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**Executive Compensation, Firm Performance, and Corporate Governance in China:
Evidence from Firms Listed in the Shanghai and Shenzhen Stock Exchanges***

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Abstract

This paper provides evidence on how executive compensation relates to firm performance in listed firms in China. Using comprehensive financial and accounting data on China's listed firms from 1998 to 2002, augmented by unique data on executive compensation, ownership structure and board characteristics, we find for the first time statistically significant sensitivities and elasticities of annual cash compensation (salary and bonus) for top executives with respect to shareholder value in China. In addition, sales growth is shown to be significantly linked to executive compensation and that Chinese executives are penalized for making negative profit although they are neither penalized for declining profit nor rewarded for rising profit insofar as it is positive. Perhaps more importantly, we find that ownership structure of China's listed firms has important effects on pay-performance link in these firms: (i) state ownership of China's listed firms is weakening pay-performance link for top managers and thus possibly making China's listed firms less effective in solving the agency problem; (ii) such effects exist for both direct government ownership through state shares and indirect government ownership through legal person shares and indirect ownership of listed firms by the state may weaken pay-performance link more than direct state ownership; and (iii) corporate governance reform measures such as the promotion of independent directorship and the separation of the CEO position from the board chairmanship are ineffective in making pay-performance link stronger. As such, ownership restructuring may be needed for China to successfully transform its SOEs to efficient modernized corporations and reform its overall economy.

Keywords: executive compensation, firm performance, corporate governance, ownership structure, China, and transition economies.

JEL Categorization: P31, P34, O16, G30, O53, M12, M52, G15, J33

Executive Compensation, Firm Performance, and Corporate Governance in China: Evidence from Firms Listed in the Shanghai and Shenzhen Stock Exchanges

I. Introduction

Executive compensation has attracted much attention from economists in the past two decades yet most academic work on executive compensation has been concentrated on a few developed countries such as the U.S. and the U.K., mainly due to data availability.¹ In light of the mounting interest in the arguably vital role that corporate governance may play in economic development, however, it is of considerable importance to study how firms in developing countries compensate their top executives.² In particular, for transition economies struggling to transform their state-owned enterprises (SOEs) into profitable modern firms through various reform measures, the provision of efficient managerial incentive contracts is a crucial ingredient of the successful transition of the economy.³ Since executive pay-performance link represents the bulk of managerial incentives for top management, a closer look at the nature of pay-performance link for top management in transitional economies will provide much needed information for the evaluation of the current reform effort and the designing of future reform measures.

Aided by two newly available data sets, in this paper we study the nature of pay-performance link for top management in a group of firms from the largest transition economy in the world, China. These are firms listed in China's two thriving stock exchanges, the Shanghai Stock Exchange and the Shenzhen Stock Exchange. Since firms aspiring to become listed are required to go through corporate restructuring according to the western-styled Corporate Law of 1993 and listed firms are under increasing pressure to adopt certain good corporate structure practices (such as the inclusion of independent directors in the board and the separation of the board chairmanship and the CEO position), the process of getting listed

¹ See, for example, Murphy (1999) for an excellent survey of the largely empirical literature on top management incentives; and Gibbons and Waldman (1999) for the mostly theoretical literature. For an authoritative survey of earlier work, see Rosen (1990) who concludes his survey by urging scholars to broaden their inquiry beyond the U.S. to other countries. For an excellent survey of the corporate governance literature in general, see for instance Shleifer and Vishny (1997).

² Bai et al. (2003) finds evidence that listed firms in China with better corporate governance measures are associated with higher stock market valuation. Furthermore, the premiums related to better corporate governance are found to be substantially higher than those in other emerging markets in the world. Corporate governance appears to matter in China. For similar studies on other developing and transitional economies, see, for instance, Black (2001), Klapper and Love (2002), and Black, Hasung and Kim (2003).

³ Aghion, Blanchard, and Burgess (1994) stress the importance of managerial incentive reform in the successful economic transition of former socialist economies.

has the potential of enhancing the quality of corporate governance in these firms. This may explain why getting listed on the stock market has been trumpeted as a major vehicle for China's SOE reform in recent years.

On the other hand, although privately controlled firms have gradually increased their presence, the majority of listed firms on the Chinese stock market are still controlled by the government. In other words, the ownership structure of most listed firms in China is still dominated by government shares, which casts doubt on the effectiveness of the corporate restructuring process (or *GongSi GaiZhi* in Chinese). In order to draw some conclusions about China's success in her use of stock market listing as a vehicle for SOE reform, we explore how these firms relate their executive compensation to their firm performance and how such relationships are influenced by their ownership structure as well as their board characteristics.

Specifically, we find statistically significant sensitivities and elasticities of annual cash compensation (salary and bonus) for top executives with respect to shareholder value in China's listed firms. The size of the estimated sensitivities imply that a 1000 RMB increase in shareholder value yields a 0.053 RMB increase in annual cash compensation, whereas the size of the estimated elasticities suggest that a 10 percent increase in shareholder value results in 3.6 percent increase in annual cash compensation for top executives. We also find that sales growth is significantly linked to executive compensation and that Chinese executives are penalized for making negative profit although they are neither penalized for declining profit nor rewarded for rising profit insofar as it is positive.

Perhaps more importantly, the strength of the link between compensation and performance varies across firms with different ownership structure. Our findings suggest that private ownership and control of listed firms in China enhance the link between firm performance and executive compensation, while government ownership weakens executive pay-performance link and thus makes the firms less effective in solving the agency problem between their shareholders and management. Furthermore, such adverse effects on corporate governance of state ownership exist for both direct government ownership through state shares and indirect state ownership via legal person shares, and indirect state ownership may be a

greater hindrance to the development of pay-performance link for top management than direct state ownership.

On the other hand, piecemeal corporate governance reform measures, such as the promotion of the appointment of “independent” directors to the board of directors and the separation of the CEO position from the board chairmanship have proven to be ineffective in improving corporate governance and making pay-performance link stronger.

These results suggest that the interests of top executives in firms that are less state-controlled are more in line with those of the shareholders and thus these companies operate more like firms in the West. This is consistent with the belief that the piecemeal enterprise reform measures adopted in China will need to be supplemented by changes in ownership structure in order to ensure the successful transformation of SOEs into profitable modern corporations.⁴ As such, China may be in great need for ownership restructuring to fully succeed in transforming its SOEs to efficient modernized corporations as well as its overall economic transition, and such ownership restructuring ought to be a wholesale conversion of state shares to public shares (shares owned by private individuals or private firms including foreign investors).

Finally, to our knowledge, this paper is the first to look at pay-performance sensitivities and elasticities for listed firms in China. Systematic research outside the U.S. on executive compensation is still in its infancy, especially in emerging markets, mostly due to the limited data availability. Our study fills this important gap in the executive compensation literature.⁵ Specifically, previous studies on pay-performance linkage in China focused on SOEs before the stock market era and found positive and significant link of accounting performance measures to executive compensation (Groves et al., 1995, and

⁴ For the inefficacy of China’s piecemeal approach to economic reform, see for example Lardy (1998). For specific studies suggesting the importance of ownership structure in China, see, for instance, Chang, McCall, and Wang (2003), who find that Chinese township and village enterprises with better defined ownership have significantly better performance. In addition, Zhang, Zhang, and Zhao (2003) find that state ownership leads to lower R&D and productive efficiency in industrial firms.

⁵ For a literature review of prior studies on U.S. CEO compensation, see Footnote 1. The U.K. is one other country where CEO compensation data are readily available (Conyon, 1997). For other countries, in particular Asian countries, data on CEO compensation are typically not publicly available and thus most studies use average pay for all executives. See, for instance, Kaplan (1994), Xu (1997), Ang and Constand (1997), Joh (1999) and Kubo (2001) on Japan; and Kato, Kim and Lee (2004) on Korea. The rare exception is Kato and Kubo (2003), which use proprietary data on Japanese CEO compensation.

Mengistae and Xu, 2004).⁶ In addition, they demonstrated that most SOE reform measures in the 1980s and the 1990s were by and large successful in enhancing pay-performance link. Thus, Groves et al. (1995) provide evidence consistent with the view that the SOE reform measures in the 1980s including profit responsibility contracts have improved pay-performance linkage. Mengistae and Xu (2004) show that certain specific reform measures such as profit retention increase pay-performance link while others including autonomy in production and sales decisions do not.

By exploring pay-performance relations for listed firms in China, our paper complements these early pre-stock market studies. First, by using unique data on executive compensation in China's listed firms, we are able to provide the first estimates on pay-performance sensitivities and elasticities (standard measures of pay-performance relations used in the literature gauging the degree of sensitivities of executive pay to stock market performance as opposed to accounting performance). Second, while the majority of listed firms are still controlled by the government, there is a considerable variation in the degree of state ownership and control among listed firms. Such a variation will for the first time allow us to study how ownership structure influences pay-performance relations and thus the quality of corporate governance. Third, our data contain unique information on board characteristics which enables us to address for the first time whether gradualist corporate governance reform measures have been effective.

The structure of the paper is as follows. In Section II, we develop our main hypotheses by providing institutional information on China's stock market, listed firms, and executive compensation in the context of its enterprise reform while reviewing the relevant literature. Section III describes data, followed by Sections IV where the econometric specifications are discussed and the main results are presented. Section V concludes by summarizing the findings and discussing their policy implications.

⁶ Liu and Otsuka (2004) provide useful information and findings on top management incentives in steel industry in four provinces in China although they do not examine pay-performance sensitivity.

II. Institutions and Hypotheses⁷

Emerging Stock Market and Listed Firms in China

We begin with a brief description of the emergence of China's stock market and its listed firms. In China the interest in the stock market and listing of firms on the market was initially sparked in the late 1980s and early 1990s as part of the government's effort to help SOEs raise capital and reduce debt burden. However, in recent years the importance of the stock market and listed firms in China has increased substantially and they have become heralded as a centerpiece of China's enterprise reform, especially for its largest SOEs.⁸

The establishment of the modern stock market in China started in the late 1980s, with stock exchanges established in Shanghai at the end of 1980 and Shenzhen in early 1991 and the first Chinese company going public in 1991. But its rapid development did not begin until the mandate of the Chinese Communist Party's (the CCP) 14th Congress. In contrast to the largely piece-meal SOE reform measures adopted in the 1970s and 1980s, the CCP's 14th Congress in October 1992 opened a new chapter in China's SOE reform by proposing to establish a modern corporation system that resembles the West.⁹ This decision was made possible only after the Party accepted to "build a market economy with Chinese characteristics" as a target for China's economic reform and has made SOE reform a major component of China's economic reform since then.

Soon after the 14th Congress, the National Peoples' Congress (NPC) and its Standing Committee passed the Corporate Law in 1993, which laid out the fundamental rules for corporate governance in

⁷ This section is enriched especially by a series of interviews we conducted with executives of listed firms and securities firms, staff of government regulatory agencies, and researchers studying corporate governance issues in four Chinese cities, Chengdu (Sichuan), Shanghai, Beijing, and Tianjin, during the summer of 2004. We are grateful for support from these individuals.

⁸ The government's policy stance to emphasize the role of the stock market and the listed firms in China's SOE reform can be observed from numerous speeches given by policy makers in charge of enterprise reform. For instance, in a speech given at the "Meeting on How to Establish the Modern Enterprise System in Listed Firms" held in December of 2002, the chairman of the Economic and Trade Commission, Mr. Rongrong Li, stated that China's enterprise reform and modernization in the coming years will be focused on listed firms.

⁹ Earlier SOE reform measures were mainly designed to align the interests of SOE management and the government, and they include the administrative decentralization and profit retention policies (*fangquan rangli*) in the late 1970s to the early 1980s; the changes in the forms of profit sharing and funding sources for SOEs during the mid to late 1980s (*ligaishui* and *bogaidai*); and the incentive contracts for managers and workers during the late 1980s (*chengbaozhi*). For a detailed discussion on China's earlier enterprise reform from a historic perspective, see Naughton (1995) and Yang (1997). For a general discussion on enterprise reform in transition economies, see Megginson and Netter (2001).

modern Chinese corporations and provided blueprints for SOE restructuring and reform. In 1997, the Chinese Communist Party's 15th Party Congress made the shareholding system a centerpiece of China's enterprise restructuring and public listing a main vehicle to achieve the goal for large SOEs, and this led to a rapid increase in the number of firms listed in the two stock exchanges in China.¹⁰ The development of the stock market was further prompted by the passage of the Securities Law in 1998. By early 2004, China's stock market has emerged as the eighth largest in the world with close to 1,300 listed firms and market capitalization of over \$550 billions.¹¹

The 1993 Corporate Law of China recognizes two types of corporations: closely held corporations (*youxian zeren gongsi*) and publicly-held corporations (*gufen youxian gongsi*), with the latter requiring higher levels of registered capital and a larger number of shareholders. Both types of corporations are required to establish three corporate governing bodies: (i) the shareholders (acting as a body at the shareholder general meeting); (ii) the board of directors; (iii) and the board of supervisors, although a closely held corporation with "few shareholders" and "small capital size" can take exceptions to the rules.¹²

In terms of property rights created by share ownership, the Corporate Law clearly stipulates that shareholder rights include the right to investment interests, the right to make decisions regarding corporations' development strategies, and the right to hire management (Corporate Law §1, 1993). Although the final source of power in the corporation rests with the shareholder general meeting, the general meeting delegates to the board of directors the rights to make daily operation decisions including hiring and firing the management and determining the compensation of the management, while the board of supervisors in Chinese firms consists of both shareholder representatives and company employee representatives and oversees the board of directors and management (Corporate Law §3, 1993).

¹⁰ See, for instance, Jefferson et. al. (2003).

¹¹ There were 1,288 firms listed in the Shanghai and Shenzhen Stock Exchanges by the end of April in 2004. Source: Shanghai and Shenzhen Stock Exchanges. One estimate puts the market capitalization in China's stock markets at about 50% of China's GDP, which is comparable to the ratio in Japan (See People's Daily, Feb. 22, 2001). A more conservative estimate discounting values of shares owned by the state and legal persons puts the ratio at 20%.

¹² Specifically, a small closely held corporation can opt to not set up a board of directors. Instead it suffices to have a single executive director and the executive director may serve concurrently as the manager. In addition, such a corporation is not required to have an entire board of supervisors. One or two supervisors will suffice. See Corporate Law §3 (1993). For a detailed discussion on China's Corporate Law of 1993, see Schipani and Liu (2001).

Listed firms are publicly-held corporations that are allowed by the Chinese Securities Regulatory Commission (CSRC) to issue and trade shares in one of the two stock exchanges in China, the Shanghai Stock Exchange and the Shenzhen Stock Exchange. As such, in addition to abiding by the stipulations in the Corporate Law, listed firms are regulated by the Securities Law of 1998 and other stipulations issued by the CSRC. In particular, the CSRC has various disclosure requirements for listed firm in China, including publication of its annual report in at least two newspapers with large circulations approved by the commission, in which basic information of the firm's ownership structure, investment decisions, and financial conditions is disclosed. The firm is also required to provide several measures of executive compensation in its annual report, which makes this study possible.

Although on the surface the corporate structure of listed firms in China looks very much like listed firms in the West, ownership structure of these firms is very different from that in the U.S. and other market economies, with the most important feature being the dominance of government ownership. Most listed firms are restructured from SOEs, and when going public, state owned assets in these firms are converted into shares owned directly or indirectly by the government and in addition they are encouraged to issue new shares to other SOEs. As a result, the government dominates the ownership and control of many listed firms in China.¹³

Executive Compensation Reform in China

We now describe how the mechanism for determining executive compensation in Chinese firms, especially Chinese SOEs, has evolved in the past two decades, with particular focus on the current form of executive compensation reform in China, the “yearly salary system”. Before economic reform started in the late 1970s, executive compensation, as part of the rigid compensation system employed in pre-reform Chinese enterprises, was largely determined based on factors that do not reflect either firm performance or individual contributions, and the factors include the region, industry, level of management (central or local government) and size of the enterprise, and job title, occupation, and seniority of the individual. The profit retention policies introduced in the late 1970s and the “profit responsibility

¹³ See for instance Sun and Tong (2003) and Bai, et. al.(2003).

contract” system adopted in the 1980s represented the early steps in China’s executive compensation reform, where managers were allowed to use a portion of the residual profit to increase compensation for workers and themselves.¹⁴

Two waves of SOE compensation reforms promulgated in 1985 and 1992 allowed the SOE’s wage budget to be linked to its economic performance and permitted the SOE to set its own internal wage structure within the wage budget, thus helped introduce more profit-oriented incentives to employees working for SOEs in general. One main compensation mechanism that emerged from this reform is the system of fixed monthly salary plus bonus payment for SOE employees. Two constraints, however, limited the scope of reform in executive compensation. The wage budget for SOEs still had to be approved in advance by the former Ministry of Labor (MOL) to avoid paying a Wage Adjustment Tax for the part exceeding the governmental standard wage bill. In addition, management in an SOE still did not have the ability to effectively hire and fire employees. As a result, the bonus payment in this system is largely egalitarian compensation that lacked real incentive effects (Liu and Otsuka, 2004).¹⁵

It was only after the pilot implementation of the “yearly salary system” in 1992 that substantive executive compensation reform really started to take off. In the same year when the CCP accepted “a market economy with Chinese characteristics” as the target for China’s economic reform and a modern corporation system resembling corporations in the West as the goal for SOE reform, the State Council approved the Shanghai Hero Pen Company to try out the pilot “yearly salary system.” By 1994, Beijing, Shenzhen, Sichuan, Henan, and Liaoning had also started their own pilot programs, followed by the national pilot program implemented in 100 large SOEs throughout the country. The pilot experiment was well received and the “yearly salary system” thus became the most important form of executive compensation reform in China since 1997, when the former MOL officially advocated “vigorous and smooth implementation” of the system in SOEs.¹⁶

¹⁴ See Groves et al. (1995) and Mengistae and Xu (2004) for empirical evidence that executive compensation was linked to accounting performance measures under the “profit responsibility contract” system.

¹⁵ For a detailed discussion on general compensation reforms in China, see Yueh (2004).

¹⁶ See the former MOL circular “The Main Goals and Policy Measures for Enterprise Compensation Reform during the Ninth Five Year Plan Period” issued in March of 1997.

The compensation for top executives in the “yearly salary system” consists of two parts: a fixed component (known as the base salary) that depends on both the average wage for ordinary employees and the size of the enterprise; and a variable component (known as the risk salary) that is linked to both the base salary and the economic performance of the firm in the year. The base salary is paid to executives on a monthly basis, while the risk salary (or at least a large part of it) is distributed at the end of the year. Firm performance measures used in the risk salary calculation typically include profit although some SOEs such as public utilities also consider non-financial measures such as occupational safety and health records.¹⁷

As shown above, the pay-performance structure of the variable component in the “yearly salary system” is much like “bonus” in the compensation package of a CEO working for a western firm. The “yearly salary system,” therefore, corresponds to a typical cash compensation package in western firms.

In short, China’s current public policy makers appear to recognize the importance of executive compensation as a key incentive mechanism for top management and consider it a vital component of enterprise reform. As a result, a new compensation system with stronger relations of pay to firm performance has been advocated by the policy makers and implemented by Chinese firms in recent years. Being harbingers of the new modern Chinese enterprises, listed firms are particularly expected to have adopted more efficient and Western-style corporate governance with strong pay-performance link for top managers. Thus, our first hypothesis is:

Hypothesis I: In China’s listed firms, executive compensation is positively linked to firm performance (including standard stock market performance measures as well as accounting measures).

Nonetheless, some scholars question the efficacy of China’s shareholding experiment via listed firms. For instance, Lin (2001) argues that China’s SOE restructuring has failed to facilitate any major improvement in corporate governance. Based on interviews with government officials, stock exchange regulators, CPAs, security and corporate lawyers, and officials at both listed and non-listed firms, the

¹⁷ The discussion on the “yearly salary system” benefited greatly from the actual compensation plans provided by two firms in Sichuan. For an authoritative discussion on the various components of CEO pay in the U.S., see Murphy (1999).

paper concludes that corporate governance in listed firms in China is of very low quality, characterized by excessive powers of the CEO and insider control, inadequate safeguards for outsiders, weak managerial incentives, and inadequate transparency and disclosure. According to Lin (2001), the source of poor corporate governance practices in Chinese-listed firms is the large percentage of company shares owned by the state, which results in the government's dominant role in firm management and control. In short, many listed firms are viewed as merely the reincarnations of SOEs that have inherited both the inferior corporate governance and the poor firm performance.¹⁸

More generally, there are two reasons why listed firms with greater state ownership and control behave differently from more privatized listed firms. First, because state shares are not tradable on the market, greater state influence means less exposure to the market and thus less market discipline on executives and more room for rent-seeking behavior, resulting in poorer corporate governance and weaker pay-performance link for top management. Second, listed firms with greater state ownership and control are more likely to remain under the influence of the legacy of arrangements in old Socialist economies.¹⁹ For instance, although the “yearly salary system” was first advocated by the government as a mechanism to improve SOE performance, the new compensation system saw much faster adoption among privatized firms than among SOEs after it proved to be an effective incentive mechanism. According to a national survey conducted in 2002, the percentages of enterprises that had adopted this more progressive compensation system ranged from 15.2% for SOEs, to 20.2% for collective firms and 41.4% for privatized firms.²⁰ Furthermore, both our interviews with firm executives and a review of several compensation plans used in these firms highlight the differences between how SOEs and wholly privatized firms in China implement the “yearly salary system.” The SOE firms often include factors such as occupational safety and health records in their performance indicators, while the fully privatized firms tend to be more focused on profit and stock performance.²¹

¹⁸ For a similar view, see Schipani and Liu (2001).

¹⁹ For the negative impact on managerial incentives of these arrangements, see Bonin (1976), Weitzman (1976), Kornai (1992), Ickes and Samuelson (1987), Litwack (1991), and Dewatripont and Roland (1997).

²⁰ See “Report on Chinese Entrepreneurs: Emergence and Development” (*Zhongguo qiyejia chengzhang yu fazhan baogao*), p27, issued by the Survey System for Chinese Entrepreneurs 2004.

²¹ Dong and Putterman (2003) provide empirical support for a similar argument explaining why state

The procedures for determining executive compensation in China also suggest that listed firms with greater state ownership and control will face more resistance in reforming executive compensation due to their strong inertia of government policies and bureaucratic procedures. These procedures for determining SOEs' executive compensations differ substantially from the procedures dictated by the market for effective incentive mechanisms, and render it difficult to link compensation to performance.

Specifically, the bureaucratic structure used till very recently for managing government shares in listed firms involves at least three separate government agencies.²² The CCP's Department of Organization (DOO), the Economic and Trade Commission or the Industrial Commission (ETC), and the Ministry of Finance (MOF) were in charge of the personnel, operations, and asset management of all listed firms respectively. Since each agency has its own line of duties and there is not much communication among them, the determination of executive compensation, which is mainly under the authority of the DOO, rarely depends on the firm's performance, which is evaluated by the ETC and MOF. Instead, in determining the level of compensation for top executive, the DOO uses the compensation level for government officials at the same rank as a reference and makes certain adjustments based on firm size and the executive's education and working experience. Compensation for other executives will then be certain proportions of the top executive's pay level. For instance, the VP's salary will be 80% of the CEO's salary, and so on. The compensation figures will then be submitted to the board of directors, which will almost always approve them. Although sometimes the board of directors of a listed firm makes recommendations to give bonuses to executives because of good firm performance, these instances are far and few in between.

Our second hypothesis is then:

Hypothesis II: Executive pay-performance link in China's listed firms will become stronger as the degree of state ownership and control falls.²³

ownership slows down the interest alignment process between top managers and shareholders, namely that state-owned enterprises and thus their top executives in transition economies are often required to pursue non-financial objectives such as employment provision. For a more formal theoretical argument, see Schmidt and Schnitzer (1993).

²²It was only in March 2003 that the State Council decided to set up the State Asset Supervision and Administration Commission (SASAC), which would combine management of personnel, operations, and assets of state owned enterprises.

²³ The hypothesis is consistent with the Coase Theorem that efficient incentive mechanisms spring from clearly defined property rights.

Note that this view contrasts with the belief that the gradual and piecemeal approach adopted by the Chinese government for reforming its SOEs will succeed in the long run without decreasing state ownership and control substantially. Specifically, the hypothesis implies that China's shareholding experiment with its large firms (characterized by creating the stock market and listed firms without decreasing state ownership and control substantially) is not helping corporate governance of Chinese enterprises significantly.

We are, however, also aware of several arguments that may imply positive effects of government ownership on corporate governance. Large percentage of government shares may signal to the market that shareholders' wealth will not be expropriated and lower uncertainty for domestic investors.²⁴ In addition, substantial government ownership may prevent large scale state asset stripping and mitigate rabid rent-seeking behaviors of managers when markets are lacking.²⁵ Finally, it is well known that private firms in China are inferior to SOEs in both their level of management and technology as well as the quality of their employees.²⁶ Since superior incentive mechanisms are often initiated by capable executives who have superior managerial skills, it could then be argued that firms with greater state ownership and control are more capable of adopting the more efficient incentive measures including executive compensation reforms.

Previous empirical work has been focused on the effects of ownership structure on firm performance with mixed results. We contribute to the important policy debate by providing the first systematic evidence on the effects on executive pay-performance link (and thus the quality of corporate governance) of state ownership and control of listed firms.²⁷

²⁴ See, for example, Perotti (1995) and Mok and Hui (1998).

²⁵ See, for example, Jefferson (1998), Stiglitz (1997), and Lin, Cai and Li (1998)

²⁶ See, for instance, Naughton (1995).

²⁷ For a summary of arguments on the negative role played by government ownership in firm performance, see Shleifer (1998). For a model implying positive effects of state ownership in SOEs, see Perotti (1995). Megginson and Netter (2001) provide a comprehensive survey of empirical studies on the effects of government versus private ownership on firm performance. Laffont and Tirole (1993) emphasize the importance of empirical studies as follows, "theory alone is thus unlikely to be conclusive in this respect."

Relatedly, earlier studies on the impact on firm performance of state ownership in China's listed firms often distinguish direct state ownership through state shares and indirect state ownership via legal person shares.²⁸ Specifically, according to these early studies, government ownership in a listed firm in China can be obtained directly through state shares or indirectly through state legal person shares. State shares are owned and thus controlled directly by the government, while state legal person shares are owned by government asset management agencies or SOEs to which the government delegates the authority to manage state owned assets and thus are controlled indirectly by the government.

Although state shares and legal person shares have many features in common, including the eventual control by the government and the non-tradability on the stock market, it has been argued that these two categories of shares may have different effects on firm performance. In terms of its impact on corporate governance, direct government ownership via state shares might be considered superior to indirect government ownership via legal person shares. Chinese scholars often attribute the inefficiency of Chinese SOEs to the long chain of principal-agency problems in these firms.²⁹ For legal person shares that have the state as their eventual owner, there exists an additional layer of principal-agency relationship between the listed firm and the legal person (another SOE) on top of the principal-agency relationship between the legal person (SOE) and the state. To the extent that the principal-agency problem is not negligible between the state and the legal person (SOE) or between the legal person (SOE) and the listed firm, the multi-layer principal-agent relationship tends to increase the principal-agency costs faced by the listed firm controlled by legal person (SOE) shareholders. Moreover, for listed firms controlled by SOEs via legal person shares, there appears to be an additional constraint on the determination of executive pay. That is, the controlling SOE normally does not allow the listed firm to set its executive compensation level higher than that of the controlling SOE even if the listed firm performs far better than the SOE.³⁰

²⁸ Chen (1998) finds evidence that direct state ownership positively affects firm performance, whereas legal-person ownership negatively affects firm performance. In contrast, Xu and Wang (1999) argue that legal-person ownership enhances firm performance because legal-persons are in a better position monitoring the firm's operation, a claim supported by their empirical evidence that legal-person ownership has a positive impact on the firm, whereas state ownership has no impact. Sun and Tong (2003) also find evidence in support of the latter argument. Specifically, they find that state ownership has negative effects while legal-person has positive effects on firm performance

²⁹ See Qiang (2003) for instance.

³⁰ See for instance an interview conducted with multiple executives working in listed firms controlled

Thus, our third hypothesis is then:

Hypothesis III: Executive pay-performance link in China's listed firms will become weaker as state ownership becomes more indirect with the expanding use of legal person shares.

Note that some scholars argue that indirect government control via legal person shares is superior to direct government control. Direct control by the government through state share ownership implies more government intervention (for example, more red-tape and regulations) and therefore less efficient operations in firms. In addition, state shares are usually managed by government financial bureaus or state asset management companies that often oversee many state owned enterprises, and therefore the monitoring of state shares is not as effective as that of legal shares.³¹ Finally, legal person shareholders often have close business relationships with listed firms and therefore have more interest in their performance.³² Previous empirical research has studied the different effects of state shares and legal person shares on firm performance and produced mixed evidence (see footnote 28). We will provide the first study contrasting state shares with legal person shares in their effects on pay-performance linkage. By testing the validity of the hypothesis above, we will help resolving this important public policy controversy.

Lastly, recommendations for corporate governance reform in developing countries and transition economies often include the appointment of independent directors to the board of directors and the separation of the CEO position from the board chairmanship.³³ In China, the appointment of independent directors as a means to enhance the board independence from management has been formally recommended by the Chinese government. According to the “Guidelines for Establishing Independent Director System in Listed Firms” issued by the CSRC on August, 16th, 2001, each listed firm in China was required to have at least two “independent directors” on its board of directors by June 30th, 2002, and

by SOEs (reported in a Chinese newspaper, *Securities Times (zhengquan shibao)*, 2003-07-31).

³¹ See, for instance, Xu and Wang (1999).

³² See, for example, Sun and Tong (2003).

³³ For example, following the Asian Crisis, a number of corporate governance reform measures were imposed on many crisis-hit Asian countries, such as South Korea, Indonesia, Thailand and Malaysia. All these countries now require a minimum percentage of independent outside directors on the board. See Nam and Nam (2004) for more detailed description of these corporate governance reform measures.

by June 30th, 2003, at least one third of the board members were required to be “independent directors.”³⁴ The CSRC also states in the “Guidelines” and the “Corporate Governance Model Codes” that the board of directors should establish committees in charge of compensation, auditing, and nomination. In addition, at least half of the members serving on these committees should be “independent directors” and “independent directors” should also serve as the chairs of these committees.

Regarding the separation between board chairmanship and CEO position there is no clear stipulation in the Company Law or other laws in China. However, many Chinese scholars and policy makers have recommended the separation as a good corporate governance practice.³⁵

In theory, both the appointment of independent directors and the separation of the CEO position from the chairmanship of the board of directors will help strengthen the independence of the board of directors from management, resulting in stronger control of management entrenchment and better alignment of the interests of management with the interests of shareholders. If these measures are effective in strengthening the alignment of interests between management and shareholders, more significant and stronger executive pay-performance link will be observed for firms with more independent directors or with the CEO position separated from the board chairmanship.

However, in reality, in many developing economies and transition economies, “independent directors” are often not really independent of management and the separation of the board chairmanship from the CEO position does not necessarily enhance the board independence from management (see Footnote 33). China does not appear to be an exception. For example, “independent directors” play a minimal role in influencing the corporate governance of listed firms in China and are often described as “flower vases.” Multiple reasons have been cited for why the existence of “independent directors” has not enhanced the board independence from management in China. First, “independent directors” may not

³⁴ In order for a director to be considered “independent”, an individual need to meet the following three conditions: (i) Neither the individual nor his or her relatives (including spouses, parents, children, siblings, parents in law, sons and daughters in law, spouses of siblings, and siblings of spouses) work for the listed firm or its subsidiaries; (ii) the individual does not directly or indirectly own more than 1% of the stock of the listed firm; (iii) neither the individual nor his or her close relatives (including spouses, parents and children) are among the largest 10 shareholders of the listed firm; (iv) neither the individual or his or her close relatives work for a company that owns more than 5% of the stock of the listed firm; and (v) neither the individual nor his or her close relatives work for one of the largest 5 shareholder companies.

³⁵ See, for instance, He (2004). Mr. Jiancheng He is the chair of SASAC’s (State Asset Supervision and Administration Commission) supervisory board in charge of the largest SOEs.

have the ability to monitor management because they have limited access to company information and limited legal rights to challenge decisions made by management. Second, “independent directors” are often chosen by management and used to enhance the public image of the company. Third, “independent directors” are paid a substantial amount of allowance without having to commit a lot of time and effort, and the prospect of keep the plum job further reduces the incentive of the “independent directors” to have conflict with management who controls the hiring and firing of “independent directors”. Finally, some “independent directors” who have sought external auditing of several listed firms have been forced to resign in the past two years, posing a chilling effect on other “independent directors.”³⁶

Regarding the effect of separating the positions of chairman and CEO, since the majority of board members and management are both appointed by the largest shareholders, the board of directors is not truly independent of management in most listed firms in China, and the artificial separation of CEO and chairman may not be sufficient to achieve the real independence of the board. In addition, even without the title of CEO, the chairman of the board of directors in many listed firms works as the top executive in the firm, often with more power than the CEO. As a result, the chair of the board of directors, who is supposed to be the representative of the board that is independent of management, is often part of the top management team.³⁷ Thus, we have a pair of hypotheses concerning board characteristics:

Hypothesis IV: The appointment of “independent directors” to the board of directors in China’s listed firms is ineffective in making executive pay-performance link stronger.

Hypothesis V: The separation of the CEO position from the board chairmanship in China’s listed firms is ineffective in making executive pay-performance link stronger.

³⁶ See for instance, World Business Review, September 28, 2004, Beijing Morning News (*Beijing chenbao*), October 21, 2004, and Shanghai Morning News (*Shanghai chenbao*), Oct. 22, 2004. Our interviews with corporate executives at listed firms in Shanghai and Chengdu, Sichuan also confirm these views. Presently the Chinese government appears to be well aware of the ineffectiveness of “independent directorship” in China’s listed firms. According to World Business Review, 2004-09-28, the CSRC has just issued numerous measures designed to enhance the effectiveness of “independent directorship.” The new measures will give “independent directors” more voting rights regarding related party transactions and more authority to hire independent accounting and auditing firms with costs paid by the listed company. In addition, cumulative voting will be required in selecting “independent directors,” which will allow small shareholders a more important role in choosing “independent directors.”

³⁷ For instance, according to the corporate governance survey conducted in 2001 by the Shanghai Stock Exchange (SSE) of Chinese firms listed in SSE, 44.8% of the firms have their chairmen of the board who do not serve as CEOs yet work full time as the top executives in their firms. (See China Securities News (*zhongguo zhengquanbao*) January 31, 2002.

III. Data

Accounting and financial data are obtained from the China Stock Market and Accounting Research Database (CSMAR) developed by Shenzhen GTA Information Technology Company, while executive compensation and ownership structure data are assembled from the database developed by Sinofin Information Services. The CSMAR data set has been used in previous studies,³⁸ yet on our reading of the literature, we are the first to use the Sinofin dataset in academic research. Data are available annually for 1998 through 2002 although data are more complete for later years.

The data allow us to consider total cash compensation (including salary and bonus) whereas data on other forms of compensation (such as equity ownership, stock option, perquisites) are not available as in other international studies on executive compensation outside the U.S. However, we expect our main results to be robust even when other components of executive compensation are considered.³⁹ First, while no information is available for perquisites enjoyed by executives of China's listed firms, we do know that these perks do not vary from year to year and therefore excluding perks will not bias our estimates on pay-performance link in the first-differenced models which we use (see the next section for more details on our econometric specifications).⁴⁰

Second, unfortunately data on equity ownership of executives that can be merged consistently with our cash compensation data are presently unavailable. Thus, we are unable to incorporate this potentially important form of executive compensation into our analysis. However, considering equity ownership of executives is likely to strengthen our main conclusions. First, overall we find statistically significant pay-performance link for top management in China's listed firms when considering only cash compensation. Considering equity ownership of executives (the value of which will be obviously directly related to stock market performance of the firm) will make executive pay-performance link even more

³⁸ See, for instance, Sun and Tong (2003), Bai, et. al (2003), and Bai, Liu, and Song (2003).

³⁹ According to the rules from the CSRC (China Securities Regulatory Commission) that regulates the content of listed firms' annual reports, all listed firms have been required to report executive compensation including salary and bonus. Unfortunately they are not required to report salary and bonus separately and hence we are unable to analyze these two main components of cash compensation separately as Kato and Kubo (2003) did for their study of Japanese CEO compensation.

⁴⁰ For instance, see Liu and Otsuka (2004) that reports helpful institutional information on compensation packages provided for steel industry top executives in four provinces in China. Our field work in four Chinese cities during the summer of 2004 also confirms this point.

significant. In other words, the pay-performance sensitivities that we report can be regarded as lower bounds on total sensitivities of executive compensation in China's listed firms. Second, we find executive pay-performance link is weaker for listed firms with greater state ownership and control than other listed firms. This negative relationship between state ownership and pay-performance link is likely to become even more significant if we include equity ownership of executives since equity ownership of executives tends to be more restricted in listed firms with greater state ownership and control.⁴¹ Put differently, total sensitivities of pay to stock market performance in firms with greater state ownership and control are likely to be smaller than those in other firms for two reasons. First, sensitivities of cash compensation to stock performance are smaller in firms with greater state ownership. Second, compensation in equity ownership which is naturally highly sensitive to stock performance is less common in firms with greater state ownership.

Finally, no listed firms in China had adopted stock option as part of executive compensation packages as of the end of 2002.⁴² It was not until early 2003 when the CSRC chose two pilot firms to test run a stock option plan.⁴³

Among the several measures of executive compensation provided in the Sinofin database, TOP THREE EXECUTIVE AVERAGE PAY that includes total annual cash compensation for CEO and two other highest-paid executives (often vice CEOs) is the closest to what most prior studies on executive compensation used (typically CEO pay) and thus will be the focus of our study. However, we also considered two other more aggregate measures of executive compensation, TOTAL EXECUTIVE PAY (total annual cash compensation for all directors, supervisors, and high-level executives) and AVERAGE EXECUTIVE PAY (TOTAL EXECUTIVE PAY divided by the number of all directors, supervisors and

⁴¹ Chinese government has refused to allow state shares to be used in equity holding plans, and as a result listed firms with higher percentage of state shares find it more difficult to issue company stock as part of executive compensation package (See the 2003-07-30 issue of Shanghai Securities News, *shanghai zhengquan bao*).

⁴² China Industry and Commerce Times, *zhonghua gongshang shibao* (2002-11-07).

⁴³ International Finance News, *guoji jinrong bao* (2003-4-28).

high-level executives). As expected, we found weaker and often insignificant pay-performance link with these more aggregate measures.⁴⁴

Finally, we are most fortunate that the data contain sufficiently rich information on the nature of ownership and corporate governance of each listed firm which is of particular relevance to transitional economies like China. Such information will enable us to provide important and fresh insights on one of the most vital policy issues in such economies, i.e., the importance of ownership restructuring and corporate governance reform in the enterprise reform in transitional economies.⁴⁵

Specifically, the data allow us to calculate for each firm: (i) GVTSHARE (percentage of company shares owned by the state); (ii) STATESHARE (percentage of company shares owned directly by the state); (iii) LGLPSHARE (percentage of company shares owned indirectly by the state via state “legal persons shares”, including government asset management agencies or SOEs to which the government delegates the authority to manage state owned assets and thus are controlled indirectly by the government); (iv) INDEPENDENT (proportion “independent” directors); and (v) DUAL (dummy variable taking a value of one if the firm’s CEO is also the chairman of the board of directors, zero otherwise).

Table 1 reports descriptive statistics on the level of executive compensation, ownership structure and several other key firm characteristics, where all value variables are adjusted for inflation using CPI (FY1995=100) and are thus expressed in 1995-constant RMBs. These statistics were calculated based on a pooled cross-sectional time series dataset on 942 firms. They can be compared to prior studies such as Kaplan (1994) for Japan and the U.S.; Kato and Kubo (2003) for Japan; and Kato, Kim and Lee (2004) for Korea that report similar statistics. In particular, while average cash compensation for top three

⁴⁴ The weaker pay-performance and often insignificant relations for TOTAL EXECUTIVE PAY and AVERAGE EXECUTIVE PAY can be explained by the fact that they include pay for not only top executives and directors but also other executives and members of the board of supervisors, many of whom are employee representatives (typically union leaders). The 1999 listed firm survey conducted by the Shanghai Stock Exchange (Shanghai Stock Exchange 1999) finds that 73.4% of the supervisory board chairs and the vast majority of supervisors serving in Chinese-listed firms are employee representatives. Similarly, Fleisher and Wang (2003) find for their sample of Chinese township and village enterprises that the ratio of management pay to worker wage is positively related to the potential residual of the company, suggesting that management pay is more aligned with firm performance than worker pay.

⁴⁵ See, for instance, Estrin (2002) and Jones and Mygind (2004).

executives in Chinese listed firms is much lower (RMB97,000 or approximately \$12,000) than that for their counterparts in Japan and Korea, the ratio of average top three executive pay/average worker pay (at around 12) is substantially higher in China. The ratio is also higher than in other transition economies.⁴⁶ Similarly, the average executive in China's listed firms appears to be better paid relative to the average worker in manufacturing (with a ratio of around 7) than their counterparts in Japan and Korea. Using data from Kubo (2001) for Japan and Kato, Kim and Lee (2004) for Korea and the ILO average manufacturing worker wage, we found that the ratio of average executive pay to average manufacturing worker wage was 4.2 for Japan in 1995-96 and 5.6 for Korea in 1998-2001. However, the Chinese ratio as well as its executive pay is still considerably lower than the comparable U.S. figures.⁴⁷

Several other key firm characteristics are also shown in Table 1. The average listed firm in China employed over 3,000 workers. The average size of the board of directors and supervisors were 9.7 and 4.3 respectively whereas the average number of directors, supervisors and other top-level executives considered in calculating TOTAL EXECUTIVE PAY was 11.2, suggesting that there were a non-negligible number of directors and supervisors who were not paid by the firm.⁴⁸ On average, about 14 percent of the board members are "independent directors", and approximately one in ten listed firms has the same individual occupying both the CEO position and the board chairmanship. Sales revenue of the average listed firm was 1.4 billions of 1995-constant RMBs and the market value of the average listed firm was 1.7 billions of 1995-constant RMBs. Over the period of 1998-2002, many listed firms in China experienced poor stock market performance. Thus, the average rate of inflation-adjusted stock return was negative 14 percent over the sample period. On the other hand, ROA (a standard accounting performance measure) was on average positive although small (0.01). The average probability of China's listed firms reporting a negative before-tax profit was about 12 percent over 1998-2002.

⁴⁶ See Jones and Kato (1996 and 1998) for Bulgaria, and Jones and Mygind (2004) for Estonia.

⁴⁷ See, for example, Kaplan (1994, Table 4) and Murphy (1999, Figure 1) for the comparable U.S. figures.

⁴⁸ These are directors and supervisors working for the firm's largest shareholder firms (mostly SOEs) and thus paid by the "parent" firms. Since they are affiliated with related companies, they are not "independent directors".

Finally, data on ownership structure reveals that China's shareholding experiment via listing of SOEs in stock exchanges is still in its early stage. The average listed firm still has 33 percent of its company stock directly owned by the state; 27 percent owned by domestic legal persons and thus owned indirectly by the state; and nearly 60 percent of its stocks owned by the state.

IV. Econometric Specifications and Results

Firm Performance and Executive Compensation: Testing Hypothesis I

We begin with estimating two standard measures of pay-performance relations for executives (see, for example, Murphy, 1999). First, we estimate the sensitivity of pay with respect to shareholder value by regressing the change in executive compensation on the change in shareholder value of the firm. Second, we estimate the elasticity of pay with respect to shareholder value by regressing the change in the log of executive compensation on the change in the log of shareholder value of the firm.⁴⁹ Specifically, we estimate,

$$(1) \quad \Delta(\text{PAY})_{it} = a + b\Delta(\text{VALUE})_{it} + (\text{year effects}) + u_{it}$$

$$(2) \quad \Delta \ln(\text{PAY})_{it} = \alpha + \beta \ln(1 + \text{ROR}_{it}) + (\text{year effects}) + u_{it}$$

where PAY_{it} is executive compensation of firm i in year t ; VALUE_{it} is shareholder value of firm i in year t ; and ROR_{it} is stock return of firm i in year t .⁵⁰ We control for time-specific shocks that are common to all firms by including year effects in our regressions. For the disturbance term, u_{it} , we assume $u_{it} \sim \text{NID}(0, \sigma^2)$.⁵¹

⁴⁹ As shown in Murphy (1999), the change in the log of shareholder value of the firm is equal to $\ln(1 + \text{ROR}_{it})$ where ROR_{it} is stock return of firm i in year t .

⁵⁰ The literature sometimes considers relative performance (firm performance relative to its competitors' performance). Evidence is, however, mixed in general and in China, according to Megistae and Xu (2004), relative performance is not a significant determinant of executive pay.

⁵¹ Since both pay and performance variables are first-differenced, all firm fixed effects that may affect the level of pay are controlled for (we used first-differences so that we can compare our study to prior studies that tend to use first differences rather than estimating fixed effects directly). We also estimated each equation without year effects, and found no discernable differences. These results as well as all other unreported results are available upon request from the authors.

Since we use first differences in our econometric analysis, only firms for which data are available for at least two consecutive years can be used. Among the 918 firms for which we have data for at least one year over the period of 1998-2002, 827 firms provided data for at least two consecutive years. A standard two-sample test of means establishes that the new sample of 827 firms does not differ significantly from the original sample of 918 firms with regard to all the compensation and key firm characteristic variables listed in Table 1. The bulk of observations in our pooled cross-sectional time series data used for the first-differenced regressions are for 2001-2002 since most of the 827 firms do not provide detailed compensation data prior to 2001. Table 2 presents summary statistics of variables used in the regressions.

Table 3 presents the OLS estimates of Eq. (1) and Eq. (2) for each of the three compensation variables.⁵² As shown in the table, for the highest-paid three executives (TOP THREE EXECUTIVE AVERAGE PAY), both estimated sensitivities and elasticities of pay with respect to shareholder value are positive and statistically significant at the 1 percent level. The size of the estimated sensitivities suggest that a 1000 RMB increase in shareholder value yields a 0.054 RMB increase per executive in annual cash compensation for the highest-paid three executives.

Our estimates on top management pay sensitivities to shareholder value appear to be greater than what Jensen and Murphy (1990) and Murphy (1999) found for the U.S. For example, Murphy (1999) reports that a 1000 dollar increase in shareholder value leads to a 0.014 dollar increase in CEO's annual cash compensation for S&P 500 Industrials in the U.S. in the first half of the 1990s. We believe that the sensitivities of pay with respect to shareholder value are higher in China than in the U.S. in part due to the inverse relationship between pay-performance sensitivities and firm size (see Gibbons and Murphy, 1992, and Murphy 1999). Smaller firms tend to have larger sensitivities and Chinese listed firms are generally substantially smaller than U.S. listed firms.⁵³

⁵² Previous U.S. studies such as Jensen and Murphy (1990) and Murphy (1999) report very low R^2 statistics (typically well below 0.1). This is in large part due to the fact that the literature typically uses first differences instead of estimating fixed effects directly.

⁵³ To this end, comparing our sensitivity estimates to what Kato and Kubo (2003) report for Japanese CEOs

However, more importantly, the different compositions of executive compensation between China and the U.S. may account for the higher pay-performance sensitivities observed for Chinese listed firms. While they are rarely available for executives in listed firms in China, stock option plans are widely used for top executives in U.S. corporations. When stock options were taken into account in executive compensation, for instance, Jensen and Murphy (1990) estimated that a 1000 dollar increase in shareholder value lead to a 0.307 dollar increase in CEO's total compensation for 73 U.S. manufacturing firms between 1969 and 1983, implying much higher pay-performance sensitivities in U.S. firms than in China. Murphy (1999) further reports that since then total sensitivities have risen rapidly in the 1990s and that the sharp increase in total sensitivities in the 1990s was mostly due to the rising use of stock options.⁵⁴

Since pay-performance elasticities are relatively invariant to firm size, for international comparisons of pay-performance relations for executives, pay-performance elasticities may be particularly useful. As Table 3 shows, the size of our estimated elasticities suggest that a 10 percent increase in shareholder value results in 3.6 percent increase in annual cash compensation for the highest-paid three executives. Our elasticity estimates are considerably greater than what Kato and Kubo (2003) report for CEOs of listed firms in Japan in 1986-1995 and also greater than what Murphy (1999) reports for CEOs of S&P 500 Industrials in the U.S. in the first half of the 1990s.⁵⁵

Turning to the boarder category of executives (TOTAL EXECUTIVE PAY and AVERAGE EXECUTIVE PAY), as expected, pay-performance link is weaker. Specifically, the estimated pay-performance sensitivities are substantially smaller and no longer statistically significant, and the estimated pay-performance elasticities are still statistically significant yet considerably smaller than those for the

may be useful since Japanese listed firms are substantially smaller than U.S. listed firms. Reassuringly, our Chinese sensitivity estimates are closer to the Japanese estimates of 0.034.

⁵⁴ Thus, much of the recent literature on U.S. executive compensation tends to focus on the issue of stock options. See, for example, Hall and Murphy (2003) and Bebchuk and Fried (2003) for succinct discussions on the recent literature which tends to focus on stock options.

⁵⁵ Again, one ought not to conclude that Chinese executives are faced with a greater incentive to pursue the interests of shareholders than U.S. executives since the bulk of incentives for U.S. executives are in the form of stock option rather than in cash compensation.

highest-paid executives.⁵⁶ As discussed before, the broad category of executives include not only the highest-paid executives but also members of the board of supervisors, in particular employee representatives who are wage earners and executives below the top-three level. The managerial agency problem is less relevant to employee representatives and executives below the top three level than to the highest-paid executives (such as CEOs), and thus their compensation does not need to be as sensitive to firm performance as compensation for the highest-paid executives. Thus, for the remainder of the paper, we will focus on TOP THREE EXECUTIVE AVERAGE PAY.⁵⁷

Some prior studies on executive compensation (especially in countries outside of the U.S.) consider alternative performance measures such as accounting measures and estimate “semi-elasticities” of pay with respect to such alternative performance measures.⁵⁸ Following such prior studies on other Asian countries (Japan and Korea), we estimate:⁵⁹

$$(3) \quad \Delta \ln(\text{PAY})_{it} = \alpha_r + \beta_r \text{ROR}_{it} + (\text{year effects}) + u_{it}$$

$$(4) \quad \Delta \ln(\text{PAY})_{it} = \alpha_g + \beta_g \text{GSALES}_{it} + (\text{year effects}) + u_{it}$$

$$(5) \quad \Delta \ln(\text{PAY})_{it} = \alpha_d + \beta_d \text{DROA}_{it} + (\text{year effects}) + u_{it}$$

$$(6) \quad \Delta \ln(\text{PAY})_{it} = \alpha_n + \beta_n \text{NEGPROF}_{it} + (\text{year effects}) + u_{it}$$

$$(7) \quad \Delta \ln(\text{PAY})_{it} = \alpha_t + \beta_r \text{ROR}_{it} + \beta_g \text{GSALES}_{it} + \beta_d \text{DROA}_{it} + \beta_n \text{NEGPROF}_{it} + (\text{year effects}) + u_{it}$$

⁵⁶ The estimated pay-performance sensitivities for TOTAL EXECUTIVE PAY will need to be divided by 11 (the average total number of directors, supervisors and top-level executives included in the calculation of the variable) to be comparable to the estimated sensitivities for TOP THREE EXECUTIVE AVERAGE PAY and AVERAGE EXECUTIVE PAY.

⁵⁷ Aggarwal and Samwick (1999) report that pay-performance sensitivities in the U.S. are significantly greater for firms with greater stock price volatility, and argue that the standard pay-performance sensitivity estimates that fail to control for such volatility ought to be considered a lower bound of the “true” sensitivities. We believe that stock price volatility is probably less relevant to pay-performance sensitivities in China’s listed firms. As discussed in Section III, executive pay in China’s listed firms is based on annual contracts using annual data. Most listed firms in China have a short history of public trading and there is not a sufficiently long annual series of stock prices. In short, it is our belief that China’s listed firms are not mature enough to incorporate stock price volatility into their top management contracts. Even if it is the case, considering stock price volatility will make our pay-performance sensitivity estimates even more significant, and thus strengthen our main finding that there are significant pay-performance sensitivities in China’s listed firms.

⁵⁸ See Rosen (1990) for the origin of the term “semi-elasticity.”

⁵⁹ See, for example, Kaplan (1994), Kubo (2001), and Kato and Kubo (2003) for Japan; Kato, Kim and Lee (2004) for Korea.

where $DROA_{it}$ = change in ROA (pre-tax profit/assets ratio) of Firm i from Year $t-1$ to Year t ; $GSALES_{it}$ = rate of growth of sales of Firm i from Year $t-1$ to Year t (in percent);⁶⁰ and $NEGPROF_{it}=1$ if Firm i 's pre-tax profit is negative in Year t , 0 otherwise.⁶¹ Eq. (3)-(6) estimate the responsiveness of pay to the four performance variables individually whereas Eq. (7) considers all performance variables simultaneously and thus the estimated coefficient on each performance variable indicates the relative importance of each performance variable.⁶²

The OLS estimates of Eq. (3) through Eq. (7) are presented in Table 3. Consistent with our pay-performance sensitivity and elasticity estimates above, the estimated coefficients on ROR (or “semi-elasticities” of pay with respect to stock return) are positive and statistically significant and the magnitude of the estimated semi-elasticity is comparable to those found in Japan and Korea. The estimated coefficient on $GSALES$ (or sales growth) is also positive and statistically significant, with the size of the estimated semi-elasticity somewhat lower than what has been reported for Japan yet substantially higher than what has been reported for Korea.⁶³ Turning to accounting profitability measures, it appears that Chinese executives are not penalized for weak showing of ROA, nor are they rewarded for strong showing of ROA, although they do seem to be penalized when the firm makes negative pretax profit. Finally, the results do not change even when various alternative performance measures are considered simultaneously, pointing to the robustness of the results.

⁶⁰ We also try employment growth yet find no statistically significant link of employment growth to executive pay growth.

⁶¹ Sun and Tong (2003) argue that ROA is not an appropriate accounting performance measure due to a peculiar regulatory rule in China's stock market. Because listed firms in China are allowed to have rights issue up to 30% of their outstanding stocks annually and many companies take advantage of such a rule to increase equity capital even in the absence of investment opportunities. ROA, which decreases mechanically with such rights issue, does not reflect accurately the profitability of the firm. Instead, Sun and Tong (2003) suggest the use of ROS, or return on sales. We also use ROS instead of ROA in the regressions and obtain results very similar to those presented below. In addition, we try ROE (Return On Equity) and find equally similar results.

⁶² Kaplan (1994) also considered lagged performance variables. We too considered such lagged performance variables and found that our estimates without such lagged performance variables are robust. As such, our results do not appear to depend on the timing between an observed value for firm performance and the determination of executive compensation.

⁶³ See Kaplan (1994) and Kato, Kim and Lee (2004) for comparable estimates on the “semi-elasticity” of executive pay with respect to alternative firm performance measures in Japan and Korea.

Ownership Structure and Pay-Performance Link: Testing Hypotheses II and III

We now turn to the effects of ownership structure on how executive compensation is determined.⁶⁴ Specifically, to discern the impact on managerial contracts and incentives of ownership structure, we will first augment the standard pay-performance sensitivity and elasticity equations, Eq. (1) and Eq. (2), with GVTSHARE (percentage stock owned by the state) and an interaction term involving GVTSHARE and firm performance. That is,

$$(8) \Delta(\text{PAY})_{it} = a + b\Delta(\text{VALUE})_{it} + s_1(\text{GVTSHARE})_{it} + d_1\Delta(\text{VALUE})_{it}*(\text{GVTSHARE})_{it} \\ + (\text{year effects}) + u_{it}$$

$$(9) \Delta\ln(\text{PAY})_{it} = \alpha + \beta\ln(1+\text{ROR}_{it}) + \eta_1(\text{GVTSHARE})_{it} + \lambda_1\ln(1+\text{ROR}_{it}) *(\text{GVTSHARE})_{it} \\ + (\text{year effects}) + u_{it}$$

Table 5 presents the OLS estimates of Eq. (8) and Eq. (9). First, the estimated coefficient on the interaction terms in the sensitivity equation (d_1) is negative and statistically significant at the 1 percent level, suggesting that pay-performance sensitivities become stronger as the percentage of stock owned by the state falls. The magnitude of the impact of weakening state control is rather substantial. For example, a 1-percentage point decrease in GVTSHARE will result in an increase in the pay-performance sensitivity by 0.003 for the highest-paid three executives. This is hardly negligible, considering the estimated pay-performance sensitivities in this study as well as in earlier studies elsewhere range from 0.014 (the U.S.) to 0.034 (Japan) to 0.054 (China).⁶⁵ The negative impact on pay-performance link of state ownership is robust to the alternative elasticity specification and the estimated coefficient on the interaction term in the elasticity equation (λ_1) is negative and statistically significant at the 5 percent level, as shown in Column labeled Eq. (9) of Table 5.⁶⁶

⁶⁴ There is a growing literature on the link between ownership structure and executive compensation in advanced industrialized nations. See, for example, Core, Holthausen, and Larcker (1999), Ke, Petroni, and Safieddine (1999), Harvey and Shrieves (2001), Bertrand and Mullainathan (2001), Cyert, Kang and Kumar (2002) and Hartzell and Starks (2003) for the U.S.; Conyon (1997), Cosh and Hugh (1997), and Cragg and Dyck (2003) for the U.K.; Kato (1997) for Japan; Elston and Goldberg (2002) for Germany; Brunello, Graziano, and Parigi (2001) for Italy; and Randoy and Nielsen (2002) for Norway and Sweden. For transition economies, see for instance, Jones and Kato (1996, 1998) for Bulgaria; Jones and Mygind (2004) for Estonia; and Eriksson (2004) for Czech and Slovak Republics.

⁶⁵ See, Murphy (1999) and Kato and Kubo (2003).

⁶⁶ We also added a firm size variable (measured by sales growth) to our ownership structure regressions, and found no discernable changes. As such, the ownership structure results are not sensitive to whether we control

We interpret the negative and significant coefficients on the interaction terms involving state ownership and firm performance as evidence for the negative impact on executive pay-performance link (and hence the quality of corporate governance) of state ownership. However, an alternative interpretation reversing the causality is possible. Or, in their attempt to attract more capital from private investors including foreign investors, listed firms improve the quality of their corporate governance and signal such an improvement to private investors by making their executive pay-performance link stronger. As a result, those firms with stronger pay-performance link will end up attracting more private capital, making the percentage of stock owned by the state lower.

For several reasons, we think this reverse causality signaling interpretation is less relevant to listed firms in China. First, ownership structure appears to be less endogenous in the Chinese context for in general the introduction of different ownership structure is often policy-induced and motivated by political considerations rather than economic logic. For instance, Han (1997) discusses how the quota system plagued with political idiosyncrasies determines which companies get listed on the stock market and how many shares can be issued. In addition, reassuringly Sun and Tong (2003) report econometric evidence that state share ownership is not significantly affected by firm performance.

Moreover, to confirm that the reverse causality signaling interpretation may be less relevant to our Chinese listed firms, we consider two additional specifications. First, we re-estimate Eq. (8) and Eq. (9) using a lagged state ownership variable, $(GVTSHARE)_{it-1}$, with the results summarized in Table 6. The table shows that the percentage of stock owned by the state in the previous year is significantly related to the current pay-performance link, which is more consistent with the causality from ownership structure to pay-performance link than the reverse causality from pay-performance link to ownership structure.

We then limit our sample to include those listed firms in government targeted industries where they have guaranteed access to capital through the state and hence have little need to signal the high

for size.

quality of corporate governance (and strong pay-performance link) to private investors in order to attract private capital.⁶⁷ For these firms, the alternative signaling interpretation is less relevant. As Table 6 shows, in spite of a substantially reduced sample size (129), we still obtain statistically significant and negative coefficient on the interaction term involving firm performance and GVTSHARE in the elasticity specification and almost significant and negative coefficient in the sensitivity specification.

Overall, we believe we have obtained systematic evidence on the negative effect on executive pay-performance link of state ownership in China's listed firms. In addition, as mentioned before, given that firms with lower percentage of government shares tend to offer more company shares to their top executives, these results are expected to be robust even if equity holdings are taken into consideration when computing executive total compensation.

To test Hypothesis III, we consider the following two specifications. First, we modify Eq. (8) and Eq. (9) slightly by distinguishing LGPSHARE (percentage stock owned indirectly by the state via legal person shares) from STATESHARE (percentage stock owned directly by the state). That is,

$$(10) \quad \Delta(\text{PAY})_{it} = a + b\Delta(\text{VALUE})_{it} + s_1(\text{STATESHARE})_{it} + d_1\Delta(\text{VALUE})_{it} * (\text{STATESHARE})_{it} \\ + s_2(\text{LGPSHARE})_{it} + d_2\Delta(\text{VALUE})_{it} * (\text{LGPSHARE})_{it} + (\text{year effects}) + u_{it}$$

$$(11) \quad \Delta \ln(\text{PAY})_{it} = \alpha + \beta \ln(1 + \text{ROR}_{it}) + \eta_1(\text{STATESHARE})_{it} + \lambda_1 \ln(1 + \text{ROR}_{it}) * (\text{STATESHARE})_{it} \\ + \eta_2(\text{LGPSHARE})_{it} + \lambda_2 \ln(1 + \text{ROR}_{it}) * (\text{LGPSHARE})_{it} + (\text{year effects}) + u_{it},$$

The OLS estimates of Eq. (10) and Eq. (11) are summarized in Table 7. As shown in the table, the estimated coefficients on both $\Delta(\text{VALUE}) * \text{STATESHARE}$ and $\Delta(\text{VALUE}) * \text{LGPSHARE}$ are negative and statistically significant at the 1 percent level. This suggests that a decrease in either direct or indirect state ownership of listed firms will increase pay-performance sensitivities for executives. Moreover, the relative magnitudes of the estimated coefficients suggest that indirect state ownership is a greater hindrance to pay-performance sensitivities than direct state ownership (or a fall in the percentage stock

⁶⁷ Following the “Decision of the 4th Plenum of the CCP’s 15th Congress, as cited in Xiao (2003), we consider raw material and energy, public utilities, banking and finance, pharmaceutical, and agriculture as the “government targeted industries” where access to capital is guaranteed by the state.

owned indirectly by the state via legal person shares will result in a greater increase in pay-performance sensitivities than a comparable fall in the percentage stock owned directly by the state).

The OLS estimates of the elasticity specification, Eq. (11), confirm that the results are not sensitive to whether we use the sensitivity or elasticity specification.

Finally, to test Hypothesis III more directly, we estimate:

$$(12) \Delta(\text{PAY})_{it} = a + b\Delta(\text{VALUE})_{it} + s_1(\text{GVTSHARE})_{it} + d_1\Delta(\text{VALUE})_{it} * (\text{GVTSHARE})_{it} \\ + s_2(\text{STRATIO})_{it} + d_2\Delta(\text{VALUE})_{it} * (\text{STRATIO})_{it} + (\text{year effects}) + u_{it}$$

$$(13) \Delta \ln(\text{PAY})_{it} = \alpha + \beta \ln(1 + \text{ROR}_{it}) + \eta_1(\text{GVTSHARE})_{it} + \lambda_1 \ln(1 + \text{ROR}_{it}) * (\text{GVTSHARE})_{it} \\ + \eta_2(\text{STRATIO})_{it} + \lambda_2 \ln(1 + \text{ROR}_{it}) * (\text{STRATIO})_{it} + (\text{year effects}) + u_{it},$$

where STRATIO is STATESHARE/GVTSHARE. The sign and statistical significance of d_2 and λ_2 indicate whether given the percentage stock owned by the state, pay-performance link will become stronger when state ownership of a listed firms becomes more direct as opposed to indirect via legal person shares. The OLS estimates of Eq. (12) and Eq. (13) are shown in Table 8. The estimated coefficient on $\Delta(\text{VALUE})_{it} * (\text{STRATIO})_{it}$ is positive and statistically significant at the 1% level, suggesting that it is indeed the case that an increase in direct state ownership relative to indirect state ownership will lead to an increase in pay-performance sensitivities. As such, Hypothesis III is confirmed. The table also shows that similar yet slightly less significant results are obtained from the elasticity specification of Eq. (13).

Board Characteristics and Pay-Performance Link: Testing Hypotheses IV and V

To test Hypotheses IV and V, we estimate:

$$(14) \Delta(\text{PAY})_{it} = a + b\Delta(\text{VALUE})_{it} + s_1(\text{GVTSHARE})_{it} + d_1\Delta(\text{VALUE})_{it} * (\text{GVTSHARE})_{it} \\ + s_2(\text{BOARD})_{it} + d_2\Delta(\text{VALUE})_{it} * (\text{BOARD})_{it} + (\text{year effects}) + u_{it}$$

$$(15) \Delta \ln(\text{PAY})_{it} = \alpha + \beta \ln(1 + \text{ROR}_{it}) + \eta_1(\text{GVTSHARE})_{it} + \lambda_1 \ln(1 + \text{ROR}_{it}) * (\text{GVTSHARE})_{it} \\ + \eta_2(\text{BOARD})_{it} + \lambda_2 \ln(1 + \text{ROR}_{it}) * (\text{BOARD})_{it} + (\text{year effects}) + u_{it},$$

For BOARD, as discussed in Section II, we consider INDEPENDENT (proportion “independent directors”) and DUAL (dummy variable taking a value of one if the firm’s CEO is also the chairman of

the board of directors, zero otherwise). Since state ownership has been shown to be a significant determinant of pay-performance link, we include GVTSHARE and its interaction term. However, our results on the impact on pay-performance link of board characteristics are not sensitive to whether we further split GVTSHARE into STATESHARE and LGPSHARE or to whether we use the most parsimonious specification with no control for state ownership.

The OLS estimates of Eq. (14) and Eq. (15) are summarized in Table 9. We find no statistically significant effect on pay-performance link of board characteristics, confirming our expectation that “independent directors” in China’s listed firms are not really independent and hence ineffective in improving corporate governance of China’s listed firms and that the separation of the CEO position from the board chairmanship is also ineffective in improving corporate governance of China’s listed firms. Reassuringly the estimated coefficients on the interaction term involving board characteristics and firm performance are still insignificant even if we consider the difference between direct and indirect state ownership (specifically augmenting Eq. (10) and Eq. (11) with BOARD and its interaction term and augmenting Eq. (12) and Eq. (13) with BOARD and its interaction term). Moreover, the estimated coefficients on the interaction term involving board characteristics and firm performance are still insignificant when we consider the most parsimonious specification (or augmenting Eq. (1) and Eq. (2) with BOARD and its interaction term).

V. Conclusions and Policy Implications

Given that the goal of China’s SOE reform is to transform SOEs into modern corporations that can compete successfully in the global market, measuring the quality of corporate governance for Chinese firms will help evaluate the effectiveness of the reform. Since executive compensation is a major component of the firm’s incentive structure and at the core of the firm’s corporate governance, our study on executive compensation helps evaluate the quality of corporate governance and in turn the success of SOE reform in China. Since both economic theory and empirical evidence show that an efficient compensation system involves close links between firm performance and executive compensation, in this study we attempt to determine the existence and magnitude of such link in China’s listed firms.

We have found consistently for firms listed in China's emerging stock market statistically significant sensitivities and elasticities of cash compensation for the highest-paid executives with respect to shareholder value. The size of the estimated sensitivities and elasticities is comparable or greater than what has been found for other countries (particularly the U.S., Japan and Korea). Among other firm performance measures, we have found evidence that sales growth is linked to executive compensation in China's listed firms and that Chinese executives are penalized for making negative profit although they are neither penalized nor rewarded for changes in profit insofar as it is positive.

The significant pay-performance link for top management in China's listed firms is overall encouraging news for current policy makers in China who consider the shareholding scheme the cornerstone of their economic reform policy and view public listing in the stock market as a key mechanism of achieving such a goal for large SOEs.

However, not all news is good. First and perhaps most importantly, we have found that government ownership of China's listed firms is weakening pay-performance link for top managers and thus possibly making China's listed firms less effective in solving the agency problem, and such effects exist for both direct government ownership through state shares and indirect government ownership through legal person shares. Furthermore, evidence has been found that indirect ownership of listed firms by the state via legal person shares may weaken pay-performance link more than direct state ownership.

Lastly, we have found no evidence for the effectiveness of the gradualist measures to improve corporate governance (such as the promotion of the "independent" directorship and the separation between the CEO position and the board chairmanship).

These findings have important implications for China's enterprise reform. Listed firms in China seem to be aligning the interests between top managers and shareholders to a certain degree and such an interest alignment is stronger when accompanied by a reduction in government ownership of listed firms and thus a better defined bundle of property rights. Therefore, ownership restructuring may be needed for China to successfully transform its SOEs to efficient modernized corporations and reform its overall economy. Such ownership restructuring ought to be a wholesale conversion of state shares to public shares (shares owned by private individuals or private firms including foreign investors). Converting

state shares into domestic legal person shares via share transfers from the state to SOEs could be worse than maintaining direct ownership of listed firms by the state.⁶⁸

Finally, an alternative way to align the interests between top executives and shareholders is to tie their employment to firm performance. A full understanding of the incentive structure of top executives in China's listed firms will thus require an examination of the link between executive turnover and firm performance and how such a link is affected by ownership structure. To do so will require the collection of new data on top executive turnover in China's listed firms that can be matched with our CSMAR and Sinofin databases, a project we plan to do in the near future.⁶⁹

⁶⁸ There appears to be a new focus on direct state control of listed firms as compared to indirect state control via legal person shares as expressed in the "Temporary Policies for Supervising and Managing State-owned Assets in Enterprises" issued by the newly established State-owned Assets Supervision and Administration Commission (SASAC). Qiang (2003) makes a similar argument.

⁶⁹ There is yet another growing literature on executive turnover. Some of the literature examine specifically the link between executive turnover-performance sensitivities and ownership structure in industrialized countries: for instance, see Denis, Denis, and Sarin (1997) on the U.S.; Kaplan and Minton (1994), Kang and Shivdasani (1995), and Morck and Nakamura (1997) on Japan; Volpin (2002) on Italy; and Campbell, II. and Keys (2002) on Korea.

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Table 1: The Level of Executive Compensation and Key Firm Characteristics of China's Listed Firms, 1998-2002.

Variable	Mean	Standard Deviation	Observations
<i>Executive compensation</i>			
TOP THREE EXECUTIVE AVERAGE PAY (total annual salary for the highest-paid three executives divided by three)	97,474.220	101,249.100	1,917
TOTAL EXECUTIVE PAY (total annual salary for all directors, supervisors, and high-level executives)	838,733.900	876,794.600	1,917
AVERAGE EXECUTIVE PAY (TOTAL EXECUTIVE PAY divided by the number of all directors, supervisors and high-level executives)	77,145.180	76,132.010	1,917
<i>Key firm characteristics</i>			
Number of employees	3,336.687	14,462.350	1,901
Size of board of directors	9.719	2.466	1,917
Size of board of supervisors	4.321	1.386	1,917
INDEPENDENT (proportion "independent" directors)	0.143	0.132	1,914
DUAL (dummy variable taking a value of one if the firm's CEO is also Chairman of the board of directors, zero otherwise)	0.115	0.320	1,914
Number of directors, supervisors, and executives included in TOTAL EXECUTIVE PAY	11.192	5.463	1,917
Sales (in 1000 RMB)	1.38E+06	9.45E+06	1,917
VALUE (shareholder value in 1000 RMB)	1.70E+06	4.16E+06	1,917
ROR (stock return)	-0.138	0.248	1,917
ROA (pre-tax profit/assets)	0.013	0.324	1,917
NEGPROF=1 if the firm's pre-tax profit is negative, 0 otherwise	0.123	0.329	1,917
GVTSHARE (percentage of company shares owned by the state=STATESHARE+LGLPSHARE)	59.545	12.532	1,910
STATESHARE (percentage of company shares owned directly by the state)	32.771	27.100	1,910
LGLPSHARE (percentage of company shares owned indirectly by the state via "domestic legal persons shares")	26.774	25.545	1,910
STRATIO (STATESHARE/GVTSHARE)	0.538	0.417	1,910

Sources: Accounting and financial data are from the China Stock Market and Accounting Research Database (CSMAR) developed by Shenzhen GTA Information Technology Company. Data on executive compensation are from the database developed by Sinofin Information Services.

Note: The data are based on a pooled cross-sectional time series dataset on 923 listed firms over the sample period of 1998 to 2002. All compensation measures, VALUE, and Sales are adjusted for inflation using CPI (1995=100). VALUE and Sales are in thousands of 1995 RMB, while all compensation measures are in 1995 RMB.

Table 2: Summary Statistics of Variables Used in the Regressions

Variable	Mean	Standard Deviation	Observations
<i>Executive compensation</i>			
Δ (TOP THREE EXECUTIVE AVERAGE PAY)	14,292.720	215,754.600	943
Δ (TOTAL EXECUTIVE PAY)	179,293.800	689,027.800	975
Δ (AVERAGE EXECUTIVE PAY)	15,621.190	43,449.310	962
$\Delta \ln$ (TOP THREE EXECUTIVE AVERAGE PAY)	0.248	0.549	941
$\Delta \ln$ (TOTAL EXECUTIVE PAY)	0.261	0.513	975
$\Delta \ln$ (AVERAGE EXECUTIVE PAY)	0.237	0.471	962
<i>Stock performance</i>			
Δ (VALUE) (in 1000 RMB)	-2.260E+05	6.130E+05	1,033
ROR	-0.118	0.274	1,033
$\ln(1+ROR)$	-0.161	0.251	1,033
<i>Alternative firm performance measures</i>			
GSALES (rate of growth of sales from t-1 to t)	0.183	0.426	1,017
DROA (change in ROA from year t-1 to year t)	-0.026	0.432	1,033
NEGPROF	0.135	0.341	1,033
<i>Ownership Structure</i>			
GVTSHARE (percentage of company shares owned by the state=STATESHARE+LGLPSHARE)	59.408	12.615	1,030
STATESHARE (percentage of company shares owned directly by the state)	32.321	26.885	1,030
LGLPSHARE (percentage of company shares owned indirectly by the state via “domestic legal persons shares”)	27.087	25.521	1,030
STRATIO (STATESHARE/GVTSHARE)	0.533	0.415	1,030
<i>Board Structure</i>			
INDEPENDENT (proportion “independent” directors)	0.197	0.116	1,030
DUAL (dummy variable taking a value of one if the firm’s CEO is also Chairman of the board of directors, zero otherwise)	0.108	0.310	1,030

Sources: Accounting and financial data are from the China Stock Market and Accounting Research Database (CSMAR) developed by Shenzhen GTA Information Technology Company. Data on executive compensation are from the database developed by Sinofin Information Services.

Note: The data are based on a pooled cross-sectional time series dataset on 827 listed firms. All compensation measures, VALUE, and Sales are adjusted for inflation using CPI (1995=100). VALUE and Sales are in thousands of 1995 RMB, while all compensation measures are in 1995 RMB.

Table 3: Executive Pay-Performance Sensitivities and Elasticities in China's Listed Firms

Independent Variable	Eq. (1)	Eq. (2)	Eq. (1)	Eq. (2)	Eq. (1)	Eq. (2)
	Dependent Variable=					
	$\Delta(\text{TOP THREE EXECUTIVE AVERAGE PAY})$	$\Delta \ln(\text{TOP THREE EXECUTIVE AVERAGE PAY})$	$\Delta(\text{TOTAL EXECUTIVE PAY})$	$\Delta \ln(\text{TOTAL EXECUTIVE PAY})$	$\Delta(\text{AVERAGE EXECUTIVE PAY})$	$\Delta \ln(\text{AVERAGE EXECUTIVE PAY})$
$\Delta(\text{VALUE})$	0.054 (4.18)**		0.054 (1.40)		-1.08e-03 (0.43)	
$\ln(1+\text{ROR})$		0.363 (3.67)**		0.238 (2.66)**		0.146 (1.76)+
Observations	940	938	972	972	959	959
R-squared	0.019	0.020	0.004	0.013	0.005	0.006

Source and Variable Definitions: See Table 1.

Note: The data are based on a pooled cross-sectional time series dataset on 827 listed firms. All models include constant term and year dummy variables. All compensation measures are in 1995 RMB. Absolute value of t statistics in parentheses.

+ significant at 10%; * significant at 5%; ** significant at 1%

Table 4 Semi-Elasticities of Executive Pay with respect to Alternative Performance Measures in China's Listed Firms:

Independent Variable	Eq. (3)	Eq. (4)	Eq. (5)	Eq. (6)	Eq. (7)
	Dependent variable= $\Delta \ln(\text{TOP THREE EXECUTIVE AVERAGE PAY})$				
ROR	0.343 (3.40)**				0.290 (2.79)**
GSALES		0.179 (4.07)**			0.137 (2.98)**
DROA			0.057 (1.44)		0.016 (0.40)
NEGPROF				-0.176 (3.32)**	-0.103 (1.83)+
Observations	938	927	938	938	927
R-squared	0.018	0.024	0.009	0.018	0.037

Source and Variable Definitions: See Table 1.

Note: The data are based on a pooled cross-sectional time series dataset on 827 listed firms. All models include constant term and year dummy variables. All compensation measures are in 1995 RMB. Absolute value of t statistics in parentheses.

+ significant at 10%; * significant at 5%; ** significant at 1%

Table 5 Executive Pay-Performance Sensitivities and Elasticities, and State Ownership in China's Listed Firms

Independent variable	Eq. (8)	Eq. (9)
	Dependent variable=	
	$\Delta(\text{Top Three Executive Average Pay})$	$\Delta\ln(\text{Top Three Executive Average Pay})$
$\Delta(\text{VALUE})$	0.253 (4.56)**	
$\Delta(\text{VALUE}) * \text{GVTSHARE}$	-3.00e-03 (3.69)**	
$\ln(1+\text{ROR})$		1.235 (3.36)**
$\ln(1+\text{ROR}) * \text{GVTSHARE}$		-0.015 (2.46)*
GVTSHARE	-698.870 (1.15)	-0.003 (1.84)+
Observations	940	938
R-squared	0.033	0.027

Source and Variable Definitions: See Table 1.

Note: The data are based on a pooled cross-sectional time series dataset on 827 listed firms. All models include constant term and year dummy variables. VALUE is in thousands of 1995 RMB, while all compensation measures are in 1995 RMB. Absolute value of t statistics in parentheses

+ significant at 10%; * significant at 5%; ** significant at 1%

Table 6 Executive Pay-Performance Sensitivities and Elasticities, and State Ownership in China's Listed Firms: Accounting for an alternative signaling interpretation

Independent variable	Using lagged GVTSHARE		Considering only firms in targeted industries with guaranteed access to state capital	
	Eq. (8)	Eq. (9)	Eq. (8)	Eq. (9)
	Dependent variable=			
	$\Delta(\text{Top Three Executive Average Pay})$	$\Delta \ln(\text{Top Three Executive Average Pay})$	$\Delta(\text{Top Three Executive Average Pay})$	$\Delta \ln(\text{Top Three Executive Average Pay})$
$\Delta(\text{VALUE})$	0.244 (4.55)**		0.075 (1.65)+	
$\Delta(\text{VALUE}) * \text{GVTSHARE}$	-2.85e-03 (3.66)**		-9.68e-04 (1.63)	
$\ln(1+\text{ROR})$		1.215 (3.33)**		2.199 (2.54)*
$\ln(1+\text{ROR}) * \text{GVTSHARE}$		-0.014 (2.42)*		-0.032 (2.35)*
GVTSHARE	-538.150 (0.91)	-0.003 (1.82)+	-372.022 (0.88)	-0.007 (1.92)+
Observations	940	938	129	129
R-squared	0.033	0.027	0.043	0.070

Source and Variable Definitions: See Table 1.

Note: The data are based on a pooled cross-sectional time series dataset on 827 listed firms. All models include constant term and year dummy variables. VALUE is in thousands of 1995 RMB, while all compensation measures are in 1995 RMB. Absolute value of t statistics in parentheses + significant at 10%; * significant at 5%; ** significant at 1%.

Table 7 Executive Pay-Performance Sensitivities and Elasticities, and Direct and Indirect State Ownership in China's Listed Firms

Independent variable	Eq. (10)	Eq. (11)
	Dependent variable=	
	$\Delta(\text{Top Three Executive Average Pay})$	$\Delta \ln(\text{Top Three Executive Average Pay})$
$\Delta(\text{VALUE})$	0.318 (5.33)**	
$\Delta(\text{VALUE}) * \text{STATESHARE}$	-3.69e-03 (4.38)**	
$\Delta(\text{VALUE}) * \text{LGPSHARE}$	-5.36e-03 (4.70)**	
$\ln(1+\text{ROR})$		1.290 (3.48)**
$\ln(1+\text{ROR}) * \text{STATESHARE}$		-0.014 (2.31)*
$\ln(1+\text{ROR}) * \text{LGPSHARE}$		-0.017 (2.70)**
STATESHARE	-928.905 (1.52)	-0.003 (1.88)+
LGPSHARE	-1,007.291 (1.52)	-0.003 (1.68)+
Observations	940	938
R-squared	0.043	0.030

Source and Variable Definitions: See Table 1.

Note: The data are based on a pooled cross-sectional time series dataset on 827 listed firms. All models include constant term and year dummy variables. VALUE is in thousands of 1995 RMB, while all compensation measures are in 1995 RMB. Absolute value of t statistics in parentheses + significant at 10%; * significant at 5%; ** significant at 1%

Table 8 Executive Pay-Performance Sensitivities and Elasticities, and Direct and Indirect State Ownership in China's Listed Firms: An Alternative Specification

Independent variable	Eq. (12)	Eq. (13)
	Dependent variable=	
	$\Delta(\text{Top Three Executive Average Pay})$	$\Delta\ln(\text{Top Three Executive Average Pay})$
$\Delta(\text{VALUE})$	0.251 (4.56)**	
$\Delta(\text{VALUE}) * \text{GVTSHARE}$	-4.66e-03 (5.21)**	
$\Delta(\text{VALUE}) * \text{STRATIO}$	0.142 (4.13)**	
$\ln(1+\text{ROR})$		1.173 (3.16)**
$\ln(1+\text{ROR}) * \text{GVTSHARE}$		-0.016 (2.69)**
$\ln(1+\text{ROR}) * \text{STRATIO}$		0.298 (1.59)
GVTSHARE	-866.180 (1.42)	-0.003 (1.83)+
STRATIO	5,596.997 (0.30)	0.004 (0.08)
Observations	940	938
R-squared	0.053	0.031

Source and Variable Definitions: See Table 1.

Note: The data are based on a pooled cross-sectional time series dataset on 827 listed firms. All models include constant term and year dummy variables. VALUE is in thousands of 1995 RMB, while all compensation measures are in 1995 RMB. Absolute value of t statistics in parentheses + significant at 10%; * significant at 5%; ** significant at 1%

Table 9 Executive Pay-Performance Sensitivities and Elasticities, and State Ownership of China's Listed Firms: Accounting for an alternative signaling interpretation

Independent variable	BOARD=INDEPENDENT		BOARD=DUAL	
	Eq. (14)	Eq. (15)	Eq. (14)	Eq. (15)
	Dependent variable=			
	$\Delta(\text{Top Three Executive Average Pay})$	$\Delta \ln(\text{Top Three Executive Average Pay})$	$\Delta(\text{Top Three Executive Average Pay})$	$\Delta \ln(\text{Top Three Executive Average Pay})$
$\Delta(\text{VALUE})$	0.250 (4.20)**		0.260 (4.64)**	
$\Delta(\text{VALUE}) * \text{GVTSHARE}$	-3.02e-03 (3.69)**		-3.06e-03 (3.76)**	
$\Delta(\text{VALUE}) * \text{BOARD}$	0.023 (0.18)		-0.061 (0.94)	
$\ln(1+\text{ROR})$		1.164 (3.14)**		1.244 (3.38)**
$\ln(1+\text{ROR}) * \text{GVTSHARE}$		-0.017 (2.69)**		-0.015 (2.45)*
$\ln(1+\text{ROR}) * \text{BOARD}$		0.017 (1.28)		-0.047 (0.20)
GVTSHARE	-710.687 (1.17)	-0.003 (1.58)	-671.080 (1.10)	-0.003 (1.81)+
BOARD	50,286.630 (0.53)	0.444 (1.62)	6,882.929 (0.25)	0.037 (0.52)
Observations	938	938	938	938
R-squared	0.033	0.022	0.035	0.028

Source and Variable Definitions: See Table 1.

Note: The data are based on a pooled cross-sectional time series dataset on 827 listed firms. All models include constant term and year dummy variables. VALUE is in thousands of 1995 RMB, while all compensation measures are in 1995 RMB. Absolute value of t statistics in parentheses + significant at 10%; * significant at 5%; ** significant at 1%.