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Jerry Cao

Singapore Management University

Xiaofei Pan

University of Wollongong, xpan@uow.edu.au

Gary G. Tian

University of Wollongong, gtian@uow.edu.au

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Keywords

Disproportional, ownership, structure, pay, performance, relationship, evidence, from, China, listed, firms

Disciplines

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Disproportional ownership structure and pay-performance relationship: evidence from China's listed firms

Jerry Cao,^a Xiaofei Pan,^b Gary Tian^c

^a Lee Kong Chian School of Business, Singapore Management University

^b and ^c School of Accounting and Finance, University of Wollongong, Australia

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Abstract

This paper examines the impact of disproportional ownership structure on the pay-performance relationship in China's listed firms. We find that the cash flow rights of the ultimate controlling shareholder have a positive effect on this relationship while a divergence between the control rights and cash flow rights has a significantly negative effect. By dividing our sample into state owned enterprises (SOE), state assets management bureaus (SAMB), and privately controlled firms, we find that cash flow rights in SOE controlled firms have a significant impact on accounting based pay performance and cash flow rights in privately controlled firms also affect the market performance based relationship, however, CEO pay in SAMB controlled firms bear no relationship with either accounting or market based performance. We therefore argue that CEO pay is inefficient in firms where the state is the controlling shareholder because it does not maximize shareholder's market value but is consistent with the efforts of controlling shareholders to maximize their cash flow.

JEL Classifications: G32; G34

Keywords: Managerial compensation, Firm performance, Ownership structure

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1. Introduction

In recent years two strands of research on the effect that ownership structure has on pay-performance relationship has begun to emerge. The first focused on the effects of cash flow rights and excess control rights on CEO pay (Masulis et al., 2009; Barontini and Bozzi, 2010). With US dual-class firms Masulis et al. (2009) found that the divergence of insider control-cash flow rights had a positive effect on CEO pay, while from a sample of Italian listed firms, Barontini and Bozzi (2010) acknowledged that there was a negative effect. The second focused the effects of different types of ultimate shareholders, particularly between state and non-state owned firms in a transition economy (Ke et al., 1999; Kato and Long, 2005; Firth et al., 2006). They all found that the pay-performance relationship was significantly different across firms with alternative styles of controlling shareholders, and proved that it was determined by them.

Extant research on the effects that separation of ownership and control has on firm performance and value is well established (Cleassens et al., 2002; Lemmon and Lins, 2003; Laeven and Levine, 2008; Masulis et al., 2009; Gompers et al., 2010). Indeed it is common practice to have concentrated ownership and dominant shareholders in modern publicly traded companies where the largest shareholders exercise control through their voting rights despite having relatively small amounts of cash flow rights. The divergence between control rights and cash flow rights (excess control rights) renders them the ability and incentive to expropriate the wealth of other investors in pursuit of own interests, which are often diametrically opposed to those of minority investors. Therefore, while the largest shareholder can mitigate agency conflict between shareholders and managers, it leaves the agency conflict between largest shareholders and minority shareholders as primarily agency problem. This problem

becomes particularly severe in transition economies where ownership is concentrated and investors lack legal protection (Shleifer and Vishny, 1997; Lin et al., 2010).

There was no evidence that the separation of control and cash flow rights affected the pay-performance relationship, which is important for corporate governance because in an economy with concentrated ownership, the largest shareholders have strong incentives to directly monitor managers by relating CEO pay to firm performance (Murphy, 1999). Nevertheless, the largest shareholders will also maintain their private benefits by having CEO pay schemes unrelated to the wealth of minority shareholders. In this paper we examine the effect that ownership structure, specifically the cash flow rights and control rights of the largest shareholders, has on the pay-performance relationship in China's listed firms.

One key feature of these firms is that many of them are state owned enterprises (SOEs) carved out of former state controlled firms¹. In these SOEs, controlling shareholders own substantial control rights in excess of their cash flow rights through a long principal-agent chain, a significant pyramid structure, and cross-shareholdings of ownership. Guided by the reform and privatization process, the state relinquished controls over some SOEs by either selling the shares to the public or allowing takeovers. Along with the IPOs of privately controlled firms since 2001, publicly trading SOEs have evolved into an important component of China's listed firms. Since state controlled and non-state controlled firms have different operating objectives due to the nature of their ownership (e.g. they are subject to different regulations), this has had different results on the pay-performance relationship between them. Therefore, the Chinese context provides an excellent laboratory for us to examine and explain the effects of ownership structure, particularly the divergence between control rights and cash flow rights on the pay-performance relationship.

Within state-controlled firms the controlling shareholders actually belong to different state owned entities and government agents, which means that each group uses a performance-based pay scheme that best suits their objectives. It was argued that these state controlled firms operate with multiple objectives that varied between

¹ Privately controlled listed firms have only existed in China since 2001.

maximizing the wealth of shareholders, maintaining urban employment levels, and controlling sensitive industries (Clarke, 2003). This study only covers the early years of economic reform in China. To gain a clearer understanding of this issue, we classified state controlled firms into two types of ownership based on ultimate controlling shareholders, i.e., state assets management bureaus (SAMBs), and state owned enterprises (SOEs). On the one hand, SAMB is a government agency charged with managing and controlling state owned assets where CEOs work as representatives of the government, so their pay scheme may not be based on performance. On the other hand, one reason for the existence of publicly listed SOEs is to transform them into modern market oriented firms to maximize profitability.

In 1985, China introduced market oriented wage reform along with other economic reforms in state controlled firms where general managers worked as bureaucrats and were paid according to the civil service pay scale. In 1985, the Ministry of Labor announced that CEO payment in SOEs should be linked to firm economic performance (the Ministry of Labor, 2000). However, this scheme did not provide sufficient incentive because these SOEs were still under the previous system where profits and wages were redistributed by the state (Yueh, 2004). With the establishment of two stock exchanges in the early 1990s and the State-Owned Assets Supervision and Administration Commission of the State Council (SASAC) in 2003, the SOEs were restructured and listed on the two stock exchanges. Since 2003, many regulations have been promulgated by SASAC to evaluate SOEs and any existing link between their performance and CEO pay. Specifically, SASAC issued 'Interim regulations on the evaluation of the top executive operating performance' in SOEs affiliated to the central government (SOECGs) in 2003, which clearly stated that top executive pay should be related to total profits and sales (SASAC, 2003). Later in 2006 and 2010 respectively, SASAC updated this regulation in those firms where total profits and sales are still used to measure performance (SASAC, 2006a, 2010)²,

² Furthermore, in 2007 and 2008, the SASAC announced two 'supplementary provisions' of this regulation which made further efforts on relating executive pay to firm performance in SOEs (SASAC, 2007, 2008). Meanwhile, in 2004, 2006 and 2009, the SASAC also promulgated the 'Interim regulations on the administration of top executive pay in SOECGs', 'Interim regulations on the evaluation and administration of SOECG performance' and 'Interim regulations on the evaluation and administration of state owned financial institutions firm performance' (SASAC,

by describing how to evaluate executive performance, and including a requirement that a CEO should resign if they fail to perform. Obviously, by putting these regulations into practice, SASAC has decreed that profitability be the primary measure of firm performance, and CEO pay is to be linked to it (SASAC, 2004, 2006b). Meanwhile, to curtail CEO's from expropriating shareholder wealth through excessive perks, SASAC also promulgated 'Instructions on regulating top executive 'on-job' consumptions in SOECGs' in 2006 (SASAC, 2006c)³.

These reforms and regulations of executive compensation in SOE's are largely aimed at aligning the interests of shareholders and management. Extant literature found a positive pay-performance relationship in both SOE and privately controlled firms but not in SAMB controlled firms (Kato and Long, 2005; Firth et al., 2006, 2007). These results confirmed that the goals of these reforms in SOEs and CEO compensation have only been achieved to some extent.

In China's weak corporate governance environment with its lack of legal protection for investors, the largest shareholders are facing strong incentives to monitor managers and operations if they are to retain their substantial cash flow rights. However, if their control rights exceed their cash flow rights they are likely to pursue their own interests and may seek to expropriate other investors by tunneling, related party sales, and transferring profits out of the company (Johnson et al., 2000). Therefore, the largest shareholders' cash flow rights and excess control rights may have different effects on the pay-performance relationship. Our first hypotheses states that:

- *H1a: Cash flow rights have a positive effect on pay-performance relationship.*
- *H1b: Excess control rights have a negative effect on pay-performance relationship.*

One important characteristic of China's listed firms is that the majority of

2004, 2006b, 2009).

³ At the local levels, the local SASACs located across the country have also issued regulations based on their local specific characteristics according to the regulations from the central SASAC. For example, Beijing SASAC promulgated 'Interim regulations on the administration of top executive pay in Beijing SOEs' in 2004, which has the same effects of relating CEO pay to firm performance (Beijing SASAC, 2004).

controlling shareholders are state-owned entities or government agents, and the shares they hold are not tradeable⁵ on the stock exchanges. As a result, these shareholders have an incentive to set CEO pay based on accounting-linked performance indicators which gives them an opportunity to expropriate other investors with more resources, instead of market based indicators which tend to link CEO pay with maximizing their wealth. Accordingly, we argue that state shareholders emphasize maximizing profits rather than stock return while shares in privately controlled firms held by the largest shareholders can be freely traded. We believe that private investors are equally likely to focus on market performance as well as cash flows and therefore we formulate the following hypotheses:

- *H2a: Cash flow rights in state controlled firms have a positive effect on accounting performance based pay-performance relationship, while cash flow rights in non-state controlled firms have a positive effect on market performance based pay-performance relationship.*
- *H2b: Excess control rights in state controlled firms have a negative effect on accounting performance based pay-performance relationship, while excess control rights in non-state controlled firms have a negative effect on market performance based pay-performance relationship.*

Under China's SASAC, SOEs are directly and ultimately controlled by both central and local government, where it is mandatory that state owners must receive cash flows, including profits and dividends, because shares of SOEs are often not tradable unless under the approval of the CSRC and the selling price is only at book value (Xu, 2003). Since 2003, CEOs of SOEs have been evaluated by a combination of annual performance such as return on assets (ROA) and return on sales (ROS) (SASAC, 2003). We therefore hypothesize that:

- *H3a: Cash flow rights have a positive effect on accounting based pay-performance relationship in SOEs.*
- *H3b: Excess control rights have a negative effect on accounting based pay-performance relationship in SOEs.*

SAMBs⁴ are the agency holding state shares that are non-tradable on the market, they do not have cash flow rights from these shares and payouts often have to be remitted directly to different levels of government (Firth et al., 2006). The objectives of SAMB controlled firms are to carry out the instructions of the central or local government and to maintain local employment levels rather than maximize the value of a firm. In most instances CEOs in SAMB controlled firms are officials from the government, with little or no professional background, no rights to select other top executives, and no responsibility for the economic consequences (Zhang, 1998). We therefore hypothesize the following:

- *H4: Cash flow rights and excess control rights have no effect on pay-performance relationship in SAMB controlled firms.*

Our results indicate that SOEs relate CEO pay to firm accounting performance (return on assets and return on sales), while private controlled firms relate CEO pay to market performance (stock return). However, there is no relationship between CEO pay and firm performance in firms controlled by SAMBs. Our regression results show that the cash flow rights of the largest shareholders enhance the accounting performance related pay scheme in SOE controlled firms and improve market performance related pay scheme in privately controlled firms. However, the separation between control rights and cash flow rights shows a negative entrenchment effects by significantly reducing the pay-performance relationship in SOE and privately controlled firms. We also find that cash flow rights in SAMB controlled firms do not appear to affect the pay-performance relationship, which confirm the consensus that these firms do not really have cash flow rights because they must remit earnings back to their superiors (Firth et al., 2006).

We make two major contributions to the literature. First, our research not only sheds light on how cash flow rights and excess control rights affect CEO pay, it also submits new evidence on how cash flow rights and excess control rights affect the

⁴ The term SAMB encompasses state asset management bureaus, state asset operating companies, and state agencies like the Ministry of Finance and Ministry of Agriculture. However, SAMBs, located across provinces and cities, are merely agents of the central government that manage state-owned assets and invest them in listed firms.

pay-performance relationship. Cash flow rights have a positive incentive effect on the pay-performance relationship while excess control rights have a negative entrenchment effect. Second, our study furthers the understanding that different performance based pay schemes are used between state owned enterprises (SOEs) and privately controlled firms. The divergence between control rights and cash flow rights influences pay-performance relationship across firms with different types of ultimate ownership. Our evidence suggests that CEO pay in firms with the state as the controlling shareholder is determined by accounting based performance that is not sensitive to market based firm performance. This is consistent with the private benefits of controlling shareholders because there the CEO pay scheme is to maximize accounting performance to extract greater cash flows.

The rest of the paper proceeds as follows: Section 2 reviews the relevant literature; Section 3 outlines the data and methodology; Section 4 discusses the empirical results; and Section 5 presents the conclusions.

2. Literature review

All extant studies document that disproportional ownership structure has two effects on corporate governance; the positive incentive effect of cash flow rights which enable the largest shareholder to monitor CEO's efficiently, and the negative entrenchment effect of excess control rights which makes it easier for the largest shareholder to expropriate wealth from minority shareholders.

The separation of ownership and control by the largest shareholder has been researched extensively, particularly the cash flow rights and control rights stemming from a concentration of ownership. For example, La Porta et al. (1999) argued that the ultimate controlling shareholders often use a pyramid structure and cross shareholding to obtain excessive control rights over their cash flow rights. Cash flow rights are found to have a positive incentive effect while the divergence between control and cash flow rights has a negative entrenchment effect on corporate governance (Claessens et al., 2002). Similar results were also provided by Lemmon and Lins (2003), Laeven and Levine (2008) and Gompers et al. (2010). Moreover, Johnson et al.

(2000) argue that managerial expropriation is an important form of tunneling which lowers shareholder value. Masulis et al. (2009) agreed and found a positive relationship between control-cash flow rights divergence and CEO pay, while Barontini and Bozzi (2010) found evidence from a sample of Italian listed firms that CEO pay was positively affected by a low divergence of control-cash flow rights. Other studies argued that ownership structure affects the pay-performance relationship. Using a sample of U.S. insurance companies from 1994 to 1996, Ke et al. (1999) found that managerial compensation and ROA was closely related in publicly held insurers. With a sample of China's listed firms between 1998 and 2002, Kato and Long (2005) found that state ownership weakened the pay-performance relationship. Firth et al. (2006) argued that firms having foreign investor or SOEs as their largest shareholder tended to relate CEO pay to accounting performance, whereas firms with a private blockholder as a dominant shareholder tended to relate CEO pay to the performance of the stock market. However, these studies only focused on who the controlling shareholder (i.e. owner type) was and their effect on the pay-performance relationship, they did not explain the channel through which these effects were exercised.

In this paper we fill the gap by using samples of China's listed firms from 2002 to 2007 to examine how and why the largest shareholder ownership structure affects the pay-performance relationship.

3. Data and methodology

3.1. Sample

We compile data from every firm listed on the Shanghai Stock Exchange and Shenzhen Stock Exchange between 2002 and 2007 because information on cash flow rights and control rights has only been available since 2002. Following previous studies, we account for the special consideration of regulated industries by eliminating

financial firms. PT and ST⁵ companies are also excluded because they might bias our results. Finally, we exclude observations with incomplete information on all the variables under analysis. The final sample consists of 1,129 firms and 6,297 firm-year observations from 2002 to 2007. The accounting and financial data are obtained from individual firm's annual reports and the CSMAR database, and the information on managerial compensation, board, and ownership structure from the SinoFin database. CSMAR and SinoFin databases were used in several previous studies (Kato and Long, 2005; Firth et al., 2006, 2007).

There was ample evidence in the literature that in firms where ownership was highly concentrated, the largest shareholders were active in corporate governance and had absolute control over them. Therefore, it is essential to identify the ultimate controlling shareholder in order to examine the effects of ownership structure. By tracing through the chain of ownership we identify the ultimate controlling shareholder of each firm. Moreover, we classify controlling ownership into three types: SAMBs, SOEs and private ownership.

3.2. Methodology

Within the corporate governance framework, most previous studies set up linear models to regress managerial compensation against firm performance and corporate governance variables (Core et al., 1999; Firth et al., 2006, 2007; Canarella and Nourayi, 2008; Cornett et al., 2008). Since this study aims to examine the effects of ownership structure on CEO pay, and test the relationship between managerial compensation and firm performance, we extend previous research by using the regression analyses described below.

The first analysis examines the effect that ownership structure has on the pay-performance relationship across state owned and privately owned (i.e., non-state owned) firms:

⁵ ST stands for Special Treatment, refers to the listed firms that have already got negative net profits for three consecutive years who have the probability of being delisted from the stock exchanges. PT stands for Particular Transfer, refers to the listed firms that are suspended to be traded on the stock exchanges. These PT listed firms can only be traded under the approval of the stock exchanges on every Friday.

$$\begin{aligned}
PAY_{it} = & \alpha_0 + \alpha_1 CASH_{it} + \alpha_2 PERF_{it-1} + \alpha_3 CASH_{it} * PERF_{it-1} + \alpha_4 SIZE_{it} \\
& + \alpha_5 BOARD_{it} + \alpha_6 POND_{it} + \alpha_7 LEV_{it} + \alpha_8 DUALITY_{it} + \alpha_9 TENURE_{it} \\
& + \alpha_{10} FOR_{it} + Industry + Year + \varepsilon_{it}
\end{aligned} \tag{1}$$

where i and t represent the firm and year, and ε_{it} is the error terms related to unobservable features that explain cross sectional variations in CEO pay. PAY is the level of managerial compensation measured by the log of the average top three executive compensation levels. CASH is the cash flow rights of the controlling shareholders. In the additional tests we replace cash flow rights with excess control rights (EXCESS), defined as the difference between the control rights and cash flow rights of the controlling shareholders, to provide some supplementary evidence. PERF is firm performance, we proxy firm performance with four measures, namely the return on assets (ROA), return on sales (ROS), annual stock return (RET) and Tobin's Q (Q), and then regress them in separate equations. SIZE is the log of the total firm assets, BOARD is the log of the total number of directors on the board, POND is the proportion of independent directors, and LEV is the ratio of total debts to total assets. TENURE is the log of the CEO's tenure with the firm as CEO, and DUALITY is a dummy variable coded 1 if the CEO is also the board chairman and 0 otherwise. We also include dummy variables to control for industry and year effects.

We modify our first regression by dividing the ownership of the largest shareholder between state ownership and private investors. Our second regression is shown as follow:

$$\begin{aligned}
PAY_{it} = & \alpha_0 + \alpha_1 CASH_{it} + \alpha_2 PERF_{it-1} + \alpha_3 PSTATE_{it} * PERF_{it-1} + \alpha_4 SIZE_{it} \\
& + \alpha_5 BOARD_{it} + \alpha_6 POND_{it} + \alpha_7 LEV_{it} + \alpha_8 DUALITY_{it} + \alpha_9 TENURE_{it} \\
& + \alpha_{10} FOR_{it} + Industry + Year + \varepsilon_{it}
\end{aligned} \tag{2}$$

where PSTATE is the cash flow rights of state controlled firms. All other variables in the second regression are defined the same as the first regression.

Furthermore, we extend our second regression by dividing state ownership into the two types discussed in Section 1: SAMBs and SOEs. The regression is as follow:

$$\begin{aligned}
PAY_{it} = & \alpha_0 + \alpha_1 CASH_{it} + \alpha_2 PERF_{it-1} + \alpha_3 PSAMB_{it} * PERF_{it-1} \\
& + \alpha_4 PSOE_{it} * PERF_{it-1} + \alpha_6 PPRI_{it} * PERF_{it-1} + \alpha_7 SIZE_{it} \\
& + \alpha_8 BOARD_{it} + \alpha_9 POND_{it} + \alpha_{10} LEV_{it} + \alpha_{11} DUALITY_{it} \\
& + \alpha_{12} TENURE_{it} + \alpha_{13} FOR_{it} + Industry + Year + \varepsilon_{it}
\end{aligned} \tag{3}$$

where PSAMB (PSOE, PPRI) is the cash flow rights of different types of shareholders if that shareholder is the controlling shareholder. Definitions for all the variables are shown in Table 1.

3.3. Measurement of variables

Table 1 provides definitions of the variables included in our regression models, whose selection is explained below.

3.3.1 Managerial compensation

In China, listed firms have had to disclose their levels of managerial compensation in annual reports since 1998. Because these data are reported as the total of basic salary and bonus aggregation of the top three executives' compensation, we base our empirical analysis on this information. That is, consistent with other studies on China, we proxy for managerial compensation using the log of the average top three executives' remuneration (Kato and Long, 2005).

3.3.2 Firm performance

The empirical corporate finance literature measures firm performance using both accounting-based performance and market based performance such as return on assets (Hermalin and Wallace, 2001; Kato and Kubo, 2006 and Cheng, 2008), and stock return (Core et al., 1999; Brick et al., 2006 and Firth et al., 2007) respectively. In addition, we also apply return on sales (ROS) to be robust. Therefore, we use return on assets (ROA), return on sales (ROS), and annual stock return (RET) to proxy for firm performance in separate regressions, which is consistent with previous studies.

In addition to these original performance measures, we adopt industry adjusted measures of ROA, ROS, and RET by calculating the difference between the firm's

annual ROA (ROS, RET) and the median ROA (ROS, RET) of firms in the same industry in the same year. We report our empirical results using industry adjusted measures as the main proxy for performance. We then repeat our analysis using Tobin's Q (Q) as an additional measure of performance, measured as the ratio of market value to firm replacement value. Following Merhebi et al., (2006) and Firth et al., (2007), we use the lagged values of these variables in the regressions because CEO pay responds to a firm's previous performance.

3.3.3 Cash flow rights and control rights

To examine the effects of ultimate shareholder ownership, we calculate the cash flow rights and control rights by investigating the complete chain of corporate ownership. We define the control rights as the weakest link in the chain and cash flow rights as the product of ownership stakes along the chain, which is consistent with previous studies (La Porta et al., 1999; Claessens et al., 2002). For example, ultimate controlling shareholder firm A owns 70% shares of listed firm B, which in turn owns 35% shares of listed firm C. We then construct that firm A controls 35% of firm C, the weakest link in the chain, while the cash flow right is 24.5%, the product of 70% and 35% ($70\% \times 35\%$). Through a pyramid structure, cross-shareholding, and dual-class stocks, the largest shareholder's control rights were always in excess of the cash flow rights (La Porta et al., 1999). Therefore, in the additional tests, we replace cash flow rights with excess control rights, defined as the difference between control rights and cash flow rights, to provide some supportive evidence for our main hypotheses. To determine effective control at any intermediate as well as ultimate level, a cutoff level of 10% is used in all empirical analyses, which follow the argument used by Claessens et al. (2002).

3.3.4 Control variables

Firm size

Previous studies established that CEO pay is its positive and significant relation to

firm size (Conyon, 1997; Core et al., 1999). Not only are larger firms more likely to have relatively complicated operating systems and thus be more likely to hire high quality CEOs (Jensen and Meckling, 1976), but, as documented by Chen et al. (2009) among others, there is a significant and positive relationship between firm size and firm performance in China's listed firms. Accordingly, we use the log of total firm assets, *SIZE*, to proxy for firm size.

Board size

As an internal control mechanism, a board of directors is assumed to ensure that CEOs act in the best interests of their shareholders (Barnhart and Rosenstein, 1998). Small boards of directors are more effective (Yermack, 1996) than large boards because a large number has less influence over CEOs and complicates decision making (Jensen, 1993). Hence, we also control board size, *BOARD*, defining it as the log of the number of directors on a board.

Board composition

Because independent directors have no conflicting relationship with current executives, they can exercise their monitoring power and make decisions independently (Cheng, 2008). We take this into account by defining the variable *POND*, the ratio of independent directors to all directors on the boards.

Leverage

Corporate capital structure is an important determinant in shaping pay for top executives (Basu et al., 2007; Hernan, 2007) and was also found to be linked to firm performance (Demsetz and Villalonga, 2001; Chen et al., 2009), we therefore include the variable *LEV*, defined as the ratio of book value of total debts to total assets.

CEO-Chairman duality

Modern theory suggests that ownership and control should be separated (Jensen and Meckling, 1976) and that higher agency problems exist when the CEO is also the chairman of the board (Yermack, 1996). For instance, Core et al. (1999) found that CEOs received higher pay when they also chaired the board. We therefore include

CEO duality, *DUALITY*, as an indicator variable equal to 1 if the CEO is also chairman of the board, and 0 otherwise.

CEO tenure

Although it is usual to relate CEOs' pay to their years of experience as CEO in a firm (Palia, 2001), Murphy (1986) suggested that their ability was not observable at the time of hiring, so payment increased as they proved themselves over the years. However, Cornett et al. (2008) argued that top executives with little experience needed more time to become familiar with their firms and industries, but that top executives with longer tenure, although they have more career concerns, enjoyed better reputations and can therefore demand higher pay (Brick et al., 2006). Accordingly, we use the log of CEO tenure, *TENURE*, as a measure of CEO experience.

Foreign investors

In China, listed firms can also issue H and N shares, which can only be purchased by foreign investors. As outside blockholders, these foreign investors can effectively monitor managers using their professional knowledge. We therefore include the dummy variable, *FOR*, coded 1 if a firm has foreign investors and 0 otherwise.

Other control variables

The equations also include two additional dummy variables: *Year*, a column vector of a dummy variable to control the economy or market effects over time, and *Industry*, a column vector of an SIC-code based dummy variable to control variation across industries.⁶

Table 1

Variable definitions

Variables	Definition
<i>Compensation</i>	
Managerial compensation (PAY)	Log of the average top three executives' compensation

⁶ We follow Firth et al. (2006) and classify firms in our sample into five groups: industrial, commercial, public utility, property, and conglomerate (all other industries). To avoid the dummy variable trap, we use four dummy variables to represent these five categories.

<i>Firm performance</i>	
Return on assets (ROA)	Net income / total assets
Return on sales (ROS)	Net income/sales
Stock return (RET)	Annual stock return
Tobin's Q (Q)	Market value/replacement value ^a
<i>Ownership structure</i>	
Cash flow rights (CASH)	Cash flow rights held by the ultimate controlling shareholder
Excess control rights (EXCESS)	Difference between the control rights and cash flow rights
PSTATE	Cash flow rights of state controlled firms
PSAMB	Cash flow rights of SAMB controlled firms
PSOE	Cash flow rights of SOE controlled firms
PPRI	Cash flow rights of privately controlled firms
<i>Firm and CEO characteristics</i>	
Firm size (SIZE)	Log of total assets
Board size (BOARD)	Log of total directors on board
Board composition (POND)	Independent directors/total directors
Leverage (LEV)	Total debts/total assets in book value
CEO-chair duality (DUALITY)	Equal to 1 if the CEO is also the chairman of the board
CEO tenure (TENURE)	Log of years the CEO has been this position
Foreign investor (FOR)	Equal to 1 if the firm has foreign investors
<i>Other variables</i>	
Industry (Industry) ^b	Equal to 1 for the specific industry
Year (Year)	Equal to 1 for the specific year

^a Market value is measured as the sum of the market value of equity and the book value of debt; replacement value is measured using the book value of total assets.

^b We create four dummy variables to represent the five groups of listed firms borrowed from Firth et al. (2006): industrial, commercial, public utility, property, and conglomerate (all other industries).

3.4. Sample statistics

The first section of Table 2 presents descriptive statistics on managerial compensation, firm performance, and firm and CEO characteristics, averaged across 2002 to 2007 for the entire sample. Panels A, B, and C in this table report detailed statistics for managerial compensation in these firms based on years, industries, and dominant shareholders. The means (medians) in Panel A indicate a steady 151.72% (164.81%) increase in CEO pay across our sample period, ranging from 131,023RMB (95,666RMB) in 2002 to 329,811RMB (253,333RMB) in 2007. Nonetheless, these pay levels were much lower than those reported in research for the U.S., U.K., and

other countries (Core et al., 1999; Brick et al., 2006; Merhebi et al., 2006; Kato et al., 2007; Basu et al., 2007), a pay level gap that may be attributable to smaller firms, higher rates of CEO turnover, and/or lack of long term incentives⁷ (Firth et al., 2002; Kato and Long, 2005).

After identifying three types of firms by ownership (i.e., a SAMB, SOE or private investors as the controlling shareholder), we find that CEO pay varies across industries and firms according to the different types of dominant shareholder (see Table 2). For example, the mean (median) of CEO pay in commercial industry was 236,011RMB (178,683RMB), whereas the mean (median) of CEO pay in property industry was 339,343RMB (230,000RMB). Likewise, the mean (median) for SAMB controlled firms was 177,740RMB (129,333RMB), whereas the mean (median) for SOE controlled firms was 241,229RMB (190,400RMB).

Table 2

Descriptive statistics

Variables	Mean	Median	Min	Max	Std. Dev.
<i>Compensation</i>					
CEO average pay	219,939	160,000	6,666	470,6667	75,649
<i>Firm performance</i>					
Return on assets (ROA) %	2.26	2.64	-168.26	46.31	8.49
Return on sales (ROS) %	-0.043	0.039	-83.69	46.63	1.87
Stock return (RET) %	39.69	-3.96	-90.93	1611.78	104.68
Tobin's Q (Q)	1.16	0.96	0.13	23.44	0.76
<i>Ownership structure</i>					
Cash flow rights (CASH)	34.41	32.17	0.51	100	18.11
Excess control rights(EXCESS) ^a	6.38	0	0	70.56	9.06
<i>Firm characteristic</i>					
Assets (millions)	3940	1770	27.3	719000	17600
Board size (BOARD)	9.76	9	4	23	2.20
Board composition (POND)	3.13	3	0	10	0.94
Capital structure (LEV) %	49.71	50.25	0.02	1037.51	25.87
<i>CEO characteristic</i>					
CEO duality (DUALITY)	0.11	0	0	1	0.31
CEO tenure (TENURE)	2.55	2	0.08	12.42	1.85

⁷ Long-term incentive schemes were rare in China's listed firms accounting for less than 5% of the total listed firms, and stock options and restricted stocks have only been available to top executives since the end of 2006. For example, since 2006, there were 161 listed firms who exercised stock options. Until the end of 2009, this number decreased to 99 and then only 47 by the end of June 2010. Because of data limitation, we still use cash compensation in this study.

Panel A: Compensation based on year

2002	131,023	95,666	6,666	1,575,308	122,442
2003	170,329	126,666	7,666	1,628,234	153,738
2004	212,776	160,379	10,266	3,210,000	213,192
2005	218,176	167,633	8,966	2,726,667	205,604
2006	253,069	196,666	12,000	3,740,000	243,939
2007	329,811	253,333	166,66	470,6667	315,655

Panel B: Compensation based on industry

Industrial	202,353	140,333	7,200	3,486,567	209,495
Commercial	236,011	178,683	13,666	1,309,300	203,546
Public utility	245,134	202,383	11,424	1,848,030	204,141
Property	339,343	230,000	12,566	4,706,667	485,295
Conglomerate	231,535	185,870	6,666	1,707,057	194,260

Panel C: Compensation based on ownership

SAMB	177,740	129,333	9,246	1,225,333	160,800
SOE	241,229	190,400	7,200	4,706,667	212,011
PRIVATE	211,333	146,966	6,666	1,792,933	210,226

The figures in Panel A are the average of six years from 2002 to 2007.

The figures for all the value variables are in China's currency, RMB.

^a Excess control is defined as the difference between the control rights and cash flow rights of the ultimate controlling shareholder, which is consistent with Claessens et al. (2002). This information is only available in the listed firms' annual reports since 2002.

Table 3 reports the significance of differences in means and medians of CEO pay between the groups. For example, the *t*-statistic (*z*-statistic) of -6.52 (-9.34) in the comparison of SAMB versus SOE shows that the mean (median) CEO pay was significantly higher for SOE controlled firms than SAMB controlled firms. These results can be summarized as follows: the negative *t*-statistics in the comparisons of SAMB versus all the other owner types indicate that CEOs in SAMB controlled firms received lower payments, while the positive *t*-statistics in the comparisons of SOE versus all the other owner types suggest that CEOs in SOE controlled firms received the highest payment among all types of listed firms.

Table 3

Test of differences in means and medians based on ownership

SAMB vs. SOE	SAMB vs. PRIVATE	SOE vs. PRIVATE
-6.52*** ^a	-3.82*** ^a	4.86*** ^a
-9.34*** ^b	-3.81*** ^b	-7.17*** ^b

*, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

^a *t*-value from the *t*-test of differences in means.

^b z-value from the Mann-Whitney *U*-test of differences in medians.

4. Empirical results

4.1. Pearson correlations

As Table 4 shows, the Pearson correlations between each pair of variables (contemporaneous value) are lower, which indicates that multi-collinearity does not exist.

Table 4

Key variables: Pearson correlation matrix

	ROA	ROS	RET	Q	SIZE	LEV	BOARD	POND
ROA	1							
ROS	0.3005	1						
RET	0.1939	0.0401	1					
Q	-0.0713	-0.0494	0.5153	1				
SIZE	0.2443	0.0842	0.1836	-0.1651	1			
LEV	-0.5270	-0.1539	0.0291	0.3044	0.0790	1		
BOARD	0.0596	0.0296	-0.0298	-0.0768	0.2126	0.0003	1	
POND	0.0272	0.0077	0.1798	0.0894	0.0055	0.0536	-0.2555	1

ROA is firm return on assets (net income divided by total assets); ROS is firm return on sales (net income divided by total sales). RET is firm stock return; Q is defined as the ratio of market value to firm replacement value; SIZE is log of total firm assets; LEV is the= ratio of total debts to total assets; BOARD is the log of total number of directors on the boards; POND is the proportion of independent directors on the board/ratio of the number of independent directors to total number of directors.

4.2. Empirical results

As shown in Table 5, which presents the results for Equation (1) broken out by different firm performance measures, the lagged industry-adjusted ROA, ROS, RET and Tobin's Q are positively and significantly associated with CEO pay. This result suggests that top executives tend to be paid more in firms that perform well in the market, or have higher corporate value. While this result supports our hypotheses, albeit the significantly positive effect of stock return is inconsistent with findings by Firth et al. (2007) who argued that market performance does not provide an incentive

to general CEOs⁸. For example, the coefficient on industry adjusted ROA indicates that one unit increase in industry adjusted ROA lead to a 36.34% increase in CEO pay level (column 1).

The negative coefficients of CASH (see Table 5) provide evidence that CEO pay is lower in firms where the largest shareholders have higher cash flow rights, and the coefficients are significant. Moreover, all the interaction terms used to test whether ownership is associated with performance based pay for CEOs are positive and significant, except CASH*RET_{t-1}. This finding not only suggests that when deciding on CEO pay, state owned firms give more weight to profitability and value, it also shows that, in support of Hypotheses 1, cash flow rights have a positive incentive effect on the pay-performance relationship.

In line with previous studies (Conyon, 1997; Hermalin and Wallace, 2001; Girma et al., 2007), our results also show that larger firms paid their managers higher salaries, and with Basu et al.'s (2007) finding of a significantly negative effect of firm leverage, managerial compensation is negatively related to leverage, that is, firms with higher debt pay their managers less. This latter effect may be attributable to debt being seen as monitoring by external debt holders (John and John, 1993).

Table 5

Regression results of cash flow rights effects on CEO pay

Dependent variable: managerial compensation				
Constant	6.028***(19.46)	5.500***(17.76)	5.598***(17.30)	4.962***(16.41)
CASH	-0.007***(-9.02)	-0.006***(-8.51)	-0.005***(-6.83)	-0.003***(-3.70)
ROA _{t-1}	1.979***(4.28)			
ROS _{t-1}		0.018(0.15)		
RET _{t-1}			0.183***(3.64)	
Q _{t-1}				0.309***(3.94)
CASH*ROA _{t-1}	0.034***(2.81)			
CASH*ROS _{t-1}		0.016***(4.68)		
CASH*RET _{t-1}			0.002(1.24)	
CASH*Q _{t-1}				0.005**(2.04)
SIZE	0.256***(17.92)	0.284***(20.01)	0.280***(18.81)	0.317***(23.03)
BOARD	0.228***(3.79)	0.217***(3.57)	0.221***(3.46)	0.215***(3.56)
POND	0.553***(2.84)	0.550**(2.79)	0.501**(2.41)	0.398**(2.03)

⁸ Using a sample of China's listed firms from 1998 to 2000, Firth et al. (2007) find no relationship between CEO pay and market performance.

LEV	0.031(0.57)	-0.097*(-1.77)	-0.168***(-3.37)	-0.234***(-4.85)
DUALITY	0.078*(1.95)	0.071*(1.77)	0.059(1.38)	0.061(1.53)
TENURE	0.067***(5.05)	0.076***(5.69)	0.078***(5.63)	0.075***(5.65)
FOR	0.377***(8.46)	0.364***(8.06)	0.368***(7.80)	0.349***(7.82)
Industry	Included	Included	Included	Included
Year	Included	Included	Included	Included
Adjusted R ²	0.2408	0.2217	0.2295	0.2336
Obs	3286	3286	3286	3286

Dependent variable is managerial compensation. Firm performance is measured by four variables: ROA, ROS, RET and Q. We apply the industry-adjusted firm performance in the regressions. CASH is the cash flow rights of the ultimate controlling shareholder. SIZE, BOARD, POND, LEV, TENURE, DUALITY and FOR are measured as in Table 1.

The *t*-statistics, computed using the White (1980) heteroskedasticity robust standard error, are given in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Variables such as the size of a board and number of independent directors have a positive impact on managerial compensation. This interesting result differs from Conyon and Peck (1998) and Firth et al. (2007), who found a negative effect of the size of a board and an insignificant effect of the proportion of independent directors. Our results, however, are consistent with the evidence that small boards are more effective (Yermack, 1996) and large boards have a more doubtful influence on CEOs (Jensen, 1993).

We also find no relationship between duality and CEO pay, which is similar to Conyon's (1997) analysis of British firms, but contrary Core et al.'s (1999) findings that duality in U.S firms lead to higher CEO pay. We do note a positive relationship between CEO tenure and CEO pay, which is not only consistent with most previous studies (Brick et al., 2006; Cornett et al., 2008) but echoes the intuitive assumption of a relationship between CEO pay and years of experience (Palia, 2001). Interestingly, in line with our conjecture, we also find that CEOs receive higher payment if a firm has foreign investors.

Table 6 reports the regression results for Equation (2) with a primary focus on the ownership coefficients and interaction terms. A close examination of the interaction terms also reveals some interesting outcomes. They are positive when we use profitability to measure performance but are negative when performance is measured as stock return and firm value. This result shows that SOEs put great emphasis on

profitability while privately controlled firms care more about market performance. In fact, during the period of this study, SOEs achieved a higher average growth in operating sales, which supports Hypotheses 2a. However, the coefficients are only marginally significant for CASH*ROS_{t-1}, and insignificant for other terms, so we divide state ownership into two types of firms where the ultimate controlling shareholder is SAMB and SOE, respectively, and run the regression (3).

Table 6

Regression results of cash flow rights of state and non-state controlled firms

Dependent variable: managerial compensation				
Constant	5.992***(19.34)	5.506***(17.71)	5.589***(17.27)	4.893***(16.18)
CASH	-0.006***(-8.73)	-0.006***(-8.08)	-0.005***(-6.76)	-0.005***(-6.40)
ROA _{t-1}	3.168***(11.20)			
ROS _{t-1}		0.520***(6.35)		
RET _{t-1}			0.232***(8.48)	
Q _{t-1}				0.442***(9.27)
PSTATE*ROA _{t-1}	0.025(1.18)			
PSTATE*ROS _{t-1}		0.012*(1.70)		
PSTATE*RET _{t-1}			-0.001(-0.43)	
PSTATE*Q _{t-1}				-0.001(-0.02)
Size	0.257***(18.02)	0.283***(19.86)	0.280***(18.83)	0.317***(23.01)
Board	0.223***(3.71)	0.208***(3.43)	0.221***(3.47)	0.217***(3.61)
Pond	0.557***(2.86)	0.552***(2.79)	0.497***(2.39)	0.406***(2.07)
Lev	0.048(0.92)	-0.042(-0.78)	-0.164***(-3.32)	-0.233***(-4.82)
Duality	0.076*(1.91)	0.068*(1.68)	0.057(1.34)	0.061(1.52)
Tenure	0.067***(5.01)	0.077***(5.70)	0.077***(5.60)	0.075***(5.61)
For	0.373***(8.37)	0.360***(7.97)	0.368***(7.80)	0.347***(7.75)
Industry	Included	Included	Included	Included
Year	Included	Included	Included	Included
Adjust R ²	0.2393	0.2171	0.2292	0.2324
Obs	3286	3286	3286	3286

Dependent variable is managerial compensation. CASH is the cash flow rights of the ultimate controlling shareholder. PSTATE represents the cash flow rights of state controlled firms. All other variables are defined the same as those in previous tables.

The *t*-statistics in parentheses are computed using the White (1980) heteroscedasticity robust standard error. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

The estimation results of regression (3) are given in Table 7, where we apply the controlling shareholder cash flow rights to measure the ownership structure. Table 7 reports generally negative coefficients on cash flow rights regardless of performance

measures which indicate that cash flow rights will reduce the level of CEO pay. More importantly, we focus on the interaction terms. These terms are positive when firm performance is measured by ROA and ROS and are statistically significant for SOE controlled firms. The results indicate that CEO pay is related to profitability and the cash flow rights of SOEs enhance the pay-performance relationship in SOE controlled firms, which is consistent with our hypothesis 3a. The coefficients are economically significant. For example, in column 1 of Table 7, the coefficient of $PSOE*ROA_{t-1}$ indicates that a 1% increase in SOE cash flow rights lead to a 3.2% increase in pay-performance sensitivity. The interaction terms with stock return measures of performance are positive and only significant when firms have private investors as the controlling shareholders. This result is consistent with our hypothesis 2a that a private controller is more likely to relate CEO pay to market performance, and again we find evidence that cash flow rights have positive incentive effects on corporate governance. However, the interaction terms of SAMB controlled firms are insignificant, which is consistent with Hypotheses 4. The estimated coefficients on control variables are similar with those reported in Table 5 and 6.

Table 7

Regression results of cash flow rights across three types of firms

Dependent variable: managerial compensation				
Constant	6.028***(19.45)	5.518***(17.79)	5.597***(17.29)	4.705***(10.26)
CASH	-0.007***(-9.03)	-0.006***(-8.50)	-0.005***(-6.83)	-0.002**(-2.12)
ROA _{t-1}	2.139***(4.38)			
ROS _{t-1}		0.079(0.52)		
RET _{t-1}			0.181***(3.57)	
Q _{t-1}				0.073(1.21)
PSAMB*ROA _{t-1}	0.021(0.85)			
PSOE*ROA _{t-1}	0.032**(2.68)			
PPRI*ROA _{t-1}	0.015(0.56)			
PSAMB*ROS _{t-1}		0.012(1.58)		
PSOE*ROS _{t-1}		0.015***(4.33)		
PPRI*ROS _{t-1}		0.009(1.15)		
PSAMB*RET _{t-1}			0.002(0.53)	
PSOE*RET _{t-1}			0.002(1.18)	
PPRI*RET _{t-1}			0.002*(1.78)	
PSAMB*Q _{t-1}				0.008(1.60)

PSOE*Q _{t-1}				0.005**(2.46)
PPRI*Q _{t-1}				0.009**(1.96)
SIZE	0.256***(17.91)	0.283***(19.89)	0.280***(18.81)	0.317***(15.35)
BOARD	0.227***(3.78)	0.216***(3.52)	0.221**(3.46)	0.158*(1.88)
POND	0.556***(2.85)	0.549***(2.78)	0.501*(2.41)	0.735**(2.89)
LEV	0.030(0.58)	-0.084(-1.50)	-0.168(-3.37)	-0.182*(-1.86)
TENURE	0.067***(5.05)	0.076***(5.66)	0.078***(5.63)	0.085***(6.00)
FOR	0.375***(8.42)	0.363***(8.05)	0.368***(7.80)	0.332***(5.17)
DUALITY	0.078*(1.95)	0.072*(1.78)	0.059(1.38)	0.082(1.43)
Industry	Included	Included	Included	Included
Year	Included	Included	Included	Included
Adjusted R ²	0.2410	0.2219	0.2295	0.1927
Obs	3286	3286	3286	3286

PSAMB (PSOE, PPRI) represents the cash flow rights of each type of controlling shareholder. All the other variables are defined the same as those in previous tables.

The *t*-statistics in parentheses are computed using the White (1980) heteroscedasticity robust standard error. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

In order to provide some supplementary evidence and disentangle the incentive and entrenchment effects of the largest shareholder, we repeat our analyses of regression (1) to (3) by replacing cash flow rights (CASH) with ultimate controlling shareholder excess control rights (EXCESS). The results are shown in Table 8 to 10. Our primary focus is on the interaction terms between ownership and performance. The general results show negative coefficients for most interaction terms which helped support Hypotheses 1b, 2b, and 3b, that deviation between control rights and cash flow rights have negative entrenchment effects on corporate governance, which is reflected by a weaker pay-performance relationship. We obtain opposite results when excess control rights are used instead of cash flow rights. These results are broadly consistent with previous studies on the separation of ownership and control (La Porta et al., 1999; Claessens et al., 2002). Meanwhile, we find there is a positive relationship between CEO pay and excess control rights, which is consistent with the argument that it is easier for a CEO to expropriate wealth where corporate governance is weak, reflected by a higher divergence between control rights and cash flow rights (Core et al., 1999; Claessens et al., 2002).

Table 8

Regression results of excess control rights effects on CEO pay

Dependent variable: managerial compensation				
Constant	6.160***(19.67)	5.665***(18.09)	6.049***(19.70)	5.202***(17.16)
EXCESS	0.003**(2.14)	0.003**(2.37)	0.002(1.32)	0.001(0.30)
ROA _{t-1}	3.085***(9.73)			
ROS _{t-1}		0.503***(5.68)		
RET _{t-1}			0.255***(11.80)	
Q _{t-1}				0.565***(11.07)
EXCESS*ROA _{t-1}	-0.034(-1.26)			
EXCESS*ROS _{t-1}		-0.012*(-1.51)		
EXCESS*RET _{t-1}			-0.005**(-2.53)	
EXCESS*Q _{t-1}				-0.012***(-3.02)
SIZE	0.232***(16.48)	0.259***(18.53)	0.247***(18.18)	0.296***(21.99)
BOARD	0.261***(4.29)	0.248***(4.02)	0.266***(4.40)	0.242***(4.00)
POND	0.650***(3.30)	0.629***(3.16)	0.498**(2.55)	0.451**(2.29)
LEV	0.071(1.35)	-0.019(-0.35)	-0.125**(-2.60)	-0.209***(-4.34)
DUALITY	0.072***(5.38)	0.082***(6.03)	0.075***(5.64)	0.079***(5.93)
TENURE	0.106**(2.63)	0.095**(2.34)	0.086**(2.15)	0.078**(1.96)
FOR	0.391***(8.67)	0.374***(8.21)	0.395***(8.83)	0.366***(8.16)
Industry	Included	Included	Included	Included
Year	Included	Included	Included	Included
Adjusted R ²	0.2227	0.2028	0.2320	0.2262
Obs	3286	3286	3286	3286

Dependent variable is managerial compensation. Firm performance is measured by four variables: ROA, ROS, RET and Q. We apply the industry-adjusted firm performance in the regressions. EXCESS is the excess control rights of the ultimate controlling shareholder. SIZE, BOARD, POND, LEV, TENURE, DUALITY and FOR are measured as in Table 1.

The *t*-statistics, computed using the White (1980) heteroskedasticity robust standard error, are given in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 9

Regression results of excess control rights of state and non-state controlled firms

Dependent variable: managerial compensation				
Constant	6.167***(19.69)	5.647***(18.05)	5.802***(17.88)	5.141***(16.97)
EXCESS	0.003**(2.04)	0.003**(2.33)	0.003**(2.24)	0.003*(1.64)
ROA _{t-1}	2.996***(10.74)			
ROS _{t-1}		0.521***(6.64)		
RET _{t-1}			0.264***(9.55)	
Q _{t-1}				0.513***(11.15)
PSTATE*ROA _{t-1}	0.046(1.34)			
PSTATE*ROS _{t-1}		0.029**(2.72)		
PSTATE*RET _{t-1}			0.005(1.51)	
PSTATE*Q _{t-1}				0.007*(1.93)
Size	0.233***(16.49)	0.261***(18.62)	0.256***(17.67)	0.298***(22.10)
Board	0.258***(4.24)	0.248***(4.04)	0.246***(3.83)	0.246***(4.05)

Pond	0.655***(3.33)	0.655***(3.28)	0.599**(2.87)	0.459**(2.33)
Lev	0.063(1.18)	-0.051(-0.92)	-0.136**(-2.74)	-0.211***(-4.37)
Duality	0.104**(2.60)	0.096**(2.38)	0.078*(1.82)	0.077*(1.94)
Tenure	0.072***(5.39)	0.083***(6.09)	0.081***(5.87)	0.079***(5.91)
For	0.391***(8.69)	0.378***(8.30)	0.388***(8.17)	0.365***(8.13)
Industry	Included	Included	Included	Included
Year	Included	Included	Included	Included
Adjust R ²	0.2228	0.2041	0.2192	0.2249
Obs	3286	3286	3286	3286

Dependent variable is managerial compensation. EXCESS is the excess control rights of the ultimate controlling shareholder. PSAMB (PSOE, PPRI) represents the excess control rights of each type of controlling shareholder. All other variables are defined the same as those in previous tables.

The *t*-statistics in parentheses are computed using the White (1980) heteroscedasticity robust standard error. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 10

Regression results of excess control rights across three types of firms

Dependent variable: managerial compensation				
Constant	6.163***(19.67)	5.673***(18.12)	5.799***(17.87)	5.248***(17.26)
EXCESS	0.003**(2.07)	0.003**(2.18)	0.003**(2.30)	0.003**(2.11)
ROA _{t-1}	3.080***(9.71)			
ROS _{t-1}		0.527***(5.90)		
RET _{t-1}			0.279***(9.27)	
Q _{t-1}				0.568***(11.09)
PSAMB*ROA _{t-1}	-0.048(-0.59)			
PSOE*ROA _{t-1}	-0.015(-0.41)			
PPRI*ROA _{t-1}	-0.050*(-1.88)			
PSAMB*ROS _{t-1}		-0.010(-1.07)		
PSOE*ROS _{t-1}		-0.020(-1.32)		
PPRI*ROS _{t-1}		-0.029**(-2.61)		
PSAMB*RET _{t-1}			-0.002(-0.13)	
PSOE*RET _{t-1}			-0.006(-1.42)	
PPRI*RET _{t-1}			-0.006*(-1.73)	
PSAMB*Q _{t-1}				-0.038(-0.18)
PSOE*Q _{t-1}				-0.017***(-2.91)
PPRI*Q _{t-1}				-0.010**(-2.61)
SIZE	0.233***(16.48)	0.259***(18.52)	0.257***(17.68)	0.294***(21.81)
BOARD	0.260***(4.28)	0.247***(4.01)	0.245***(3.81)	0.243***(4.01)
POND	0.651***(3.30)	0.650***(3.26)	0.596***(2.86)	0.413**(2.10)
LEV	0.065(1.22)	-0.044(-0.79)	-0.135**(-2.71)	-0.205***(-4.25)
TENURE	0.072***(5.38)	0.082***(6.01)	0.082***(5.91)	0.079***(5.95)
DUALITY	0.106**(2.63)	0.097**(2.40)	0.078*(1.84)	0.084**(2.10)

FOR	0.390***(8.65)	0.375***(8.23)	0.388***(8.19)	0.369***(8.22)
Industry	Included	Included	Included	Included
Year	Included	Included	Included	Included
Adjusted R ²	0.2229	0.2049	0.2197	0.2284
Obs	3286	3286	3286	3286

Dependent variable is managerial compensation. PSAMB (PSOE, PPRI) represents the excess control rights of each type of controlling shareholder. All the other variables are defined the same as those in previous tables.

The *t*-statistics in parentheses are computed using the White (1980) heteroscedasticity robust standard error. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

4.3. Endogeneity problem

Because endogeneity was one potential problem for this study, in our regressions we consider firm performance an exogenous variable that, together with other explanatory variables, has an explanatory impact on managerial compensation. However, because firm performance can still be seen as an endogenous variable and a function of other firm-specific characteristics, we check the robustness of the results by estimating our three regressions using 2SLS. In the first stage we use an OLS model to obtain the fitted values of firm performance by regressing it on a set of lagged control variables in regression (1). In the second stage the fitted values are used in place of the firm performance in regressions that are the same as those reported in Table 5, Table 6 and Table 7. The general results are similar to those shown in previous tables but for the sake of brevity we only report the results of the first regression in Tables 11.

Table 11

2SLS estimation of regression (1)

Dependent variable: managerial compensation				
Panel A: 2SLS estimation results of regression (1)				
Constant	6.098***(17.10)	5.450***(16.83)	7.388***(16.94)	5.022***(16.10)
CASH	-0.006**(-2.32)	-0.007***(-2.71)	-0.013***(-2.74)	-0.008***(-2.05)
ROA _{t-1}	1.369***(3.79)			
ROS _{t-1}		0.053**(2.04)		
RET _{t-1}			0.175***(6.36)	
Q _{t-1}				0.259(0.07)
CASH*ROA _{t-1}	0.169*(1.94)			

CASH*ROSt-1		0.052**(2.03)		
CASH*RETt-1			0.051***(4.38)	
CASH*Qt-1				0.012*(1.69)
SIZE	0.246***(13.97)	0.274***(18.18)	0.190***(10.41)	0.297***(19.07)
BOARD	0.198***(3.68)	0.187***(3.50)	0.241***(4.44)	0.185***(3.57)
POND	0.763***(4.61)	0.760***(4.55)	0.441***(2.43)	0.758***(4.45)
LEV	0.091(1.36)	-0.077(-1.24)	-0.081*(-1.70)	-0.144***(-3.06)
DUALITY	0.098***(2.81)	0.091***(2.57)	0.089***(2.22)	0.081***(2.44)
TENURE	0.077***(6.25)	0.086***(7.24)	0.068***(4.47)	0.095***(7.40)
FOR	0.377***(9.66)	0.364***(9.07)	0.428***(9.99)	0.349***(8.72)
Industry	Included	Included	Included	Included
Year	Included	Included	Included	Included
Adjusted R ²	0.2012	0.1829	0.1215	0.1775
Obs	4895	4895	4895	4895

Dependent variable is managerial compensation. Firm performance is measured by four variables: ROA, ROS, RET and Q. We apply the industry-adjusted firm performance in the regressions. All the other variables are measured as in Table 5.

The *t*-statistics, computed using the White (1980) heteroskedasticity robust standard error, are given in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

We repeat the analyses by winsorizing the top and bottom 1% of the CEO pay variable to excluding any influence from the outliers, and the results are broadly consistent with those shown in the previous tables. All firm performance coefficients are positive and significant. More important, the interaction terms between cash flow rights and firm performance are all positive and $PSOE*ROA_{t-1}$, $PSOE*ROS_{t-1}$ and $PPRI*RET_{t-1}$ are statistically significant.

5. Conclusion

China's ongoing economic reform and corporate restructuring, which focuses primarily on improving management, is accelerating the corporatization of traditional SOEs. CEO and top manager's incentives, being the central theme in such reform, are poorly understood. We therefore take advantage of data produced since the 2002 mandate that listed firms in China disclose the largest shareholder cash flow rights and control rights in their annual reports to examine the effects on the relationship between managerial compensation and firm performance.

Our empirical results show that cash flow rights in the hands of the ultimate controlling shareholder have an incentive effect on the pay-performance relationship.

In particular, the higher cash flow rights can better align CEO pay with firm profitability in SOEs, and stock return in privately controlled firms. We also provide similar evidence to Claessens et al. (2002), that divergence between control rights and cash flow rights have negative entrenchment effects on the pay-performance relationship. These observations suggest that the development of a market economy in China has important implications for CEO pay.

In the Chinese context, we examine the pay-performance relationship in firms where different types of controlling owners have dissimilar objectives and motivations. Our multivariate analysis results show that the pay-performance scheme has been effective in SOE and privately controlled firms, albeit depending on different performance measures. In SOEs, CEO pay is linked to firm accounting performance (ROA and ROS). This is consistent with controlling state owners whose shares are non-tradable but who are entitled to cash flows. In privately controlled firms, however, CEO pay is sensitive to market performance, which is consistent with literature on US firms.

Overall, our study results indicate that ownership structure and types of controlling shareholders have jointly affected the CEO pay-performance relationship. Therefore, to better understand the causes and consequences of CEO compensation, future studies should focus on the unique characteristics of the institutional environment, such as corporate governance and ownership structure.

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