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Xiaofei Pan

University of Wollongong, xpan@uow.edu.au

Gary G. Tian

University of Wollongong, gtian@uow.edu.au

Shiguang Ma

University of Wollongong, shiguang@uow.edu.au

Aelee Jun

University of Wollongong, ajun@uow.edu.au

Qingliang Tang

University of Western Sydney

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Abstract

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Keywords

china, performance, firm, structure, ownership, compensation, listed, firms, managerial

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Managerial Compensation, Ownership Structure and Firm Performance in China's Listed Firms

Xiaofei Pan¹, Gary Gang Tian^{2*}, Shiguang Ma³, Aelee Jun⁴, Qingliang Tang⁵

*1, 2 3 and 4-School of Accounting and Finance, Faculty of Commerce, University of Wollongong, Australia
5- School of Accounting, university of Western Sydney*

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Abstract: This paper investigates managerial compensation and its relationship with firm performance in China's listed firms. In China, the largest shareholder dominates other shareholders, controls the firm and therefore exercises substantial impacts on manager compensation. After controlling for other firm and industry characteristics, we find that manager remuneration is greater and pay-performance relation is stronger for privately-controlled firms than for state-controlled firms. We also document that state-controlled firms exercise performance-based manager incentive schemes, which is contrary to evidence found in some earlier studies. Our results also indicate that top executives in firms with a foreign ownership are more highly compensated, relative to those without foreign ownership.

Key words: Managerial compensation; Firm performance; Ownership structure

* Contact author Associate Professor Gary Tian: School of Accounting and Finance, Faculty of Commerce, University of Wollongong, NSW 2522 Australia. E-mail: gtian@uow.edu.au.

1 Introduction

Managerial compensation and its determinants has remained a hot topic and research results have experienced tremendous growth in the US and other developed countries (Jensen and Murphy, 1990; Yermack, 1996; Core et al, 1999; Swan and Sung, 2008; Cornett et al, 2008), but only a few studies has been conducted in China. Indeed, China provides an interesting research background in relation to managerial compensation with the adoption of market economy through corporatization and privatization². As a consequence of the economic reform and corporate restructuring, a number of enterprises with various ownership characteristics are listed on the Shanghai and Shenzhen stock exchanges. The managers of listed firms in China become more powerful in corporate decision making and hence in determining the shareholders' wealth (Groves et al, 1994; Clarke, 2003), while the agency problem that managers take the actions on their own interest has drawn owners' serious concerns. Therefore, an appropriate incentive mechanism that aligns the interest of managers with that of shareholders acts an important role in solving agency problem and in the success of Chinese economic reforms (Firth et al, 2006).

The purpose of this study is to investigate the relation between managerial compensation and firm performance in China's listed firms. Much of the theoretical and empirical research has been conducted in developed countries. China's listed firms have a special ownership feature that the largest shareholders have a substantially dominant control over the direction of the firms. Therefore, we examine whether the ownership structure has an impact on the compensation of top executives and pay-performance relation in different types of firms. Some of the prior studies use the dominant share type representing owner type, and this standard can lead to bias results (Chen et al, 2008). In this study, we aim to examine the impact of ownership structure in a more sophisticated way. We carefully identify different types of final controlling shareholders based on different motivations

² Corporatization is the fact that former state-controlled enterprises were transformed to modern listed firms, and Privatization means that former SOEs issued shares to the public, while the central government is still controlling the dominant role, so the corporate restructuring in China is partial.

and re-clarify the state and legal entity shareholders. Further, this paper applies a comparatively new panel data of China's listed firms during the period from 2002 to 2005 for empirical study.

Due to the historical reasons³, the ownership structure of listed firms in China is significantly different to that of their counterparts in other countries. The shares issued in China can be divided into three types: state shares, legal entity shares and tradable common shares. State shares are held by central and local government while legal entity shares are held by state-owned enterprises. Both state shares and legal entity shares are not tradable on stock exchanges, but are transferable under the approval of the China Securities Regulatory Commission (CSRC). Tradable common shares are in the hands of individuals and private organizations, which can be traded on either of Shanghai or Shenzhen Stock Exchange. On average state shares and legal entity shares account for two-thirds of total outstanding shares in firms listed on Shanghai and Shenzhen Exchanges.

One of the unique ownership characteristic in China is that for the majority of the listed firms, government and legal entities are the largest and dominant shareholders who play a highly controlling role within the firms. The largest shareholders own 46 percent of a firm on average while the second largest shareholder usually owns only 5 percent of a firm on average (Xu, 2004). Following an introduction of the market-oriented economy in China, traditional Chinese firms have been modernised into publicly-listed firms. Given the separation of ownership and control, managers are entitled to a greater discretion in making decisions within the firms. Consequently, it is the largest shareholders who have the greatest incentive to monitor managers' behaviour, as the cost of such monitoring would be far beyond the level other shareholders are willing to tolerate. The implication is that there exists a varying nature of objective between different shareholders in a firm. This leads us to predict that different types of firms are likely to operate different incentive schemes in an attempt to induce their managers to act properly. We document that about 78.79 percent of total listed firms are controlled by holders of state shares or legal entity shares, while only 21.21

³ China has experienced planned economy, during which period all of the firms were under the state control and given no autonomy. Even after listing on stock exchanges, ownership structure was still highly concentrated.

percent are owned by individuals or private organizations. Compared to the corresponding literature from developed countries (Core et al, 1999), we expect that ownership structure has the potential to influence managerial compensation in Chinese firms. After controlling for other firm and industry characteristics that may influence managerial compensation we find that manager pay is higher and pay-performance relation is more significant when a firm is private-controlled than is state-controlled. For example, if firms are controlled by private shareholders, the measurement for stock market performance has a greater impact on manager compensation, compared to the case when firms are controlled by non-private shareholders. Our regression results also reveal that compared to firms without foreign ownership, top executives in firms with foreign ownership are more highly compensated. Some of the prior research on Chinese managerial compensation argued that state-controlled firms often operate inefficiently and place little emphasis on pay-performance scheme (Firth et al, 2006). In contrast, we find that when the ultimate controlling shareholder is the central government, there is a significant relation between manager compensation and firm-related variables such as accounting performance, stock market performance and corporate value.

The rest of the paper proceeds as follows. Section 2 reviews prior literature relevant to this study while Section 3 describes the institutional background and hypotheses. Section 4 presents the data and methodology. The empirical results are discussed in Section 5 and Section 6 concludes.

2 Literature review

From the early 1980s, a large literature has accumulated on the study of managerial compensation. A managerial compensation is considered as an incentive mechanism offered by shareholders to management in an attempt to align their interests and solve the principal-agency problem (Jensen and Meckling, 1976; Jensen and Murphy, 1990).

There is also a growing body of literature which examines the relationship between ownership structure and managerial compensation from several different perspectives. For example,

Mehran (1995) documents that firms with higher ownership concentration held by outside shareholders intend to use less equity-based compensation. Furthermore, Core et al (1999) provide evidence that the ownership concentration of Chief Executive Official (CEO) shareholdings or outside blockholders is a decreasing function of executive compensation. In addition, similar research has also been conducted in other economies, such as the UK (Conyon, 1997), Italy (Brunello et al, 2001), New Zealand (Gunasekaragea and Wilkinson, 2002), Norway and Sweden (Randoy and Nielsen, 2002), HongKong (Cheng and Firth, 2006) and Japan (Basu et al, 2007), they all document a positive relation between managerial compensation and firm performance.

Specifically, the separation of ownership and control which is known to cause agency problem raises further issues in managerial compensation research. Based on the agency theory, Murphy (1999) argues that the most effective mechanism to align the interests of managers to the interests of shareholders is to relate managers' compensation to firm performance. However, evidence in the prior literature is mixed. Most of the studies conducted in developed countries document a strong and positive relationship between firm performance and managerial compensation. For instance, Mehran (1995) focuses on the structure rather than the level of compensation and investigates the relationship with firm performance in the context of the firm's ownership structure and the composition of board of directors. He uses 153 randomly-selected manufacturing firms from 1979 to 1980 and finds that firm performance is positively related with managerial compensation. Using cash salary and bonus payments as a proxy for fixed compensation with a dataset of 452 U.S. industrial companies between 1984 and 1991, Berger et al (1997) suggest that CEOs' salary and bonus compensation has low sensitivity to changes in firm value. In contrast, examining a similar issue using Japanese stocks, Kato and Kubo (2006) find a significant relationship between CEOs pay and firm performance.

More recently, a few researches related to managerial compensation have been done in China. Kato and Long (2005) first document a significant relation between managerial compensation and

firm performance. Following Jensen and Murphy (1990), they suggest that a 1000 RMB increase in shareholder value of the firm induces a 0.053 RMB increase in CEO pay. Low pay-performance sensitivity has also been documented by Frith et al (2006) in China's listed firms. Examining the relation between ownership structure and managerial compensation, they find that pay-for-performance is insignificant in government and legal entity controlled firms. Moreover, Fan et al (2007) argue that politically-connected CEOs in newly and partially privatized firms have a negative effect on first-day stock return. They also argue that boards are composed of bureaucrat directors in the firms with politically-connected CEOs rather than directors with relevant professional background.

In light of the literature review above, much emphasis in the literature appears to be given to the discussion of the performance-based pay scheme for top management. Consequently, such performance-based remuneration scheme is argued to provide incentives for managers to work towards increasing the shareholder value of the firms (Firth et al, 2006). Nevertheless, little attention has been paid to the question of how managerial compensation and pay-performance are related to each other under the presence of heterogeneous ownership structure.

Most of listed firms in China show a strong preference for equity issue on the stock market as a mean to raise new capital, which is contrary to the expectations of the pecking order theory. Also, the majority of the listed firms in China are state-owned enterprises and the top executives in these firms are bureaucrats appointed by government, which explains a dominant and controlling role of government in management of such firms. Consistent with the foregoing discussion, executive compensations, including salary and bonus, in state-owned enterprises are found to be less sensitive to performance-based indicators (Yueh, 2004). Being the largest shareholders, government and legal entities can easily exert social responsibility on firms for issues other than profits maximization and pay the CEOs according to civil service pay scale. If individuals or private

organizations play a controlling role within the firm, they recommend that CEOs be paid based on firm performance.

However, the rapid economic growth and economic restructuring in China, especially following the participation in the World Trade Organization (WTO) since 2001, have contributed to the improvement of corporate governance and firm performance of many Chinese firms. Accordingly, this resulting economic environment is expected to influence on the determinants of managerial compensation in China. This paper will fill this gap by providing the study of how executive compensation relates to firm performance and is determined for publicly traded firms in China after accessing WTO, choosing a comparative new panel data from 2002 to 2005.

Similar with some prior studies (e.g. Firth et al, 2006; Chen et al, 2008), we dig deeper on the issue of the ownership structure and grouping of shareholder objectives. There are three main types of shares issued in Chinese firms: state shares, legal entity shares and common tradable shares. Following the legal breakdown of shares, it does not adequately observe different motivations of shareholders (Firth et al, 2006). In this paper, we re-categorize the state and legal entity shareholders. State shares are owned and under the direct control by central government bureaucratic agencies, such as national asset management department. Meanwhile, legal entity shares can further be divided into two types: state-owned legal entity shares owned by state-owned enterprises (SOEs) and social legal entity shares owned by other legal entities. It is noted that the SOEs are also under the partial control of central or local government. Therefore, it is expected that both state shareholders and state-owned legal entity shareholders share a common motivation (Sun et al, 2002). We choose to re-divide state shareholders and legal entities (legal breakdown) into ‘state-owned shareholders’ (including state bureaucratic agencies and SOEs) and ‘legal entity shareholders’ (referring to non-SOEs legal entities).

3 Institutional background and hypotheses

3.1 Institutional background

Ownership structure

Before 1978, when the ‘open-door and reform’ policy was firstly introduced, the economy was operating under absolute control of the central government, and the profits of firms were remitted and allocated by the central government. Beginning in 1978 and going on throughout afterwards, China has achieved a great economic growth and industrial sector has been reformed. The firms were no longer under the central government absolute control, and were given some market-oriented incentives. By this way, firms were allowed to retain some profits and decision making has been shifted from state level to firm level, and managers were awarded explicit monetary rewards based on firm’s performance (Groves et al, 1994). As the reform continuing, the central government was trying to relinquish its shareholdings and selling them to the public. However, during this period, the government was still keeping dominant role over majority firms (Kato and Long, 2005).⁴ This partial privatization of SOEs becomes the unique ownership characteristics in China, which were so different from other developed countries and transitional economies.

Since 1990, most traditional SOEs have implemented corporatization and privatization and have been listed on one of the two stock exchanges in Shanghai and Shenzhen. Those traditional SOEs often issued shares to the public in an attempt to raise new capital. All of shares issued by listed firms have been divided into two types, of which one third can be traded on the stock exchanges and held by individuals and private organizations, while the rest of the shares that can not be traded on the stock markets. These non-tradable shares are held by a group of bodies such as the government, SOEs agents and top executives, directors of boards and directors of supervisory of issuing firms, which make up to two thirds of total shares. This unique arrangement of share issues in China is called Share-split structure. However, the existing mechanism of share-split structure in turn creates some extent of conflicts between shareholders due to the presence of different rights

⁴ The state direct and indirect controlled firms account for about 78 percent of total listed firms.

between shareholders, which could result in profits of minority shareholders being invaded. By the end of 2004, approximately 714.9 billion shares have been issued with nearly 65 percent of these being non-tradable shares, 75 percent of which were held by the government and its bureaucratic agents.

Managerial compensation

Prior to the economic reforms, all of the Chinese firms were state-controlled. The managers in these firms, mostly bureaucrats, were paid according to the civil service pay scale. After 1978 when the economic reforms took place, the responsibilities of decision-making had been shifted from government level to the firm level. As a result, managers were given some degree of autonomy in operating the firms. However, the firms were still left to be controlled by government. Under this partial reform, managers still lacked motivation and incentive to work towards maximising profits of the firm as most of the managers were still bureaucrats and therefore continued to be paid according to the civil service pay scale (Groves et al, 1994).

The dilemma of providing a sufficient level of autonomy to management and simultaneously maintaining state control complicates the setting of managerial compensation. Before economic reform came into effect in China in 1978, all of the firms ran as representatives of the central government, especially in the sector of public services, such as the water and electricity supply industries. The managers of these firms were working as bureaucrats of the central government in contrast to their counterparts in other countries and they were paid in line with the civil service pay scale system. Accordingly, there were no strong incentives for them to work to maximise the firm's profits.

With the labour market reform during the early 1990s, a few significant changes have taken place. The enterprises have been awarded the discretion to recruit new employees and exercise the retention of profits (Clarke, 2003). Since 1992, listed firms were allowed to establish their own internal wage structures within the range of the wage budget set by the government, and

furthermore the pay for employees including top managers increased substantially. Subsequently, the introduction of a managerial compensation mechanism adopted from developed countries aimed to initiate profit-oriented incentives and relate manager remuneration to enterprise performance. During the period from 1995 to 1999, the sources of employee's annual income changed more diversely, and the wage structure reflected less seniority-based pay (Yueh, 2004). The pay for managers has been increasing constantly such that the average pay for top executives is RMB130.22 thousand, RMB208.10 thousand and RMB196.25 thousand in 2002, 2004 and 2005, respectively.

Managerial compensation mainly consists of four elements in developed countries; a basic salary, bonus, stock option and long-term incentives. However, under the condition of share-splits in China, manager rewards comprise a basic salary and short-term incentives, excluding stock option and long-term incentives. On one hand, managers are unlikely to agree with the offer of the stock options, as such option could not be exercised on secondary stock market therefore resulting in little benefits. On the other hand, based on the modern portfolio theory, once the managers receive the stock from the firm, they have to either sell them or exercise an equivalent portion of shares they already owned for diversification purposes (Ofek and Yermack, 2000). Also, the CEO turnover rate in China's listed firms is extremely high (Firth et al, 2002), which tends to adversely affect the effectiveness of a long-term incentives scheme. Consequently, very few firms granted stock options to CEOs and top management as a means to provide long-term incentives. Total compensation for managers in China consists merely of a basic fixed salary and short-term incentives, including bonuses, which are related to firm operation performance. However, listed firms are not required to disclose a full component of the managerial compensation in the annual report, which makes it difficult to examine the effect on each component in detail.

As different types of controlling shareholders aim to achieve different objectives⁵, managers in different firms are expected to be compensated differently. Naturally, it follows that firms are likely to adopt distinctly different incentive schemes as a way to monitor the behaviour of managers.

3.2 Hypotheses

In the modern publicly traded corporations, ownership is separated from control which raises the ‘principal-agent’ problem. Shareholders are viewed as the ‘principals’ of the firm, while managers are viewed as the ‘agents’ who make important financing, investment and product-market decisions with the capital funded from outsiders aiming to achieve the goal of maximising shareholders’ wealth. Given the separation of ownership and control, the ex-ante contract offered to managers are effective, while the ex-post behaviours are unobserved by shareholders and other stakeholders, which may raise the problem of moral hazard and adverse selection. To successfully induce managers to act in the best interest of shareholders, the pay for senior managers should be related to the outcomes that can be observed. Therefore, the most effective incentive mechanism to align the interests of management and shareholders is to make managers’ compensation a function of firm performance (Murphy, 1999). The majority of the research in this subject have found a positive and statistically significant pay-performance relation (e.g. Conyon, 1997; Core et al, 1999; Basu et al, 2007). However, the firms are not running as perfectly as the theory suggests, as some of the prior research has provided evidence of low pay-performance sensitivity (e.g. Jensen and Murphy, 1990; Randoy and Nielsen, 2002; Girma et al, 2007; Swan and Sung, 2008).

The economic reform introduced a modern management system into China’s companies. In particular, the China’s publicly-listed firms are becoming to fully follow world accounting and auditing standards and closely link their manager remunerations to firm performance in some extent. Under the principal-agent theory framework, we hypothesise that top manager pay is related with firm’s performance. This leads to the first hypothesis of this study:

⁵ State controlled and legal entity controlled firms have to satisfy their management bureaucrats, maintenance direct control on certain industries, recruit enough social employees and other social obligations (Clarke, 2003).

H1: There is a positive relationship between managerial compensation and firm performance.

One of the important motivations of this study relies on the presence of the unique ownership structure in China's listed firms. A primary feature of such ownership structure in China is that the largest shareholders predominantly direct and control firms' decision-making process, for example, they exercise a significant influence on firms' operations and management appointment. Based on Xu (2004) report, the largest shareholder owns 46 percent of a firm on average and the second largest shareholder owns only 5 percent of a firm on average. This suggests that the largest shareholders have a substantial control on the listed firms, which is quite different from the case in developed countries where the ownership is highly dispersed (Core et al, 1999).

According to the Corporation Law of China, all the shares issued are divided into three types: shares owned by the government, shares owned by legal entities and shares owned by individuals or private organizations. Each type of share issues accounts for almost one-third of total shares outstanding. Moreover, the shares owned by government and legal entities can not be traded on the stock exchanges, while only the shares owned by individuals or private organizations are tradable. Although legal entities can enjoy the benefit arising from the placement of autonomy to some degree, they are still subject to the ultimate control of the central government. Therefore, approximately 65 percent of total shares are non-tradable and this induces the problem of lack of outside investor protection. Researchers in prior studies of China (Firth et al, 2007) believe that the firms where the government and its bureaucratic agents are the ultimate shareholders place a greater weight on firm profitability when deciding the level of CEO pay. Further, they argue that such firms are not strongly motivated to connect the pay for managers to stock market performance, because these controlling shareholders can not fully benefit from the equity market appreciation. In addition, top executives in these firms are bureaucrats and appointed by the central government and therefore their remunerations are determined according to civil service pay scale to some extent.

However, there is an increasing number of firms that are controlled by individuals or private organizations in the Chinese stock markets. The managers of such privately-controlled firms are selected from the experienced candidates who possess sophisticated knowledge and expertise in relevant areas. A principal objective for managers in these firms is to work for firm profit maximizations. Managers in particular industries in China are always having expertise and professional knowledge and specific human capital causes them to act in the best interests of shareholders. Different from shares owned by government and legal entities, the shares owned by individuals or private organisations can be readily issued to the public and exercised. Consequently, the dominant shareholders in privately-controlled firms are interested in maximising both firm profits and stocks' market performance. Based on the foregoing discussion, we expect that firms having individuals or private organizations as the largest shareholders are likely to introduce performance-based pay scheme to motivate managers' performance.

Besides the high ownership concentration, another distinct ownership characteristic present in Chinese listed firms is that government or legal entity tend to be the largest shareholder of the listed firms in all industries, only minority of which is under the dominant control of individuals or private organizations. Subsequently, we expect the ownership structure of Chinese listed firms to have a substantial impact on executive pay. This leads us to present the following two hypotheses:

H2: The executive pay is higher for firms controlled by individuals or private organizations than for firms controlled by government or legal entities.

H3: The sensitivity of managerial compensation to firm performance is lower in government controlled firms.

Besides the shares owned by central government, legal entities and individuals, Chinese listed firm are also allowed by CSRC to issue shares to foreign investors.⁶ It is widely accepted that foreign shareholders place a stronger emphasis on firm performance and exert pressure on hiring

⁶ It is noted that the portion of shares issued to foreign investors accounts for only a tiny part of total shares outstanding.

high-qualified CEOs with international experience (La Porta et al, 1999). This professional ‘human capital’ naturally demands a higher pay. On one hand, in order to make foreign investors interested in buying shares, firms have an incentive to adopt international corporate governance so as to be consistent with the standards practised in developed countries. On the other hand, given the fact of information asymmetry between insiders and outsiders, foreign shareholders may prefer to relate managerial compensation to firm performance as the measurement for firms’ market performance is explicit and easily observable.

Examining the influence of foreign shareholders on top executive pay and pay-performance relation in China’s listed firms, Firth et al (2006) document that although the foreign shareholders do not play a substantially controlling role, the role of foreign shareholder can not be neglected.

H4: The executive pay is higher for firms which have issued foreign shares.

H5: The presence of foreign shareholder influences pay-performance sensitivity.

4 Methodology and Sample Data

4.1 Methodology

To examine the impact on managerial compensation of firm performance and ownership structure for the Chinese listed firms, both qualitative and quantitative methods are adopted in this study.

A quantitative method is conducted to test how firm performance is related to manager pay in China when ownership structure varies across firms. Applying a modified version of the linear model used in Core et al (1999),⁷ we test the sensitivity of the level of manager pay to firm performance and other control variables, including firm size and board of directors’ variables. Moreover, to examine the impact of foreign monitoring, we include a dummy variable to separately code firms with and without foreign ownership. To investigate the effect of ownership structure on

⁷ A very similar model was also used by Kato and Kubo (2006) and Firth et al (2006).

the pay-performance relation, we also form interaction variables. The regression model to be tested is as follow:

$$PAY_{it} = \beta_0 + \beta_1 PERF_{it-1} + \beta_2 SIZE_{it} + \beta_3 BOARD_{it} + \beta_4 POND_{it} + \beta_5 FOR + \beta_6 FOR * PERF_{it-1} + \gamma_1 Industry_i + \gamma_2 Year_t + \varepsilon_{it}$$

Where

Industry is the row vector based on SIC codes and Year is the column vector

PAY is the log of the average top three-executive compensation. *PERF* is the performance of the firm. To proxy for *PERF*, we use three different performance measures, return on assets (ROA) representing the accounting performance, annual stock return (RET) representing stock market performance and Tobin's Q (TOBIN) representing corporate value, and we regress them in equation respectively. *SIZE* is the log of the total assets of the firm. *BOARD* is the size of the board measured by the log of the number of directors of the firm. *POND* is the composition of the board measured by the number of non-executive directors divided by the total number of directors of the board. *FOR* is a dummy variable coded one if the firm has foreign shareholders and zero otherwise. A prior literature suggests that the ownership structures tend to be interrelated with firm performance. To test whether such interaction significantly affects executive compensation, we include an interaction variable *FOR·PERF*. In addition to the coefficients of β_1 to β_6 are row vectors of relevant coefficients. *Industry* is a column vector of industry dummy based on SIC codes. *Year* is a column vector of yearly dummy.

Table 1 provides definitions and symbols of variables included in our regression model. The choice of variables is explained below:

From the theoretical framework perspective, almost all of prior studies conducted in developed countries have provided a positive relation between pay and firm performance (Canyon, 1997; Core et al, 1999; Kato and Kubo, 2006). The performance-related pay has also been conducted for China's listed firms. In this study, we expect firm performance to be one of major determinants of the managerial compensation. We employ three measurements for firm

performance. They are return on assets (ROA) which is a proxy for accounting measurement of firm performance, annual stock return for stock market performance, and Tobin's Q for corporate value performance. The measurement of ROA is computed as net income divided by total assets. It is an accounting indicator which conveys information on firm profitability to shareholders and boards of directors and signals how efficiently management allocates and utilises shareholders' resources in generating earnings. Therefore, it is considered as one of crucial determinants of managerial compensation (Jensen and Murphy, 1990). Firth et al (2006) argue that stock return is sufficiently efficient measure of a firm's performance. Both ROA and stock return have been used to proxy for firm performance in other studies (Kato and Kubo, 2006 and Cheng, 2008 for ROA, Core et al, 1999; Brick et al, 2006 and Firth et al, 2006 for stock return). Tobin's Q has been widely used as a proxy of firm performance to measure corporate value (Mehran, 1995; Bhagat and Bolton, 2008). Consistent with prior researches, we choose ROA, stock return and Tobin's Q as dependent variables. To reflect the causal relation between CEO pay and corporate performance, we use lagged firm performance of prior year in the regression model.

Table 1
Variable definitions

Variables	Symbol	Definition
<i>Compensation</i>		
Managerial compensation	PAY	Log of top three executives total pay divided by three
<i>Firm performance</i>		
Return on assets	ROA	Net income/total assets
Stock return	RET	Annual stock return
Tobin's Q	TOBIN	Market value/replacement value
<i>Firm characteristics</i>		
Firm size	SIZE	Log of total assets
Board size	BOARD	Total number of directors on the board
Board composition	POND	Percentage of independent directors
<i>Ownership structure</i>		
Foreign share ownership	FOR	Equal to 1 if the firm has foreign shareholders (B and H)
<i>Other variables</i>		
Industry ¹	IND	Equal to 1 for the specific industry
Year ²	YEAR	Equal to 1 for the specific year

We exclude financial institutions in our sample.

^{1, 2} To avoid dummy variable trap, we use 11 industry dummy variables to represent 12 industries in our sample, these industries are agricultural mining, manufacturing, electricity, gas and water supply, construction, transportation, technology, commercial, property, public service and communication; we also use 3 year dummy variables to represent four years in our sample, covering from 2002 to 2005.

For the selection of control variables, a vast body of literature suggests that the relation between firm size and managerial compensation is significantly positive (Jones and Kato, 1996; Conyon, 1997; Firth et al, 1999; Hermalin and Wallace, 2001; Chalmers et al, 2006; Girma et al, 2007). We believe that firm size is an important determinant of managerial compensation in China. Other control variables are chosen to consider the impact of board of directors on managerial compensation. Prior studies suggest that a large board makes decision-making procedures more complicated and less effective. The implication is that such corporate environment may allow managers to expropriate shareholder value (Cheng, 2008). Therefore, we expect board size to be one of the factors that determine managerial compensation and use the number of directors on the board as a measurement of board size. We further consider the effect of independent directors and compute the variables as the number of independent directors divided by total number of directors on the board.

As discussed in the section of literature review, the largest shareholder has the potential and substantial impact on pay for managers and different dominant shareholders tend to prefer different incentive pay schemes. One of the main reasons discussed was that the shares they owned grant different rights, for example, the state and legal entity shares can not be traded on stock exchanges. Individually-owned firms were considered to be one of the kinds that were likely to be attracted to performance based incentive schemes. To examine the impact of ownership structure on CEO pay and pay-performance relation in different types of firms, we divide our total sample into three sub-samples; the case in which controlling shareholders are state-owned shareholders, legal entity shareholders and individual shareholders, respectively.⁸ We run the regression model for each of the three sub-samples. Furthermore, to test whether foreign shareholders have a preference for

⁸ Definitions and categorisation of different types of shareholders were discussed in Section 3.

performance-based pay schemes, we include a dummy variable *FOR* and interaction term *FOR·PERF*.

From SinoFin database, we obtain the information relate to compensation for top three executives in China's listed firms. From 1998, all of listed firms in China were asked to disclose the level of payment for senior managers, board of directors and supervisory members in their annual report. However, the information disclosed by the firms is limited to total payment for top executives which include salary, bonus and other income. Therefore, a complete information on the components of total compensation was not obtainable. Given payment information obtained, we use the log of top three executive total pay divided by three as a measurement of managerial compensation, *PAY*.

4.2 Sample Data

We start with all firms listed on the Shanghai Stock Exchange and Shenzhen Stock Exchange from 2002 to 2005⁹ and then tailor the population into our sample. First, from the total listed firms, we eliminate financial firms, which is consistent with previous literature for the special firm consideration for regulated industries. Secondly, we exclude all the observations that do not have a complete record on the variables in our analysis and also those firms that have missing data in the fields required regularly in the calculations of the measurements used in our analysis. Thirdly, we delete PT and ST companies, as the inclusion of these firms may bias results of the research. Therefore, the designated sample in our research consists of 1119 firms, and 4502 firm-year observations covering 2002 to 2005. In this study, all the financial and accounting data are obtained from the firms' annual reports and some authoritative database, such as CSMAR and SinoFin. The other data on the ownership structure and executive compensation is assembled from SinoFin.

⁹ The reason we choose this period is that on one hand from 2001 on, all of listed firms have disclosed their complete managerial compensation information on their annual reports, and new international auditing and accounting standard have been adopted. On the other hand, the data for 2006 and 2007 are extremely unstable and this will bias the results.

There are some reasons for the selection of the sample period. First, although from 1998, some of listed firms in China have begun to disclose remunerations for top executives in their annual reports, this only makes up minority of total listed firms and therefore could not represent China's stock market. However, since 2001 almost all of listed firms, covering all industries, disclose their pay for managers in their annual reports. Secondly, many of the listed firms in China began to adopt international auditing and accounting standards which resulted in firms' auditing section departing from their parent company after 2001. Lastly, the corporate restructuring process has entered into a new era with a rapid development after joining WTO, and the use of more recent data depicts more accurately the impact of the current reform of corporate governance quality on compensating management in transition economy. Moreover, after a careful examination of the data, we find that the data for 2006 and 2007 are unstable, for example, the average pay for top executives has jumped ten times or even more from 2005 to 2006 then to 2007. For this reason, we exclude this period in order to keep a relative stable data series.

4.3 Statistics Description

Table 2 presents descriptive statistics for managerial compensation, firm performance, ownership structure, board characteristics and firm characteristics of the total sample. The results indicate a steady increase in managerial compensation across the sample periods, with mean of RMB130.22 thousand in 2002, RMB168.45 thousand in 2003, RMB208.10 thousand in 2004, to RMB196.25 thousand in 2005. The overall pay levels range from RMB6.6 thousand to RMB1575.31 thousand, RMB7.6 thousand to RMB1628.23 thousand, RMB10.3 thousand to RMB1716.67 thousand, RMB10 thousand to RMB4443.47 thousand in 2002, 2003, 2004, 2005 respectively. The pay level in China appears much lower compared with its counterpart in some developed countries. The pattern observed in descriptive statistics of the compensation based on ownership structure is consistent with our hypotheses. The mean pay for managers is RMB108.68 thousand for the firms where the government is the dominant shareholder, while it is RMB110.58

for individually-controlled firms and RMB104.45 for firms controlled by legal entity shareholders.

Further, for firms with foreign shareholders, the mean of pay level is RMB162.42.

Table 2
Descriptive statistics

Variables	Year	Mean	Max	Min	Std. Dev.
<i>Compensation</i>					
Average pay (000s RMB)	2002	130.22	1575.31	6.6	121.71
	2003	168.45	1628.23	7.6	149.10
	2004	208.10	1716.67	10.3	190.74
	2005	196.25	4443.47	10.0	211.18
<i>Firm performance</i>					
ROA % (Return on assets)	2002	2.91	20.40	-33.84	4.28
	2003	2.80	20.97	-22.26	4.38
	2004	1.60	31.42	-132.95	8.80
	2005	0.61	22.13	-168.26	11.68
RET % (Stock return)	2002	-19.60	72.86	-60.7	16.50
	2003	-10.44	129.57	-82.58	27.67
	2004	-14.11	95.96	-90.93	23.78
	2005	-14.59	175.30	-74.42	25.45
TOBIN (Tobin's Q value)	2002	1.24	23.44	0.38	0.99
	2003	1.10	33.40	0.37	1.12
	2004	1.00	31.93	0.33	1.20
	2005	0.84	12.89	0.23	0.45
<i>Firm characteristics^a</i>					
Assets (million)		4030	719000	27.30	17700
BOARD (number of directors)		9.77	23	2	2.20
POND		3.12	10	0	0.94
<i>Compensation based on ownership^b</i>					
GOV (000s RMB)		507.84	13300	15.32	525.39
PRI (000s RMB)		506.49	5121.17	20.00	530.03
SLE (000s RMB)		467.16	2222.70	50.00	395.07
FOR (000s RMB)		857.15	13300	56.00	995.33
<i>Ownership structure^c</i>					
GOV (government shares)		75.39%			
GOV (state control)		21.86%			
GOV (SOE control)		55.5%			
PRI (private shares)		21.21%			
SLE (legal entity shares)		3.40%			
FOR (foreign shares)		8.97%			

GOV represents state-controlled firms, and PRI represents private-controlled firms and SLE represents legal-entity controlled firms. FOR represents the firms with foreign shareholders.

RMB is China's currency. Logarithm is applied here for all value variables in regressions.

^{a b c} The valuables in the categories of firm characteristics, compensation and ownership structure are represented as the average of four years from 2002 to 2005.

Firm performance statistics show that means of return on assets (ROA) are 2.91%, 2.80%, 1.60% and 0.61% in 2002, 2003, 2004 and 2005, respectively. The means of stock return (RET) are -19.60%, -10.44%, -14.11% and -14.59 for 2002, 2003, 2004 and 2005, with ranges from -90.93% to 175.30% per annum. The means of Tobin's Q (TOBIN) are 1.24 in 2002, 1.10 in 2003, 1.00 in 2004 and 0.84 in 2005. Consistent with evidence shown in prior work on China's stock market, the behaviour of measurements for accounting performance and firm value is comparatively modest over the periods while that of the stock market performance varies dramatically. The results suggest that differing measurements may convey different aspects of the firm performance. Stock return (RET) is to reflect shareholders' expectation about firms' future profitability therefore is forward looking, while return on assets (ROA) is rather used to measure firm profitability as a historical record. For the Tobin's Q value, it has been widely accepted as a measurement of firm value.

We also distinguish China's listed firms into three separate groups based on the type of dominant shareholders and they are firms where the largest shareholder is the government, individual or private organization and social legal entities, respectively. The government is the dominant shareholder in 75.39 percent of listed firms, individual or private organization is the dominant shareholder in 21.21 percent of listed firms, and 3.40 percent of listed firms are under the ultimate control of social legal entity shares. Table 3 provides the descriptive statistics of variables in three sub-samples. Also, we document that 8.97 percent of the firms included in our total sample have issued foreign shares (B shares and H shares).

Table 3
Descriptive statistics of subsamples

	Mean			Max			Min		
	GOV	PRI	SLE	GOV	PRI	SLE	GOV	PRI	SLE
PAY (thousand RMB)	507.84	506.49	467.16	13300	5121.17	2222.70	15.32	20.00	50.00
ROA (%)	2.76	1.26	3.06	44.44	26.35	46.31	-135.12	-168.26	-34.4
RET (%)	36.06	47.57	27.29	849.72	1611.8	558.43	-86.69	-90.93	-52.32

TOBIN	1.11	1.32	1.17	11.07	23.44	5.87	-2.37	0.33	0.52
SIZE (million)	4740	2040	2240	719000	39200	10600	122	27.3	255
BOARD	9.98	9.18	9.4	21	23	20	2	4	5
POND	0.32	0.34	0.33	0.6	0.75	0.56	0	0	0.11
observations	3394	955	153	3394	955	153	3394	955	153

PAY is the average pay of top three executives. ROA is return on assets. RET is stock return at the end of certain fiscal year. TOBIN is Tobin's Q representing firm value. SIZE is the firm total assets. BOARD is the total number of directors on the board. POND is the proportion of independent director on the board. GOV, PRI and SLE stand for controlling shareholders of government, private and legal entity respectively.

5 Empirical results

We first observe correlations between each pair of independent variables to examine the presence of multicollinearity. Correlation matrix for all variables used in this study is presented in Table 4. for all pairs of the variables, the magnitude of correlations does not exceed 0.27 and therefore, the relations between variables appear small.

Table 4
Correlation matrix between all variables (SIZE is measured by the log of total assets)

	ROA	RET	Tobin	SIZE	BOARD	POND
ROA	1					
RET	0.27	1				
Tobin	-0.04	0.12	1			
SIZE	0.16	0.23	-0.25	1		
BOARD	0.03	0.05	-0.08	0.19	1	
POND	-0.07	0.15	-0.30	0.13	-0.04	1

ROA is return on assets. RET is stock return at the end of certain fiscal year. TOBIN is Tobin's Q representing firm value. SIZE is the log of firm total assets. BOARD is the total number of directors on the board. POND is the proportion of independent director on the board.

Table 5 provides the results of the regression analysis. We estimate the regression model for each of three sub-samples and each sub-sample represents a group of firms with a relevant controlling shareholder.¹⁰ For each sub-sample, three regressions are estimated; the first uses return on assets (*ROA*), the second uses stock return (*RET*) and the third uses Tobin's Q as a firms

¹⁰ In the regression of each sub-sample, we delete outliers and incorrect data.

performance measure. The results are shown in the second, third and fourth columns in Table 5, respectively.

The results show that firm performance is positively related with managerial compensation in government-controlled firms using all of the three *PERF* measurements: ROA_{t-1} , RET_{t-1} and Tobin's Q_{t-1} (See Panel A). The relation is also significantly positive for firms controlled by social legal-entity when *PERF* is measured by ROA_{t-1} (See Panel B) and for privately-controlled firms when *PERF* is measured by ROA_{t-1} and RET_{t-1} (See Panel C). The results are statistically significant at the 5 percent level at minimum. This results support our hypothesis 1 that managerial compensation is positively related with firm performance. Most of extant studies on China's listed firms provided evidence that state-controlled firms were running with low efficiency and tended not to apply performance-based pay scheme for top executives (Firth et al, 2006, 2007). Contrary to the evidence found in prior studies but consistent with hypothesis 1, our results support that managerial compensation is positively related with firm performance. Using a relatively new panel data, it is found that for government-controlled firms (Panel A), there is a significantly positive relation between CEO pan and firm performance (*PERF*) regardless of the choice of the measurement for *PERF*. For firms controlled by legal entity (Panel B), the largest shareholders appear to adopt accounting performance-based incentive scheme in CEO payment settings. For privately-controlled firms (Panel C), a significantly positive relation between CEO pay and lagged stock return (in addition to ROA) is documented, which is contrast to evidence found in other studies in China (Firth et al, 2007).¹¹

Table 5
Regression of compensation on firm performance, ownership structure and firm characteristics

Dependent variables (measurement)	Average Pay	Average Pay	Average Pay
	ROA	RET	TOBIN
<i>Panel A: regression on the sample of GOV</i>			
Intercept	6.49*** (11.61)	5.93*** (10.16)	5.25*** (8.97)
PERF (ROA_{t-1})	2.02*** (6.83)		
PERF (RET_{t-1})		0.14** (2.80)	

¹¹ The prior studies showed no relation between CEO pay and lagged firm performance (measured by stock return) with the sample of China's listed firms ranging from 1998 to 2000.

PERF (TOBIN _{t-1})			0.20*** (3.44)
<i>Firm characteristics</i>			
SIZE	0.25*** (9.70)	0.28*** (10.35)	0.30*** (11.31)
BOARD	0.01 (0.04)	0.01 (0.13)	0.01 (0.15)
POND	0.31 (1.38)	0.27 (1.17)	0.29 (1.28)
<i>Ownership structure</i>			
FOR	0.31*** (3.65)	0.29*** (3.51)	0.28** (1.95)
FOR*PERF	0.27 (0.32)	-0.22* (-1.78)	0.01 (0.01)
<i>Other variables</i>			
Industry	Included	Included	Included
Year	Included	Included	Included
Adjusted R ²	0.23	0.21	0.21
observation	3394	3394	3394
<i>Panel B: regression on the sample of SLE</i>			
Intercept	9.04** (2.52)	8.43** (2.17)	9.01** (2.15)
PERF (ROA _{t-1})	4.26** (2.39)		
PERF (RET _{t-1})		0.41 (1.18)	
PERF (TOBIN _{t-1})			0.09 (0.36)
<i>Firm characteristics</i>			
SIZE	0.09 (0.60)	0.11 (0.69)	0.09 (0.50)
BOARD	0.10 (0.20)	0.01 (0.25)	-0.04 (-0.56)
POND	2.08 (1.03)	2.89 (1.32)	3.04 (1.43)
<i>Ownership structure</i>			
FOR	-0.10 (-0.04)	0.50 (0.35)	-1.17 (-0.17)
FOR*PERF	13.76 (0.25)	1.31 (0.11)	1.55 (0.23)
<i>Other variables</i>			
Industry	Included	Included	Included
Year	Included	Included	Included
Adjusted R ²	0.48	0.44	0.42
observation	153	153	153
<i>Panel C: regression on the sample of PRI</i>			
Intercept	5.93*** (5.08)	5.74*** (4.75)	5.36*** (4.42)
PERF (ROA _{t-1})	0.97** (1.97)		
PERF (RET _{t-1})		0.37** (2.71)	
PERF (TOBIN _{t-1})			0.03 (0.32)
<i>Firm characteristics</i>			
SIZE	0.25*** (4.66)	0.27*** (4.83)	0.28*** (5.15)
BOARD	0.02 (0.94)	0.02 (0.80)	0.02 (0.93)
POND	0.64 (0.79)	0.55 (0.66)	0.62 (0.76)
<i>Ownership structure</i>			
FOR	0.63** (2.60)	0.38 (1.36)	0.77 (0.75)
FOR*PERF	1.43 (0.58)	-1.71** (-2.00)	-0.16 (-0.16)
<i>Other variables</i>			
Industry	Included	Included	Included
Year	Included	Included	Included
Adjusted R ²	0.25	0.25	0.24
observation	955	955	955

Managerial compensation is the log of the Average Pay. PERF are measured by ROA, stock return and Tobin's Q in the regressions, respectively. SIZE is the log of total assets. BOARD is the total number of directors on the board. POND is the proportion of independent director on the board. FOR is the dummy variable and values 1 when the firm has foreign

investor. We include Industry and Year dummy variables to control the industry and time effects. GOV, SLE and PRI stand for controlling shareholders of government, private and legal entity respectively. T-statistics are in parentheses, computed using the White (1980) heteroskedasticity consistent standard error. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

The purpose of dividing the total sample into three sub-samples is to investigate whether the behaviour of performance-pay relation for CEO compensation differs across firms with different ownership structure. As discussed, the coefficients of *PERF* in Panel A (where the firms are government-controlled) are positive and significant using all the three measurements of *PERF*. This result indicates that government-controlled firms advocate managers' pay based on firm performance. Some of prior research argued that the shares held by the largest shareholders in state-controlled firms can not be traded on the secondary market therefore hardly gaining from any share price increases. It follows that the largest shareholders in state-controlled firms tend to place less focus on stock market performance and the prior results show no significant relation between stock return and CEO pay as in Firth et al (2007). However, it is noted that Firth et al (2007) examine the sample period from 1998 to 2000, which precedes our sample period. Studying the sample period from 2002 to 2005, the empirical results in this study suggest that firms' market performance does have a significant impact on the determination of CEO remuneration in recent period in China.

In Panel C (where the firms are private-controlled), the coefficients for *PERF* is positive and significant when *PERF* is measured by ROA_{t-1} and RET_{t-1} , and insignificant when is measured by $TOBIN_{t-1}$. Unlike government-controlled firms, the shares in the hands of the largest shareholders in privately-controlled firms can be easily traded on stock exchanges and consequently the stockholders can benefit from share price increases. This result in Panel C suggests that CEO compensation in privately-controlled firms is more sensitive to corporate profitability as well as to stock market performance. In Panel B (where the firms are legal entity-controlled), the coefficients of *PERF* are significant when *PERF* is measured by ROA_{t-1} , and insignificant when is proxied by RET_{t-1} and $TOBIN_{t-1}$. This indicates that CEO compensation in legal entity-controlled firms are most responsive to firm's accounting performance.

The coefficients of RET_{t-1} in private-controlled firms are larger than that in government-controlled firms and legal entity-controlled firms. For example, in Panel C, the privately-controlled firms have a higher $PERF$ coefficient of 0.37 compared to those of other firms (0.14 for state-controlled firms and insignificant coefficient for legal entity-controlled firms). This results support our hypotheses 2 and 3 that pay-performance sensitivity in privately-controlled firms is higher than that in government-controlled and legal entity-controlled firms. It also indicates that private blockholders put much more weight than other stake owners on firm stock performance recently, and this provides adequate incentives for managers. However, in terms of ROA_{t-1} and $TOBIN_{t-1}$, government-controlled firms have both higher and significant coefficients than other firms.

The dummy variable, FOR has positive coefficients in Panel A and Panel C, and panel B when firm performance is measured by RET_{t-1} . This provides evidence for hypothesis 4 that foreign-invested firms pay their managers much more higher compared with non-foreign-invested firms. The interaction terms $FOR*PERF$ are positive when firms are legal-entity controlled (Panel B), while mixed in Panel A and Panel C. $FOR*RET_{t-1}$ has a negative and significant coefficient in Panel A and Panel C. This gives evidence for hypothesis 5 that foreign-invested firms put more weight on stock market behaviour. As we argued above, in China the largest shareholders are always holding a large proportion of total share and acting the dominant roles in firm operation. Consequently, foreign investors feel less reliable and would like to put rigorous pressure on CEOs. This provides support that the presence of foreign investors is more efficient and focusing on stock market performance, in order to avoid from expropriating shareholder value. This also indicates that foreign investors are powerful enough to influence the pay-performance relation.

As we expect, firm size, $SIZE$ (measured by log of firm total assets), is positively and significantly associated with managerial compensation. This is consistent with the findings in other studies (Conyon, 1997; Core et al, 1999; Firth et al, 2006) that state managing large firms need more skill and experience. Across the three sub-samples, the coefficients for the total number of

directors on board, *BOARD*, and the proportion of independent director on the board, *POND*, are found to be insignificant. Since 2001, it is required for all of listed firms in China that at least one-third of the board members are independent directors. This might make firms including independent directors to meet the stipulation need rather than moderate the problem of internal control (Clarke, 2003).

To control for firm-level variables that might be correlated with time, the regression model are re-estimated on a yearly basis. The results are similar to those shown in Table 5, indicating a significant influence of ownership structure on managerial compensation over this period. To be consistent with the method used in other researches from developed countries, the regression models are re-run by regressing CEO pay on current firm performance measurements and lagged firm size. Inconsistent with the results found in developed countries, we do not find any significant association between CEO pay and current company performance, which was either measured by ROA, stock return or Tobin's Q. We conjecture that this discrepancy in results may be attributable to the difference in payment mechanisms among countries. Most countries, including China, apply 'yearly salary system' on CEO compensation, so the payment for current year is always decided based on firm performance in the prior year. The regression models are also re-estimated using lagged firm size. The results are broadly similar to those shown in table 5 therefore are not reported.

6 Conclusion

Accessing to WTO accelerates China's economic reform and corporate restructuring process. The corporate governance including remuneration mechanism has substantially changed (Yueh, 2004) for China's listed firms. From 2002 onward, all of the listed firms were required by rule to disclose the information on their managerial compensation. We take this advantage to collect data and examine the determinants of managerial compensation and how close it is to firm performance.

The central question of this study is whether managerial compensation is related to firm performance and how this relation is in different types of firms. China is carrying out economic reform and transforming SOEs into modern profitable firms, how managers are compensated can be viewed as the indicator of the success of reform and in turn the quality of corporate governance (Firth et al, 2006). Therefore, it is important to set the managerial compensation properly. We examine the pay-performance relation in more detailed. We partition the total sample on the basis of controlling shareholders and find a positive and significant relation between CEO pay and lagged firm performance in state-controlled firms, legal entity-controlled firms and private-controlled firms. Moreover, different measurements of firm performance give different incentives to managers.

The empirical results also provide evidence that ownership structure has a significant influence on executive pay and pay-performance relation. Managers are compensated higher in privately-controlled firms in term of stock market performance. The compensation is promoted in government-controlled firms based on accounting measure of performance. The presence of foreign shareholder is associated with higher CEO pay. This is also consistent with our hypothesis that foreign investors and private shareholders prefer to push firms to adopt performance-related pay for managers. Moreover, in different types of firms, foreign-investors prefer incentive pay schemes to relate with different firm performances.

Firm size is positively and significantly related to managerial compensation as we expect. This result is consistent with most of other researches (e.g. Conyon, 1997; Core et al, 1999; Firth et al, 2006). However, we can not find any statistically significant evidence of the influence from board size and independent directors.

One of the limitations is that data availability compared with research in developed countries. Though the listed firms started to disclose information of managerial compensation in their annual reports, they are total compensation for managers without any breakdown into components (such as salary and bonuses). As salary is basic and fixed payment and bonus is related with firm

performance, so it is difficult to tell how much bonuses are included in the total compensation and whether they are paid according to firm performance. Another problem we face is that CEO pay is not given out directly. We can just obtain the data of total compensation of top three executives, and we assume CEOs are paid highest. We use the log of average pay level of top three executives as the proxy of managerial compensation in this research.

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