related to the seriousness of fraud as measured by the number of years over which the fraud was perpetrated. An additional year of perpetration is associated with 5.0 % lower CEO pay. H1 and H2 are both confirmed.

The fixed-effects results also document a negative correlation between CEO compensation and company fraud. We find that CEO pay is approximately 7.6 % lower in firms committing fraud after controlling for fixed effects (column 3). We also find that CEO pay is approximately 5.0 % lower in firms committing serious fraud (column 4). Compared to the OLS estimates, the fixed-effects models generally produce lower quantitative estimates for the standard fraud variable, suggesting that part of the OLS estimate is picking up unobserved factors such as CEO quality. Overall, the empirical results illustrate a robust negative and significant correlation between executive compensation and company fraud. Both hypotheses 1 and 2 are confirmed by the data.

Recall that we exclude firm years when there was a CEO turnover because of the potential confounding effect of CEO replacements. We check that this statistical restriction does not unduly influence our results by re-estimating the fixed-effects models on unrestricted samples and find broadly similar results. In our un-tabulated tables, the coefficient (standard error) on the fraud variable is −0.083 (0.042) in the model akin to column 1 of Table 3. The coefficient (standard error) on our serious fraud variable is −0.028 (0.016). Both are significant at the conventional level. We conclude that although conceptually important to make sure that CEO turnovers are not driving our results, the broad thrust of Hypotheses 1 and 2 remains intact even if we leave CEO replacements in our dataset.

We also compare firms committing serious fraud with firms committing less serious fraud and exclude firms never

Table 1 Descriptions of fraud

Violation type	Frequency	%
a: Types of fraud violation in China		
Illegal share buyback	28	7.76
Profit make up	2	0.55
Postponed disclosure	61	16.90
False disclosures	25	6.93
Capital contribution violation	1	0.28
Major failure to disclose information	75	20.78
Major embezzlement of shareholders	35	9.70
Price manipulations	10	2.77
Illegal guarantees	23	6.37
Illegal speculations	10	2.77
Other fraud types	96	25.21
Total	366	100.00

Variable	Outcome	Frequency	%
b: Serious fraud			
Serious fraud: # of affected years	1 year	136	37.67
	2 years	120	33.24
	3 or more years	105	29.09
Serious fraud: # of violations	One violation	169	46.30
	Two violations	120	32.88
	Three or more violations	77	20.82
Serious fraud: type of prosecutor	CSRC	162	44.26
	Finance Department	1	0.27
	Shanghai Stock Exchange	64	17.49
	Shenzhen Stock Exchange	149	37.98

Data source: GTA. 'serious fraud: # of affected years' is the number of years over which the fraud was perpetrated. 'Serious fraud: # of violations' is the number of different violations that the company committed. 'Serious fraud: type of prosecutor' is identity of the regulator who identified/revealed/prosecuted the company fraud

committing fraud. In the fixed-effects results (analogous to column 4 of Table 3 with the restriction that the firm was found to have committed at least one fraud), we find a statistically significant estimate of −0.048 (0.017) on the serious fraud variable.[9]

The control variables are important and also point to the general adequacy of our CEO compensation model. We find that CEO pay is higher in larger firms, firms with a greater return on assets, higher market to book ratios, firms that are foreign controlled, and those located in more developed regions. We also find that CEO pay is higher in firms with a larger board, a combined CEO and chairperson post, a compensation committee, and an independent board. CEO age is also an important predictor of executive pay. In addition, we find that CEO compensation is negatively correlated to ownership concentration and state ownership. Our results are broadly consistent with the extant Chinese literature in this regard (Buck et al. 2008; Conyon and He 2011, 2012; Firth et al. 2006a, 2007; Kato and Long 2006a).

Table 4 contains tests of hypothesis 3 through 5. In essence, these evaluate the correlation between CEO compensation and corporate fraud contingent upon China's unique institutional structure. Columns 1 and 2 focus on differences between SOEs and privately controlled firms; columns 3 and 4 focus on differences in internal corporate governance structure, specifically whether the firm separates the CEO and chairman roles or not; and finally, columns 5 and 6 focus on the degree of regional market development. Our goal is to see whether the correlation between CEO pay and fraud is different in these subsample splits.

First of all, we find that in privately controlled firms, there is a negative and statistically significant association between the log of CEO pay and fraud, with an estimated

[9] The restriction reduced the number of firms in the sample to 307 and the number of firm years to 1028.

Table 2 Descriptive statistics

		Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Log CEO pay	12.47	0.91	1.00																
2	Fraud	0.04	0.19	−0.09*	1.00															
3	Serious fraud	0.08	0.50	−0.09*	0.83*	1.00														
4	Combine	0.15	0.36	0.07*	0.02*	0.01	1.00													
5	Comp. Comm.	0.61	0.49	0.15*	−0.02*	−0.02*	−0.02	1.00												
6	Outside director	0.95	0.21	0.09*	−0.02*	−0.02	0.01	0.09*	1.00											
7	Board size	9.43	2.10	0.14*	−0.06*	−0.05*	−0.11*	0.01	−0.01	1.00										
8	SOE	0.53	0.49	−0.07*	−0.06*	−0.05*	−0.14*	−0.02	−0.06*	0.17*	1.00									
9	Largest shareholder	0.37	0.16	−0.03*	−0.07*	−0.06*	−0.06*	−0.07*	−0.04*	−0.01	0.29*	1.00								
10	Foreign	0.02	0.14	0.09*	−0.02	−0.01	0.02	−0.02	0.02	0.03*	−0.16*	−0.02*	1.00							
11	Auditor	0.22	0.41	0.18*	−0.02*	−0.02*	−0.04*	0.03*	0.01	0.15*	0.02	0.08*	0.05*	1.00						
12	Log sales	20.77	1.59	0.37*	−0.15*	−0.13*	−0.10*	0.09*	0.02*	0.29*	0.21*	0.25*	0.03*	0.23*	1.00					
13	ROA	0.02	0.21	0.17*	−0.17*	−0.13*	−0.03*	0.02*	0.06*	0.06*	0.05*	0.08*	0.01	0.03*	0.21*	1.00				
14	Stock returns	0.58	1.17	0.13*	−0.01	−0.01	0.00	0.13*	0.05*	−0.02	−0.06*	−0.06*	−0.01	−0.02*	0.06*	0.09*	1.00			
15	Market to book	1.68	1.66	0.09*	0.00	−0.01	0.12*	0.06*	0.04*	0.14*	−0.17*	−0.06*	−0.02	−0.03*	−0.27*	0.00	0.41*	1.00		
16	Volatility	0.52	0.32	0.09*	0.03*	0.02*	0.03*	0.18*	0.04*	−0.09	−0.11*	−0.05*	0.00	−0.02*	−0.05*	0.00	0.26*	0.23*	1.00	
17	Regional development	8.71	2.26	0.39*	−0.06*	−0.06*	0.09*	0.15*	0.12*	−0.02	−0.18*	−0.04*	0.08*	0.20*	0.16*	0.04*	0.07*	0.12*	0.12*	1.00

Variables are defined in Appendix

* Significant at 0.05 level

Table 3 CEO compensation and fraud in China

	(1) Log CEO pay OLS	(2) Log CEO pay	(3) Log CEO pay Fixed effects	(4) Log CEO pay
Fraud [H1]	−0.137** (0.059)		−0.076** (0.041)	
Serious fraud [H2]		−0.050** (0.026)		−0.050*** (0.017)
Comp. Comm.	0.083*** (0.023)	0.082*** (0.023)	0.057** (0.029)	0.055* (0.029)
Outside directors	0.186*** (0.051)	0.188*** (0.051)	0.034 (0.059)	0.034 (0.059)
Combine	0.124*** (0.028)	0.124*** (0.028)	0.156*** (0.051)	0.155*** (0.051)
Board size	0.017*** (0.006)	0.017*** (0.006)	0.014 (0.012)	0.014 (0.012)
SOE	−0.051** (0.023)	−0.051** (0.023)	−0.056* (0.029)	−0.056* (0.029)
Largest shareholder	−0.005*** (0.001)	−0.005*** (0.001)	−0.001 (0.002)	−0.001 (0.002)
Foreign	0.422*** (0.071)	0.423*** (0.071)	−0.061 (0.083)	−0.059 (0.083)
CEO age	0.007*** (0.002)	0.007*** (0.002)	–	–
CEO tenure	0.014 (0.011)	0.014 (0.011)	–	–
Auditor	0.118*** (0.026)	0.117*** (0.026)	−0.015 (0.038)	−0.016 (0.038)
Log sales	0.222*** (0.010)	0.222*** (0.010)	0.157*** (0.023)	0.157*** (0.023)
Return on assets	0.378*** (0.112)	0.381*** (0.112)	0.211** (0.090)	0.214** (0.090)
Stock returns	0.016 (0.015)	0.017 (0.015)	−0.010 (0.010)	−0.010 (0.010)
Market to book	0.065*** (0.010)	0.065*** (0.010)	0.012 (0.009)	0.012 (0.009)
Volatility	−0.009 (0.036)	−0.008 (0.037)	0.044 (0.062)	0.042 (0.062)
Regional development	0.092*** (0.005)	0.092*** (0.005)	−0.065*** (0.025)	−0.065*** (0.025)
Constant	6.417*** (0.212)	6.406*** (0.212)	10.000*** (0.588)	10.004*** (0.587)
Industry effects	Yes	Yes	No	No
Year effects	Yes	Yes	Yes	Yes
Observations	4,562	4,562	4,562	4,562
R^2	0.401	0.400	0.357	0.358
Number of firms	NA	NA	1,471	1,471

The dependent variable is the log of CEO pay. Fraud = 1 if the fraud is revealed in a given year, and 0 otherwise. Serious fraud = number of years over which the fraud was perpetrated. Other variables are defined in Appendix. Robust standard errors are reported in the parentheses

*** Significant at 0.01, ** significant at 0.5, * significant at 0.10

coefficient of −0.19. In sharp contrast, there is no correlation between CEO pay and fraud in the sample of SOEs. The difference in coefficients is also statistically significant at the 0.10 level, with the Chi-square estimate equals to 2.79. The evidence is consistent with our H3 that the relationship between CEO compensation and corporate fraud is stronger in privately controlled firms than in SOEs.

Hypothesis 4 asserts that the relationship between CEO compensation and corporate fraud is stronger in firms with separate leadership structure compared to firms without. The evidence is consistent with this. In the sample firms that separate the posts of CEO and chairman, we find that there is a negative correlation between CEO pay and corporate fraud with an estimated coefficient of −0.157. In contrast, in the sample firms that combine the posts of CEO and chairman, we do not find a statistically significant correlation between pay and fraud. The difference is also statistically significant at the 0.10 level with the Chi-square estimate being 3.19.

Finally, we find that the correlation between CEO pay and corporate fraud is negative and significant in developed regional markets. The coefficient estimate is −0.256. In contrast, we find no evidence of a correlation between CEO pay and fraud in underdeveloped regional markets. The coefficient difference is statistically significant at the 0.05 level, with a Chi-square estimate of 5.12. The empirical evidence thus is consistent with H5, i.e., the relationship between CEO compensation and corporate fraud is stronger in firms located in developed regions compared to firms in less developed regions.

Sensitivity and Additional Analysis

Endogenous Fraud: A Propensity Score Matching Approach

Our results up to this point have mainly assumed that our measures of fraud are exogenous. However, there are

Table 4 CEO compensation and fraud in China: subsample analyses

	Log CEO pay [H3]		Log CEO pay [H4]		Log CEO pay [H5]	
	(1) SOE	(2) Private	(3) Combine	(4) Separate	(5) Developed	(6) Underdeveloped
Fraud	0.014 (0.091)	−0.194** (0.081)	−0.115 (0.119)	−0.157** (0.073)	−0.241*** (0.075)	0.058 (0.110)
Comp. Committee	0.095*** (0.032)	0.036 (0.034)	0.118** (0.053)	0.068** (0.026)	0.077*** (0.028)	0.130*** (0.050)
Outside directors	0.209*** (0.064)	0.088 (0.100)	0.138 (0.128)	0.176*** (0.061)	0.246*** (0.072)	0.142* (0.085)
Combine	0.104** (0.041)	0.159*** (0.037)	–	–	0.138*** (0.032)	0.196*** (0.062)
Board size	0.017** (0.008)	0.024*** (0.008)	0.027** (0.014)	0.020*** (0.006)	0.023*** (0.007)	0.013 (0.010)
SOE	–	–	−0.041 (0.053)	−0.011 (0.026)	−0.035 (0.028)	−0.119** (0.047)
Largest shareholder	−0.005*** (0.001)	−0.006*** (0.001)	−0.010*** (0.002)	−0.004*** (0.001)	−0.005*** (0.001)	−0.006*** (0.001)
Foreign	−0.314*** (0.089)	0.377*** (0.075)	0.223* (0.122)	0.413*** (0.089)	0.439*** (0.081)	0.096 (0.182)
CEO age	0.005* (0.003)	0.010*** (0.002)	0.011*** (0.003)	0.008*** (0.002)	0.007*** (0.002)	0.014*** (0.004)
CEO tenure	−0.002 (0.017)	0.034** (0.015)	0.026 (0.028)	0.013 (0.013)	0.010 (0.014)	0.027 (0.020)
Auditor	0.150*** (0.035)	0.118*** (0.039)	0.162** (0.065)	0.136*** (0.028)	0.225*** (0.029)	0.053 (0.063)
Log sales	0.175*** (0.014)	0.220*** (0.013)	0.185*** (0.023)	0.211*** (0.010)	0.212*** (0.011)	0.248*** (0.021)
Return on assets	2.380*** (0.283)	0.195** (0.090)	0.257 (0.203)	0.509*** (0.140)	0.329*** (0.110)	1.315*** (0.276)
Stock returns	−0.010 (0.024)	0.024 (0.020)	0.085** (0.043)	0.000 (0.017)	−0.008 (0.019)	0.035 (0.028)
Market to book	0.042** (0.018)	0.059*** (0.011)	0.070*** (0.022)	0.071*** (0.011)	0.078*** (0.012)	0.048** (0.020)
Volatility	0.031 (0.065)	0.017 (0.044)	−0.411*** (0.113)	0.041 (0.035)	−0.011 (0.053)	−0.046 (0.046)
Regional development	0.121*** (0.007)	0.086*** (0.007)	0.107*** (0.014)	0.103*** (0.005)	–	–
Constant	7.273*** (0.318)	6.313*** (0.294)	7.133*** (0.494)	6.334*** (0.229)	7.282*** (0.253)	6.184*** (0.459)
Industry/year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,181	2,381	897	3,659	3,415	1,147
R^2	0.413	0.335	0.340	0.365	0.279	0.359

The dependent variable is the log of CEO pay. Fraud = 1 if a fraud is revealed in a given year, and 0 otherwise. Other variables are defined in Appendix. Robust standard errors are reported in the parentheses

*** Significant at 0.01, ** significant at 0.5, * significant at 0.10

reasons to believe that company fraud is endogenous and depends on the probability of being caught, as well as costs and benefits associated with that fraud (Becker 1968). For example, CEOs of smaller firms might think that the probability of getting caught is low so might be more inclined to commit fraud. CEOs with private information that their firm's corporate strategies are unsound in the long-run might also have a propensity to commit fraud. Prior research using China data has also indicated that fraud and enforcement actions are affected by many firm-level characteristics (e.g., Chen et al. 2005, 2011b; Firth et al. 2005, 2011; Hou and Moore 2010). Generally, the concern is that there are selection effects whereby CEOs and companies that commit fraud are different from those that do not. The problem, as is well known, is very difficult to fully resolve. We thereby use propensity score methods to partially resolve such selection effects (Angrist and Pischke 2009; Rosenbaum and Rubin 1983).[10]

The goal of propensity score matching (Heckman et al. 1997, 1998; Imbens 2000) is to find a set of non-fraud control firms that can be matched optimally to the set of firms that have committed fraud. The treatment (fraud) firms and control group (non-fraud) firms are made to be as statistically alike as possible for other variables including economic and corporate governance characteristics using a matching algorithm. Having done this, one can compare average CEO compensation between the treatment (fraud firms) and control groups (non-fraud firms) because they are statistically alike in all other economically relevant characteristics that may affect CEO compensation. Consistent with much of the program evaluation literature, we document the average treatment effect of the treated (i.e., ATT).

[10] Endogenous selection is potentially a serious problem especially as the number and frequency of firms committing fraud in the population of public enterprises are, in fact, low. Another solution to the problem

Footnote 10 continued
is instrumental variables. However, the difficulty here is that it is problematic to find a legitimate theoretical instrument that is correlated with the propensity to commit fraud (the relevance criteria) and is also uncorrelated to executive compensation (the exclusion criteria). In consequence, any chosen instrument set might turn out to be theoretically somewhat arbitrary.

Table 5 presents estimates of the basic propensity score model. We estimated probit models and report the marginal effect estimates for each of the two models.[11] Both models contain a set of firm-level variables as well as industry and time dummy variables. We do not claim to model precisely the likelihood of fraud with these models. The aim of the propensity score method is to produce two statistically similar samples (one fraud group and the other non-fraud group) according to included covariates. Column 1 reports results using the indicator variable for fraud. Column 2 reports results for the indicator variable of serious fraud, which equals to 1 if the fraud lasted for 2 or more years and 0 otherwise.[12] The results from the two models are qualitatively similar. We find that fraud is less likely in firms with an audit committee or a more reputable external auditor, in larger firms, in state-controlled firms, and firms with better stock market performance. In contrast, the variables that are (conditionally) insignificant suggest that there is no difference between fraud and non-fraud firms based on these variables. Based on these results, we predict the propensity score and choose to match firms on a one-to-one basis on the closeness of the predicted probabilities to commit fraud. We can conclude from our models that fraud is potentially endogenous and is determined by a set of firm-level ownership, economic and corporate governance factors.

Table 6 contains estimates of the causal effect of fraud on executive compensation based on the propensity score estimates arising from the models in Table 5. In model 1, we see that the difference between the treated (i.e., fraud) firms and the control group is minus 0.52 and is statistically significant (t statistic $= -7.37$) in the unmatched samples. This can arise because firms in the treatment group have different characteristics from those in the control group. After matching, the mean of the treated group is now 12.04, the mean of the control group is 12.35, and the difference is -0.31. Again, this is statistically significant (t statistic -2.85). A similar pattern is found for the serious fraud model. In the matched sample, the mean of the treated group is 11.90, the mean of the control group is 12.28, and the difference of -0.38 is statistically significant (t statistic -2.57). We conclude that propensity score matching models establish a negative and statistically significant difference in compensation arrangements of fraud and non-fraud firms. The results are consistent with our hypotheses 1 and 2.

To summarize this subsection, we find strong support for H1–H5. We find that CEO pay is negatively correlated to the incidents of fraud, and CEO pay is negatively correlated to the seriousness of fraud. In addition, we find that the institutional context in China influences how fraud is penalized. We find that CEO pay and corporate fraud are more negatively correlated in privately controlled firms, in firms with separate CEO and chair posts, and in firms located in more developed regions. Together, these set of results show that there are nuanced ways in which fraud is penalized in China—although it is clear from the data that there is, in general, a negative relation between compensation and fraud.

Table 5 Fraud determinants—propensity score models

	(1) Fraud	(2) Serious fraud
Audit committee	−0.009* (0.005)	−0.003 (0.003)
Outside directors	−0.003 (0.010)	−0.003 (0.006)
Combine	−0.003 (0.005)	−0.002 (0.003)
Board size	−0.000 (0.001)	−0.001 (0.001)
SOE	−0.008* (0.005)	−0.004 (0.003)
Largest shareholder	−0.000 (0.000)	−0.000 (0.000)
Foreign	0.000 (0.000)	0.000 (0.000)
CEO age	0.001 (0.002)	−0.001 (0.001)
CEO tenure	−0.008 (0.005)	−0.005* (0.003)
Auditor	−0.008*** (0.002)	−0.005*** (0.001)
Log sales	−0.018** (0.008)	−0.004 (0.003)
Return on assets	−0.002 (0.003)	−0.003 (0.002)
Stock returns	−0.003* (0.002)	−0.003** (0.001)
Market to book	0.004 (0.005)	0.003 (0.003)
Volatility	−0.001 (0.001)	−0.001 (0.001)
Regional development	−0.009* (0.005)	−0.003 (0.003)
Industry effects	Yes	Yes
Year effects	Yes	Yes
Observations	4,562	4,562

The dependent variable in column 1 is the fraud indicator variable, which is equal to 1 if a fraud is revealed in a given year and 0 otherwise. In column 2, it is a serious fraud indicator variable = 1 if the fraud was perpetrated for 2 or more years, 0 otherwise. Probit models are estimated using maximum likelihood. Marginal effects are reported with asymptotic robust standard errors in parentheses

*** Significant at 0.01, ** significant at 0.5, * significant at 0.10

CEO Compensation, Political Connection, and Corporate Fraud

In our main analysis, we document a negative and statistically significant association between the log of CEO pay and fraud in privately controlled firms, while not such relationship is identified in the sample of SOEs. An important element of SOEs is that their managers often have strong political connections to the state and the party, under which the government is able to exert significant

[11] The results are not affected by this choice. For example, re-estimation using the logit method yields qualitatively similar results.

[12] It is necessary for this exercise to construct a binary variable from the count variable.

Table 6 Executive compensation and fraud—average treatment effects

	Sample	Treated	Controls	Difference	SE	*t* stat
Model 1: fraud (1/0)						
Log(CEO pay)	Unmatched	12.03	12.55	−0.52	0.07	−7.37
[treated = 146]	ATT	12.04	12.35	−0.31	0.10	−2.85
Model 2: serious fraud						
Log(CEO pay)	Unmatched	11.87	12.53	−0.66	0.09	−6.93
[treated = 80]	ATT	11.90	12.28	−0.38	0.15	−2.57

The dependent variable in model 1 (the fraud equation) is the fraud indicator variable, which is equal to 1 if a fraud is revealed in a given year and 0 otherwise. In model 2, it is a serious fraud indicator variable = 1 if the fraud was perpetrated for 2 or more years, 0 otherwise. ATT is the average treatment effect of the treated. First stage is a probit equation containing all covariates listed in Table 5 to estimate the propensity score

influence on operations of these firms and shield managers from enforcement actions (Fan et al. 2007; Hou and Moore 2010). As a result, the ownership effect may be confounded by the impact of managers' political connections. That is, it is not the ownership per se but political connections of these executives that affect the strength of penalty.[13] To rule out this alternative explanation, we incorporate a proprietary database on CEO political connection to conduct our analysis. This dataset consists of firms in China Securities Index (CSI) 800, a component index that includes large, medium, and small-cap companies listed on the Chinese domestic exchanges. The database includes hand-collected information on CEOs' political connections between 2005 and 2010 using CEO resumes reported on firm websites as well as on Sina-Finance (finance.sina.com.cn). Although our sample size is reduced, this supplementary data nevertheless help us to illustrate the influence of political connections on fraud and compensation penalty.

Consistent with Fan et al. (2007), we measure CEO political connection using a dummy variable which is equal to one when the CEO has held a position in central government, local government, or military before joining the firm, and zero otherwise. We implement fixed-effects models similar to those in Table 3 to conduct our estimations and report results in Table 7. Columns 1 and 2 include CEO political connection as an additional control variable to test H1 and H2, respectively. We then split the sample to two subsamples by contrasting CEOs with political connections and those without in columns 3 and 4 of Table 7.

We document a significant negative association between CEO compensation and corporate fraud as well as between CEO compensation and seriousness of fraud after controlling for the influence of CEO political connection. Our main hypotheses are again confirmed. In addition, our split-sample test suggests that there is a significant negative correlation between log CEO pay and fraud for CEOs without political connection (coefficient estimate = −0.346), while such correlation is insignificant in the subsample of CEOs with political connections. These results suggest that it is not only state ownership but also CEO political connections affect the effectiveness of enforcement actions and vigilance of board monitoring.

CEO Turnover and Corporate Fraud

The primary goal of our paper is to investigate whether CEO compensation is sensitive to corporate fraud. However, prior research has shown that firms that commit fraud are also more likely to fire their CEOs (Chen et al. 2005; Firth et al. 2011). Although not the central focus of our paper, we also test this hypothesis. Specifically, we test whether CEO turnover is negatively correlated to corporate fraud and whether such relationship is also contingent on ownership structure, internal governance mechanism, and regional development. To do so, we estimate a standard probit model where the outcome variable is equal to 1 if the CEO is replaced in a given year and 0 otherwise. We introduce a set of covariates that have been found to be important in the prior literature, such as board and ownership structure, CEO and firm characteristics (e.g., Chen et al. 2005; Firth et al. 2011). We lag all independent and control variables for 1 year to help build causality.

Table 8 reports marginal effects based on the coefficients. Column 1 shows that CEOs of fraud firms are about 11 % more likely to be terminated compared to those who do not, after controlling for a set of determinants of CEO turnover. Our results are consistent with findings of Chen et al. (2005) and Firth et al. (2011). We then investigate whether the correlation between CEO turnover and corporate fraud is contingent upon ownership and board structure as well as regional development using the similar subsample split applied in the earlier CEO compensation models. Columns 2 and 3 show that there is no correlation between CEO turnover and corporate fraud when the State is the ultimate owner, while a significantly negative correlation is identified in privately controlled firms. Columns

[13] We would like to thank an anonymous reviewer for this suggestion.

Table 7 CEO compensation, political connection, and fraud in China

	(1) Log CEO pay Fixed effects	(2) Log CEO pay	(3) Log CEO pay Fixed effects	(4) Log CEO pay
	Full sample	Full sample	CEOs with connection	CEOs without connection
Fraud [H1]	−0.292*** (0.107)		−0.055 (0.115)	−0.347*** (0.131)
Serious fraud [H2]		−0.097** (0.040)		
Political connection	−0.172* (0.098)	−0.170* (0.098)	–	–
Comp. Comm.	0.108** (0.048)	0.109** (0.049)	0.098 (0.137)	0.087* (0.049)
Outside directors	−0.027 (0.102)	−0.027 (0.101)	−0.233* (0.118)	0.033 (0.133)
Combine	0.256*** (0.085)	0.254*** (0.085)	0.535*** (0.198)	0.238** (0.101)
Board size	0.026 (0.020)	0.026 (0.020)	0.029 (0.036)	0.024 (0.022)
SOE	−0.013 (0.045)	−0.014 (0.045)	−0.126 (0.097)	0.002 (0.041)
Largest shareholder	0.003 (0.003)	0.003 (0.003)	−0.008* (0.004)	0.005 (0.003)
Foreign	−0.119 (0.079)	−0.119 (0.078)	−0.095 (0.136)	−0.091 (0.110)
Auditor	−0.036 (0.067)	−0.033 (0.067)	−0.111 (0.165)	−0.059 (0.066)
Log sales	0.140*** (0.035)	0.138*** (0.035)	0.107 (0.108)	0.108*** (0.033)
Return on assets	0.430 (0.330)	0.440 (0.334)	−0.044 (0.116)	1.935*** (0.603)
Stock returns	−0.002 (0.015)	−0.002 (0.015)	−0.023 (0.035)	0.005 (0.017)
Market to book	0.019 (0.015)	0.019 (0.015)	0.049* (0.029)	−0.000 (0.017)
Volatility	0.106 (0.084)	0.104 (0.084)	−0.160*** (0.041)	0.078 (0.094)
Regional development	−0.051 (0.037)	−0.054 (0.037)	0.131 (0.125)	−0.077** (0.036)
Constant	10.105*** (0.949)	10.167*** (0.949)	9.429*** (2.466)	10.879*** (0.919)
Year effects	Yes	Yes	Yes	Yes
Observations	1,869	1,869	358	1,511
Number of firms	527	527	117	410
R^2	0.428	0.426	0.376	0.465

The dependent variable is the log of CEO pay. Fraud = 1 if the fraud is revealed in a given year, and 0 otherwise. Political connection = 1 if the CEO has worked for central government, local government, or military before joining the firm. *Serious fraud* number of years over which the fraud was perpetrated. Other variables are defined in Appendix

*** Significant at 0.01, ** significant at 0.5, * significant at 0.10

4 and 5 suggest that firms who separate the posts of CEO and chairman are more likely to fire the CEO for committing fraud, while in the sample firms that combine the posts of CEO and chairman, there is no connection between CEO turnover and corporate fraud. Finally, columns 6 and 7 indicate that firms whose headquarters are located in developed regions are more likely to fire their CEOs for committing fraud, while there is no evidence that those in underdeveloped regions are doing so. Overall, these results are consistent with our predictions in H3 to H5, i.e., ownership structure, internal control, and regional development all affect the effectiveness of firms in disciplining their CEOs for committing fraud.

CEO Appointment Time and Fraud

Our main empirical findings have shown that CEO compensation is negatively correlated to company fraud. However, we identify our event year as the year when a fraud is revealed and an enforcement action is imposed on the firm. A potential problem of this identification is that the detected fraud may occur before the current CEO's appointment. Intuitively, the current CEO shall not be held responsible and receive penalty for such a fraud. In contrast, when a detected fraud occurred during the CEO's tenure, the CEO is more likely to take the blame and bear consequence for it. To better distinguish these two types of fraud, we classify fraud events identified in our main analysis into two types: Type 1 indicates the fraud affects financial years after the CEO's appointment, and Type 2 indicates the fraud only affects financial years before the CEO's appointment. Such classification is realized by comparing the CEO's starting year in the post with the fraud's affected years. Both variables are reported by CSMAR. Within our sample periods, a total of 146 frauds occurred during the current CEO's tenure, and the rest 118 frauds occurred before the current CEO was appointed. We next create two dummy variables (Fraud_Type1 and

Table 8 CEO turnover and fraud in China

	(1) All	(2) SOE	(3) Private	(4) Combine	(5) Separate	(6) Developed	(7) Underdeveloped
Fraud	0.110*** (0.033)	0.066 (0.053)	0.131*** (0.042)	0.106 (0.062)	0.102*** (0.039)	0.135*** (0.040)	0.048 (0.062)
Comp. Comm.	−0.022* (0.012)	−0.028 (0.017)	−0.016 (0.017)	−0.012 (0.023)	−0.024* (0.014)	−0.021 (0.014)	−0.037 (0.027)
Outside directors	−0.005 (0.024)	0.003 (0.030)	−0.017 (0.040)	−0.048 (0.057)	0.003 (0.027)	−0.011 (0.031)	0.028 (0.039)
Combine	−0.045*** (0.013)	−0.014 (0.023)	−0.064*** (0.017)	–	–	−0.040*** (0.015)	−0.063** (0.028)
Board size	−0.004 (0.003)	0.001 (0.004)	−0.009** (0.004)	0.002 (0.005)	−0.006* (0.003)	−0.002 (0.003)	−0.009 (0.006)
SOE	−0.012 (0.012)	–	–	−0.017 (0.024)	−0.018 (0.014)	−0.005 (0.014)	−0.035 (0.027)
Largest shareholder	0.000 (0.000)	0.000 (0.001)	0.000 (0.001)	−0.001 (0.001)	0.000 (0.000)	0.000 (0.000)	0.000 (0.001)
Foreign	0.026 (0.043)	0.123 (0.263)	0.034 (0.045)	0.106 (0.086)	0.013 (0.049)	0.006 (0.045)	0.116 (0.110)
CEO age	0.003*** (0.001)	0.005*** (0.001)	0.003** (0.001)	−0.005*** (0.002)	0.006*** (0.001)	0.003*** (0.001)	0.006*** (0.002)
CEO tenure	0.038*** (0.005)	0.043*** (0.007)	0.037*** (0.007)	0.010 (0.011)	0.043*** (0.006)	0.034*** (0.006)	0.049*** (0.010)
Auditor	0.014 (0.014)	0.037* (0.021)	−0.010 (0.019)	−0.004 (0.029)	0.020 (0.016)	0.027* (0.015)	−0.050 (0.031)
Log sales	−0.015*** (0.005)	−0.006 (0.007)	−0.020*** (0.006)	−0.023*** (0.008)	−0.012** (0.005)	−0.020*** (0.005)	0.002 (0.010)
Return on assets	−0.093*** (0.030)	−0.331*** (0.088)	−0.058* (0.031)	−0.025 (0.040)	−0.116*** (0.041)	−0.061** (0.029)	−0.387*** (0.097)
Stock returns	0.006 (0.007)	0.008 (0.011)	0.002 (0.010)	0.027* (0.014)	0.001 (0.009)	0.001 (0.009)	0.012 (0.015)
Market to book	−0.009** (0.004)	−0.004 (0.007)	−0.010* (0.005)	−0.016* (0.009)	−0.005 (0.005)	−0.013*** (0.005)	0.012 (0.009)
Volatility	0.009 (0.018)	0.045 (0.033)	−0.020 (0.020)	0.019 (0.043)	0.002 (0.020)	0.017 (0.020)	−0.018 (0.039)
Regional development	−0.006** (0.003)	−0.005 (0.004)	−0.007* (0.004)	−0.006 (0.006)	−0.007** (0.003)	–	–
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,662	2,692	2,960	1,037	4,609	4,183	1,479
Pseudo R^2	0.034	0.043	0.043	0.092	0.041	0.035	0.057

The dependent variable is the CEO Turnover (1/0) indicator variable. Other variables are defined in Appendix. Probit models are estimated using maximum likelihood. Marginal effects are reported with asymptotic robust standard errors in parentheses

*** Significant at 0.01, ** significant at 0.5, * significant at 0.10

Fraud_Type2) to represent these two types of fraud events. We replace our main fraud dummy variable in Table 3 with these two separate fraud variables. In our non-tabulated results, we find that the relationship between Type1_fraud and CEO compensation is statistically significant, with coefficient being −0.288 (SE = 0.082) in the OLS model and −0.094 (SE = 0.053) in the fixed-effects model. In contrast, no statistical significant relationship is identified between Type2_fraud and CEO pay, with coefficient being −0.047 (SE = 0.093) in the OLS model and −0.019 (SE = 0.063) in the fixed-effects model. These results suggest that CEOs receive compensation penalty only in case of type 1 fraud, i.e., fraud occurs during their tenure, but not for type 2 fraud, those beyond their control. Overall, our results provide further supports to our main argument, i.e., boards use compensation reduction to penalize Chinese CEOs for committing fraud and such penalty is targeted at those CEOs responsible for the fraud.

Alternative Measures of Serious Fraud

Our main empirical findings also suggest that a more severe fraud is associated with larger CEO compensation penalty. The measure of 'serious fraud' that we use in the main test is the total number of years a fraud affected. To mitigate the influence of our measure on empirical results, we use three alternative measures to capture this construct. First, we define serious fraud according to whether the

fraud is prosecuted by the CSRC or domestic exchanges. Ding et al. (2010) and Jia et al. (2009) suggest that a fraud is considered more serious when it is prosecuted by the CSRC because the CSRC has more weight than domestic exchange enforcement. Our second measure is built on the number of violations by defining serious fraud as a dummy variable indicating whether the fraud involves multiple violations. Finally, we identify the fraud as serious if it is related to more severe types classified by Chen et al. (2011b), namely disclosing false financial information, misleading statements, price manipulations, illegal provisions, and insider trading. It is 0 otherwise. We then test our main models using these alternative measures of serious fraud and report our results in Table 9. Similar to the structure in Table 3, we examine the impact of serious fraud on CEO pay using continuing CEOs and excluding firm years with CEO turnovers.

The results in Table 9 show a clear and consistent picture. In general, there is a negative correlation between CEO compensation and the seriousness of fraud. We find that CEO pay is more negatively correlated to fraud when the fraud is prosecuted by the CSRC. We also find that CEO pay is more negatively correlated to fraud when the fraud involves multiple violations. Finally, we find that although the correlation between the type of violation and CEO pay is negative it is not significant. Taken as a whole, though, these additional sensitivity tests seem to confirm our principal findings that CEO pay and corporate fraud are negatively correlated in China.

CEO Total Compensation and Fraud

Next, we consider the measurement of our dependent variable. We estimate CEO compensation using reported CEO total cash pay in our main analysis. Our results suggest that CEO cash pay is negatively associated with company fraud and the seriousness of the fraud. However, CEOs may also receive equity incentives. As a result, the level of CEO total compensation may be higher than CEO cash compensation. We thereby calculate CEO total compensation as the sum of CEO cash pay plus the value of CEO equity incentives. Due to a primitive disclosure system, Chinese public firms are not required to disclose option exercise price or fair market value of equity incentives. As a result, we have to rely on the announcement date stock price to estimate values of equity incentives. We rely on the following three methods to conduct our estimations. First, we assume the grant price is the opening price of the announcement date or the opening price of the last trading day before the announcement if the announcement day is a weekend or a non-trading day. Second, we assume the grant price is the opening price of the announcement month. Third, we exclude all firms

Table 9 CEO compensation and fraud in China: alternative measures of serious fraud

	(1) Log CEO pay Fixed effects	(2) Log CEO pay Fixed effects	(3) Log CEO pay Fixed effects
Serious fraud: CSRC is prosecutor	−0.119* (0.065)		
Serious fraud: multiple violations		−0.129** (0.056)	
Serious fraud: severe violation			−0.019 (0.052)
Comp. Committee	0.056** (0.029)	0.056* (0.029)	0.057** (0.029)
Outside directors	0.034 (0.059)	0.034 (0.059)	0.034 (0.059)
Combine	0.156*** (0.051)	0.157*** (0.051)	0.155*** (0.051)
Board size	0.014 (0.012)	0.014 (0.012)	0.014 (0.012)
SOE	−0.057* (0.029)	−0.058* (0.029)	−0.057* (0.029)
Largest shareholder	−0.001 (0.002)	−0.001 (0.002)	−0.001 (0.002)
Foreign	−0.064 (0.083)	−0.059 (0.083)	−0.063 (0.083)
Auditor	−0.016 (0.038)	−0.017 (0.038)	−0.016 (0.038)
Log sales	0.157*** (0.023)	0.157*** (0.023)	0.157*** (0.023)
Return on assets	0.209** (0.090)	0.213** (0.091)	0.205** (0.089)
Stock returns	−0.010 (0.010)	−0.010 (0.010)	−0.011 (0.010)
Market to book	0.012 (0.009)	0.012 (0.009)	0.013 (0.009)
Volatility	0.044 (0.062)	0.043 (0.062)	0.046 (0.061)
Regional development	−0.065*** (0.025)	−0.065*** (0.025)	−0.065*** (0.025)
Constant	9.995*** (0.588)	9.994*** (0.588)	9.998*** (0.589)
Year effects	Yes	Yes	Yes
Observations	5,061	5,061	5,061
R^2	0.357	0.357	0.356
Number of firms	1,471	1,471	1,471

The dependent variable in column 1 is a serious fraud indicator variable by type of prosecutors = 1 if the fraud is prosecuted by the CSRC or Finance Department, 0 otherwise. The dependent variable in column 2 is a serious fraud indicator variable by violation types = 1 if the fraud involves more than one violations, 0 otherwise. The dependent variable in column 3 is a serious fraud indicator variable by violation types = 1 if the fraud is related to false financial information, misleading statements, price manipulation, illegal provisions, and insider trading, 0 otherwise. Robust standard errors are reported in parentheses

*** Significant at 0.01, ** significant at 0.5, * significant at 0.10

issuing equity incentives to CEOs from our sample. We calculate the value of stock option grants by multiplying the grant number to the estimated grant price and then divided by three. We calculate the value of restricted stock grants by multiplying the grant number to the estimated grant price. We then sum up multiple grants within a year to calculate the total value of equity incentives to a given CEO in a year. Finally, we add the estimated value of equity incentives to cash compensation to measure CEO total compensation.

We report our results in Table 10. We again apply the fixed-effects methods. The estimated models contain a full set of control variables akin to those identified in Table 3. Columns 1, 2, and 3 test the relationship between CEO total compensation and fraud, and columns 4, 5, and 6 test the association between CEO total compensation and the seriousness of fraud. Total compensation is calculated based on the announcement date price in columns 1 and 4, and calculated based on the announcement month price in columns 2 and 5. Columns 3 and 6 exclude all firm years when there is a CEO incentive grant, and report results when CEO cash compensation is equal to CEO total compensation.

Table 10 confirms both hypotheses 1 and 2. First of all, there is a significant negative correlation between CEO total compensation and fraud. CEOs whose firms are caught of committing fraud are associated with 8.7–9.3 % lower total compensation than their counterpart CEOs in non-fraud firms. Table 10 also indicates that the seriousness of fraud is negatively associated with CEO total compensation. The coefficients on our serious fraud variable range from −0.048 to −0.051, all are statistically significant at 0.05 or 0.01 level.

Average Executive Compensation and Fraud

We use data on individual CEO compensation from 2005 onward to conduct our main analysis, when individual CEO pay data are available. However, we also have data stretching back to year 2000 when the average compensation of the top three executives is provided. Previous research has used this alternative compensation measure when investigating executive compensation in China (Firth et al. 2006a, 2007; Kato and Long 2006a). We then replicate our basic models using this average executive compensation measure. The estimated models contain a full set of control variables akin to those identified in Table 3. The extended data consist of 14,625 firm years from year 2000 to year 2010 and cover 2,064 unique Chinese publicly traded firms. In the fixed-effects models, we find that there is a negative correlation between the log of average executive compensation and the detection of a company fraud (coefficient estimate = −0.057, standard error = 0.027) and between executive compensation and serious fraud (coefficient estimate = −0.029, standard error = 0.011).[14] These results suggest that not only the CEO but also an average top executive may suffer from a pay cut as a result of corporate fraud.

Chairperson Compensation and Fraud

Firth et al. (2006a, b) indicate that the chairperson of the board of directors in China is the legal representative of the firm who works full time for the company, thus it is also a top executive position that ranks even above the general manager, identified as the CEO in our main analysis. We then conduct another additional analysis to estimate whether cash compensation of the chairperson is also affected by corporate fraud. We replicate both OLS and fixed-effect models in Table 3 by replacing the dependent variables with the logarithm of chairperson's cash compensation. We find there is a significantly negative correlation between the log of chairperson pay and the detection of a company fraud (coefficient estimate = −0.165, standard error = 0.091) and between chairperson pay and serious fraud (coefficient estimate = −0.070, standard error = 0.038) in the OLS regression. We also find that although there is a negative correlation between the log of chairperson compensation and fraud as well as between log chairperson compensation and serious fraud, the coefficients are not significant at the conventional level in the fixed-effect model. Overall, these results provide modest support to our main hypotheses.

Finally, we also experiment with alternative estimation strategies to isolate the relationship between CEO pay and company fraud. Specifically, we estimate a difference in difference pay equation following Cheng and Farber (2008). We find that the growth in executive pay is approximately 10.1 % lower in firms committing fraud compared to those firms that did not commit fraud (coefficient estimate = −0.109, standard error = 0.036). Overall, this additional evidence suggests that CEOs are penalized for fraud by receiving lower compensation growth.

Discussion and Conclusion

This study investigates the connection between executive compensation and corporate fraud in China. Our central research question concerns whether Chinese CEOs receive lower compensation if fraud is detected in their firms. In general, the answer is 'yes.' Our results are established

[14] We also find this set of qualitative results held for the OLS estimates and propensity score estimates as well.

Table 10 CEO total compensation and fraud in China

	Log CEO total pay (fixed effects)			Log CEO total pay (fixed effects)		
	(1) Estimated total pay 1	(2) Estimated total pay 2	(3) Excluding firms with incentives	(4) Estimated total pay 1	(5) Estimated total pay 2	(6) Excluding firms with incentives
Fraud [H1]	−0.093* (0.051)	−0.094* (0.051)	−0.087* (0.045)			
Serious fraud [H2]				−0.048** (0.019)	−0.048** (0.019)	−0.051*** (0.017)
Comp. Committee	0.060* (0.036)	0.058 (0.036)	0.050* (0.027)	0.064* (0.038)	0.062 (0.038)	0.056* (0.029)
Outside directors	0.026 (0.062)	0.026 (0.062)	0.041 (0.059)	0.026 (0.062)	0.027 (0.062)	0.040 (0.059)
Combine	0.223*** (0.072)	0.224*** (0.073)	0.154*** (0.051)	0.228*** (0.074)	0.229*** (0.075)	0.152*** (0.052)
Board Size	0.020 (0.013)	0.020 (0.013)	0.015 (0.012)	0.018 (0.013)	0.018 (0.013)	0.014 (0.012)
SOE	−0.005 (0.034)	−0.004 (0.034)	−0.056* (0.029)	−0.012 (0.035)	−0.011 (0.035)	−0.061** (0.030)
Largest Shareholder	−0.002 (0.002)	−0.002 (0.002)	−0.002 (0.002)	−0.002 (0.002)	−0.002 (0.002)	−0.002 (0.002)
Foreign	−0.118 (0.124)	−0.117 (0.124)	−0.045 (0.090)	−0.140 (0.102)	−0.139 (0.102)	−0.085 (0.077)
Auditor	−0.033 (0.039)	−0.034 (0.039)	−0.011 (0.036)	−0.030 (0.040)	−0.031 (0.040)	−0.009 (0.038)
Log Sales	0.187*** (0.026)	0.188*** (0.026)	0.157*** (0.023)	0.186*** (0.027)	0.186*** (0.027)	0.157*** (0.024)
Return on Assets	0.195** (0.091)	0.195** (0.091)	0.202** (0.088)	0.209** (0.094)	0.209** (0.095)	0.214** (0.091)
Stock Returns	0.007 (0.013)	0.007 (0.013)	−0.013 (0.010)	0.008 (0.014)	0.008 (0.014)	−0.012 (0.011)
Market to Book	0.016 (0.012)	0.016 (0.012)	0.015* (0.009)	0.015 (0.013)	0.015 (0.013)	0.013 (0.009)
Volatility	0.067 (0.064)	0.066 (0.064)	0.053 (0.060)	0.056 (0.066)	0.055 (0.066)	0.043 (0.062)
Regional development	−0.036 (0.033)	−0.036 (0.033)	−0.062** (0.025)	−0.038 (0.033)	−0.038 (0.033)	−0.064** (0.025)
Constant	9.077*** (0.708)	9.075*** (0.706)	9.950*** (0.581)	9.146*** (0.724)	9.145*** (0.722)	9.982*** (0.593)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,492	5,492	5,403	5,061	5,061	4,975
R^2	0.267	0.268	0.345	0.270	0.271	0.354

The dependent variable is the log of CEO total pay estimated using different methods as described in the text. Fraud = 1 if a fraud is revealed in a given year, and 0 otherwise. Other variables are defined in Appendix

*** Significant at 0.01, ** significant at 0.5, * significant at 0.10

through a comprehensive fraud dataset covering nearly all publicly traded Chinese firms between 2005 and 2010.

We first document a significantly negative correlation between Chinese executive compensation and corporate fraud. Our findings are consistent with the hypothesis that executives are penalized for fraud by receiving lower pay. This finding is established using panel data fixed effects and propensity score methods. Sensitivity checks show that the negative association between executive pay and fraud could also be established when CEO pay is measured using total compensation instead of cash pay. Such a negative relationship is stronger when the fraud occurred during the current CEO's tenure. We also find that the magnitude of the compensation penalty is associated with seriousness of fraud. CEOs in firms with financial fraud pertaining to multiple years, being prosecuted by CSRC, or experiencing multiple violations, are all associated with an even larger compensation penalty. The evidence presented in the paper suggests that Chinese executives suffer financial penalties after enforcement actions. This financial penalty is independent of labor market penalty identified in prior literature and confirmed in our paper, i.e., executives in these firms are more likely to be replaced.

Our results also suggest that ownership structure, internal governance mechanism, regional development, and CEO political connections all significantly influent effectiveness of the board in disciplining executives for committing fraud. We find that privately controlled firms, those that separate the posts of CEO and chairperson, those located in developed regions, and those without political connections are more likely to have reduced CEO compensation as a result of enforcement action, consistent with the hypothesis that corporate governance mechanisms affect effectiveness and strength of disciplinary actions for wrongdoings. These results are also manifested in the CEO labor market. We find the likelihood of CEO turnover for corporate fraud is greater in privately controlled firms, firms that separate the posts of CEO and chairperson, and firms located in more economically developed regions.

Our study also opens up some new and potentially fruitful research avenues. First, the relatively nascent executive compensation disclosure arrangements in China

prevent us from distinguishing between different components of executive compensation. The recent accounting and management literature using the U.S. data (e.g., Harris and Bromiley 2007; O'Connor Jr. et al. 2006; Zhang et al. 2008) has shown that equity incentives play an important role in preventing or inducing financial fraud. There are also studies investigating how corporations adjust their executive equity incentive compensation package as a remedy to financial fraud and better align executive interests with those of shareholders (Cheng and Farber 2008). With the CSRC demanding more detailed disclosure in executive compensation, particularly the usage of equity incentives in China, it provides opportunities for future research to further explore the linkages between executive equity incentives and corporate fraud.

Although we examine the empirical relation between fraud and executive compensation, we do not investigate motivations of the board and shareholders in imposing compensation penalties, and our results should be seen in this light. We implicitly assume that the CEO compensation discount arises from regulatory enforcement actions and executives are disciplined for their wrongdoing. However, it may arise from other confounding factors. For example, listed SOEs typically have close political connections with the government (Fan et al. 2007). It may be the case that fraud signals inferior management or board quality and results in a loss of crucial political connections for these firms. As a result, boards or shareholders reduce executive compensation to penalize executives for such a loss. That is, a firm's political connection may have both direct and indirect effects on changes in executive compensation.[15] We have incorporated a preliminary test of the impact of political connection on compensation penalty related to corporate fraud. Future research could undoubtedly benefit from more in-depth exploration of such mediators.

Finally, the problem of corporate fraud is not just a matter of compliance of various law and governance regulations but is an important ethical issue (Kaplan 2001; Staubus 2005). Archival data used in our analysis are unable to capture ethical judgment of individual board members, audit committee members, and managers. Future research could follow such works as Kaplan (2001), Elias (2002), Almer et al. (2008) by utilizing a survey method to collect detailed information on ethical judgment of board members and management teams, which could help advance our understandings on motivations of these key organizational decision-makers.

Overall, our paper provides the first evidence on the impact of corporate fraud on executive compensation in Chinese listed firms. We document that fraud does bring negative financial consequences for Chinese CEOs. We also identify the moderating role of ownership structure, internal governance mechanism, and regional development on such a relationship. We hope that our findings will stimulate further research on the effectiveness of Chinese corporate governance system and executive compensation in preventing corporate fraud and protecting shareholder value.

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Appendix: Variable Definitions

Log (CEO pay)	=	Logarithm of CEO compensation, which is calculated as the total of salary, bonus, and other cash compensation as reported by the firm
Fraud	=	1 if fraud is revealed in a given year, and zero otherwise
Serious fraud	=	The number of years the fraud was perpetrated
Serious fraud: CSRC is prosecutor	=	1 if the fraud is prosecuted by the CSRC or Finance Department, and zero otherwise
Serious fraud: multiple violations	=	1 if the fraud involves more than one violations, and zero otherwise
Serious fraud: severe violation	=	1 if the fraud is related to false financial information, misleading statements, price manipulation, illegal provisions, and insider trading, and zero otherwise
Comp. Comm.	=	1 if there is a compensation committee, and zero otherwise.
Audit Comm.	=	1 if there is an audit committee, and zero otherwise
Combine	=	1 if the CEO also holds the chairperson position, and zero otherwise
Board size	=	The number of directors on a board
Outside directors	=	1 if the proportion of outside directors on the board is more than one-third, and zero otherwise
SOE	=	1 if the ultimate owner of the firm is state, and zero otherwise.
Largest shareholder	=	Percentage ownership of the single largest shareholder
Foreign	=	1 if the ultimate owner is a foreign entity, and zero otherwise

[15] We would like to thank a referee for suggesting this point.

Auditor	=	1 if the auditor is one of the top 8 largest auditors ranked by total assets, and zero otherwise.
Log sales	=	Logarithm of total firm sales
ROA	=	Return on assets ratio measured as earnings before interest and tax divided by total assets.
Stock returns	=	Annualized stock returns calculated from monthly returns data
Market to book	=	Market value of the firm divided by total assets
Volatility	=	Past 3 years stock returns volatility calculated as rolling average
Regional development	=	NERI marketization index of the province where a firm's headquarter locates
Industry	=	Based on 22 CSRC classification of industries: Agriculture and fishery; Mining; Manufacturing-food/beverage; Manufacturing-Textiles; Manufacturing-Furniture; Manufacturing-Paper/Printing; Manufacturing-Petroleum; Manufacturing-Electronic; Manufacturing- Metal/Non-metal; Manufacturing-Machines; Manufacturing-Pharmaceutical; Manufacturing-others; Electricity, water and other energy manufacturing and supply; Construction; Transportation and logistics; Information technology; Wholesales and retails; Finance and insurance; Real estate; Service; Communication; Others

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