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Executive Compensation, Firm Performance, and State Ownership in China: Evidence from New Panel Data

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Abstract

This paper provides the first systematic evidence on compensation for executives of firms listed in China's emerging stock market (currently the eighth largest of the world with market capitalization of over $550 billion). Specifically, using comprehensive financial and accounting data on China's listed firms from 1998 to 2002 (data modeled after Compustat and CRSP in the U.S.), augmented by unique data on executive compensation, 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. The size of the estimated sensitivities imply that a 1000 RMB increase in shareholder value yields a 0.020 RMB to 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 3.7 to 4.0 percent increase in annual cash compensation for top executives. The estimated sensitivities and elasticities of cash compensation for top executives in China's listed firms are greater than what has been reported for Japan and the U.S. However, we also find that state ownership of China's listed firms is weakening executive pay-performance link and thus possibly making China's listed firms less effective in solving the agency problem. As such, ownership restructuring may be needed for the "shareholding experiment" to fully succeed in transforming China's emerging listed firms to efficient modernized corporations and for the overall successful economic transition of China. Finally, we 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.

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I. Introduction

One of the major challenges facing transition economies is how to transform state-owned enterprises (SOEs) into profitable modern firms.[1] After a series of enterprise reforms since the late 1970s failed to fundamentally improve the performance of its SOEs, China has started the development of a stock market in more recent years.[2] Stock exchanges were established in Shanghai at the end of 1990 and Shenzhen in early 1991, and the first Chinese company went public in 1991. Since then, China's stock market has progressed at an impressive pace. In 1997, the Chinese Communist Party's 15th Party Congress made the shareholding system a centerpiece of China's enterprise restructuring, providing further impetus for the development of the stock market.[3] Presently China's stock market is the eighth largest of the world with market capitalization of over $550 billion.[4]

Consistent with the Chinese government's other attempts at reforming SOEs without wholesale privatization, the development of the stock market in China was initially conceived as a way to raise capital and reduce debt burden for SOEs. When going public, these SOEs are required to issue shares to the government (referred to as state shares) as well as to other domestic institutions indirectly owned by the government such as business agencies and enterprises of local government (referred to as "legal person" shares). As a result, the persistent dominance of state ownership of company shares remains in many listed firms in the midst of the remarkable growth of the stock market and the government still looms large in the ownership as well as the control of most listed firms in China.[5]

Given the existence of different theories with contrasting predictions as well as conflicting empirical evidence regarding the influence of government ownership on firm performance, it is therefore not surprising that very different views exist in the literature as to

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[1] There are a number of excellent recent surveys of the literature on economics of transition in general. See for example Djankov and Murrell (2000), Megginson and Netter (2001), Svejnar (2002), and Estrin (2003).

[2] For a detailed discussion on China's enterprise reforms from a historic perspective, see Yang (1997).

[3] See Jefferson et al. (2003).

[4] 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%.

[5] See for instance Sun and Tong (2003).

whether the shareholding experiment has produced the desirable results of improving firm performance and enhancing corporate governance quality in China's listed firms.[6] Relying on disclosure information, Bai et. al (2003) finds evidence that listed firms with better corporate governance measures are associated with higher stock market valuation. More strikingly, the premiums related to better corporate governance are found to be substantially higher than those in other emerging markets in the world, suggesting that the Chinese stock market may be conducive to improving the quality of corporate governance in China's listed firms.

In contrast, Lin (2000) argues that China's corporatization program, spearheaded by the shareholding experiment, 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 author concluded 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. These findings are consistent with those by other researchers and policy makers in both China and international organizations.[7]

According to Lin (2000), the source of the 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. Since the stock market in China was initially introduced as a vehicle to help SOEs raise capital and improve performance, the majority of listed firms in China have been transformed from formerly state-owned enterprises (SOE) and have SOEs, or other state entities, as their controlling shareholders (Bai, et. al., 2003). Our calculation indicates that over eighty percent of the Chinese-listed firms had a state agency or a state-owned enterprise as their largest shareholder in 2003. It is thus likely that many listed firms are merely the reincarnations of SOEs that have inherited both inferior corporate governance and poor firm performance.

Clearly, 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

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[6] 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 theoretical studies as follows, "theory alone is thus unlikely to be conclusive in this respect."

[7] For example, see Schipani and Liu (2001).

undertaking serious attempts to implement privatization policies. Has the "shareholding experiment" led to substantial improvement of corporate governance in Chinese-listed firms? This paper contributes to this important policy debate by providing the first rigorous econometric evidence on the structure of executive compensation (in particular pay-performance relationships) in China's listed firms and how the firm's ownership structure (especially state ownership) affects these incentive mechanisms.

Economic theory predicts that inadequate executive incentives will lead to managerial behaviors that result in inefficient firm operations (Jensen and Meckling, 1976). Hence, a value-maximizing firm will strive to adopt efficient executive incentive systems, often appropriate compensation mechanisms, to induce managerial behaviors that are optimal for the interests of the shareholders. By studying whether this important component of the corporate governance structure responds to the firm's performance, one can gain some insight into how well the interests of shareholders are protected in the firm, thus obtaining an important measure of the quality of corporate governance.

For transition economies where competing reform policies are carried out to transform SOEs, tracking the sensitivity of executive compensation to firm performance is especially valuable in evaluating the effectiveness of various reform measures. While there has been an explosion in research on top management incentives (in particular pay-performance relationships) and corporate governance in U.S. firms in recent years,[8] systematic research outside of the U.S., in particular in emerging markets, is still in its infancy mostly due to the limited data availability.[9] Specifically, no reliable and systematic evidence on pay-performance relations and corporate governance is available for publicly traded firms in China, the largest emerging market in the world.[10]

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[8] See, for example, Murphy (1999) for an excellent survey of the mostly empirical literature on top management incentives; and Gibbons and Waldman (1999) for the largely 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).

[9] For recent exceptions, see Campbell and Keys (2003) and Kato, Kim and Lee (2004) on managerial incentives and corporate governance in Korea.

[10] Groves et al. (1995) examine a sample of SOEs in China in the 1980s (prior to the opening of stock exchanges in China), and present early evidence on the link between managerial pay and accounting measures of firm performance in pre-stock market China. 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.

This paper fills this important gap in the literature by providing the first rigorous study of how executive compensation relates to firm performance for publicly traded firms in China. To do so, we merge two firm-level panel data: (i) the Sinofin database that provide detailed information on executive compensation and corporate governance annually for all publicly traded firms in China since 1998; and (ii) the China Stock Market and Accounting Research (CSMAR) database that provides financial and accounting data annually for all publicly traded firms in China since 1992.

We find that compensation for top executives in China does respond to certain measures of company performance, suggesting that listed firms do adopt certain incentive mechanisms to induce managerial effort. However, the link of pay to shareholder wealth is stronger in firms with lower percentages of company shares owned directly or indirectly by the state, suggesting that the interest of top executives in more privatized firms is more in line with that of the shareholders and thus these companies operate more like firms in the West.[11] Our results seem to be consistent with the belief that the piecemeal enterprise reforms adopted in China will need to be supplemented by changes in ownership structures in order to ensure the successful transformation from SOEs into profitable modern corporations.[12]

The structure of the paper is as follows. Section II provides some background information on China's current corporate law and enterprise reforms. Section III describes data, followed by econometric specifications in Section IV. The main results are provided in Section V and Section VI concludes.

II. Corporate Law of 1993 and Enterprise Reforms in China

Two factors explain the lack of empirical evidence relating executive compensation to firm performance in China. First, except for the U.S. and the U.K. where the government

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[11] Dong and Putterman (2003) provide empirical support for a theory explaining why state ownership slows down the interest alignment process between top managers and shareholders, namely that state-owned enterprises in transition economies and thus their top executives are often required to pursue non-financial objectives such as employment provision. For a more formal theoretical argument, see Schmidt and Schnitzer (1993).

[12] For previous results on China suggesting the importance of ownership structure, 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.

imposes more stringent disclosure requirements on executive compensation of publicly traded firms, the availability of data on executive compensation is generally limited. China has not been an exception. Second, perhaps more importantly, until recently Chinese enterprises have differed considerably from corporations in countries such as the U.S. While western corporations have always been independent entities that focus primarily on maximizing profit, Chinese enterprises, and particularly SOEs, have traditionally been production plants that take orders from the state planners to fulfill the production plans of the government.

Although the Chinese government started to implement various policies aimed at improving the performance of its SOEs as early as the late 1970s, it was only after the Communist Party's 14th Congress in October 1992 that the state owned enterprise (SOE) reform became a major component of China's economic reform. While the series of earlier enterprise reforms were mainly designed to align the interests of SOE management and the government, such as the implementation of administrative decentralization and profit retention policies (*fangquan rangli*) in the late 1970s to the early 1980s, 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*), the Party's 14th Congress made clear that the goal of the new enterprise reform was to establish a modern corporation system that resembles corporations in the West. 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 modern Chinese corporations.

The Corporate Law of 1993 clearly stipulates shareholder rights including the right to investment interests, the right to make decisions regarding corporations' development strategies, and the right to hire management.[13] The Corporate Law recognizes two types of corporations: closely held corporations (Youxian Zeren Gongsi) and publicly held corporations (Gufen Youxian Gongsi). Both types of corporations are required to establish three statutory and indispensable 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

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[13] Corporate Law §1 (1993).

although a closely held corporation with "few shareholders" and "small capital size" can take exceptions to the rules.[14]

According to the Corporate Law, the final source of power in the corporation rests with the shareholder general meeting, which makes the final decisions in both the corporation's strategic planning and its top personnel decisions. Among the general meeting's multitude of prerogatives are the power to strategically plan the corporation's major operations and investment projects, the power to elect and change all members on the board of directors and a proportion of members on the board of supervisors, and the power to determine their compensation. Selected by the shareholders, the board of directors reports to the general meeting regarding the planning of the company's operations, investment, profit distribution, and company debt issuance. The board of directors also calls general meetings, implements resolutions by the general meeting, plans the company's operations and investment decisions, decides company's internal management structure, hires and fires CEO, hires and fires other members of the management at the recommendation of the CEO, and determines the compensation of the management.[15]

Compared to publicly traded firms in the U.S., a unique feature of corporate governance of publicly held Chinese corporations is the existence of the board of supervisors. The Corporate Law requires that a board of supervisors be established consisting of both shareholder representatives (selected by the shareholder general meeting) and company employee representatives, with the proportion of each group determined by the Company Charter (Gongsi Zhangcheng). The main power given to the board of supervisors is to audit the company's financial report, to oversee the behaviors of members on the board of directors or on the management, and to require any behaviors that violate the law or harm the company's interests to be corrected.

By clearly delineating the rights and responses of parties involved in a corporation, the passage of the Corporate Law of 1993 helped clear the way of SOE enterprise reform. Then in 1997, the Chinese Communist Party's 15th Party Congress further made the shareholding system a centerpiece of China's enterprise restructuring in an attempt to improve

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[14] 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).
[15] Corporate Law §3 (1993).

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the economic performance of large and medium-sized SOEs, leading to a rapid increase in the number of firms listed in the two stock exchanges in China. 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 not only has emerged as the eighth largest in the world with close to 1,300 listed firms and market capitalization of over $550 billions, but has also become the new frontier of China's enterprise reform.[16]

One main component of China's enterprise reform has been compensation reform. The rigid compensation system employed by pre-reform Chinese enterprises was one of the features that set these enterprises apart from firms in other countries. Before the economic reforms started in the late 1970s, compensation levels were completely based on seniority and job assignment in all Chinese SOEs and most other Chinese enterprises. Between 1950 and 1978, there was virtually no link between the employee's pay level and his or her productivity. In addition, for many employees the compensation level was kept fixed for long periods of time, sometimes for decades. After 1978, along with reforms in other areas, different forms of compensation reform have been experimented in order to promote better economic performance of SOEs. Beginning in 1994-1995, the compensation reform policy finally gave publicly listed companies virtually complete discretion in setting compensation levels for their employees.[17]

As a result of these enterprise and compensation reforms, Chinese corporations, especially firms listed on the two stock exchanges, have become much more comparable to corporations in other market economies. With the availability of newly collected data, it is now meaningful to explore how executive compensation in China responds to firm performance. Specifically, we will look at how executive compensation responds to company stock performance as well as how it responds to diverse alternative firm performance measures.

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[16] The government's policy stance to emphasize the role of the stock market and the listed firms in China's SOE reforms can be observed from numerous speeches given by policy makers in charge of enterprise reforms. 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.

[17] Corporate Law §3 (1993). For a detailed discussion on wage reforms in China, see Yueh (2004).

III. Data

We use financial data and corporate governance data provided by two Chinese information technology companies that specialize in collecting detailed information on firms listed in China's two stock exchanges: Shanghai Stock Exchange and Shenzhen Stock Exchange. Accounting and financial information is obtained from the China Stock Market and Accounting Research Database (CSMAR) developed by Shenzhen GTA Information Technology Company, which has been used in previous studies.[18] Executive compensation information is based on the database developed by Sinofin Information Services, which collects detailed executive compensation data from each listed firm's annual report since 1998. On our reading of the literature, we are the first to use this dataset in academic research.

The Sinofin database allows us to consider four different measures of executive compensation: (i) TOP THREE EXECUTIVE AVERAGE PAY (total annual cash compensation including salary and bonus[19] for the highest-paid three executives divided by three); (ii) TOP THREE DIRECTOR AVERAGE PAY (total annual cash compensation for the highest-paid three directors divided by three);[20] (iii) TOTAL EXECUTIVE PAY (total annual cash compensation for all directors, supervisors, and high-level executives); and (iv) AVERAGE EXECUTIVE PAY (TOTAL EXECUTIVE PAY divided by the number of all directors, supervisors and high-level executives).

TOP THREE EXECUTIVE AVERAGE PAY including pay for CEO and two other highest-paid executives (often vice CEOs) is probably closest to what most prior studies on executive compensation elsewhere use (typically CEO pay).[21] Some previous studies on

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

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

[20] Since not all directors are paid by the firm and not every firm has three or more paid directors, about 20% of the listed firms have fewer than three directors who receive compensation from the firm in our sample. For those firms with fewer than three paid directors, we divide total annual salary for all paid directors by the number of paid directors (which is one or two) instead of three.

[21] For a literature review of prior studies on U.S. CEO compensation, see for example Murphy (1999). The U.K. is one other country where CEO compensation data (strictly speaking, data on compensation for the highest paid director) 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

executive compensation (particularly in Japan and the U.K.) have also considered compensation for directors since many board directors also hold executive positions in the company. For Chinese-listed firms, such duality is particularly prevalent. For our sample, 84% of the listed companies have the same person as CEO and Chairman or Vice Chairman of the board of directors, while only 8% of all the board members are not affiliated with the company through employment or other business relations. In other words, the majority of the board members are insider managers. Thus, we predict that the agency theory applies also to members of the board of directors and such a prediction will be confirmed by estimating the relationship between TOP THREE DIRECTOR AVERAGE PAY and company performance.

Total compensation for executives include not only cash compensation (salary and bonus) but also other forms of compensation, such as equity holdings, stock options, and perquisites. However, the omission of these less visible forms of compensation may not pose as serious a problem as in the case of the U.S. First, stock holdings and stock options play only a minimal role in the compensation of Chinese executives. Stock options are simply not available in China, and the total company stock ownership of all board members averages only 0.014% of shares outstanding in 2002. For perquisites enjoyed by executives of China's listed firms, unfortunately, no reliable data are available at the moment.[22] Even if there exists considerable amount of these less visible forms of compensation, the neglect of these forms of compensation would not be a problem insofar as movements in these forms of compensation and cash compensation are correlated (Kaplan, 1994).

Finally, a few prior studies on Japan and Korea consider total compensation for all executives and average total compensation for all executives (total compensation divided by the total number of executives). Our data also provide such broad compensation measures, i.e., TOTAL EXECUTIVE PAY and AVERAGE EXECUTIVE PAY. Contrasting the pay-performance relations between such broad compensation measures and more narrowly defined executive compensation measures (including TOP THREE EXECUTIVE AVERAGE PAY and TOP THREE DIRECTOR AVERAGE PAY) is particularly interesting in the Chinese context, because TOTAL EXECUTIVE PAY and AVERAGE EXECUTIVE PAY include pay for not

CEO compensation.
[22] Liu and Otsuka (2004) report helpful institutional information on compensation packages provided for steel industry top executives in four provinces in China. We are currently collecting more detailed information on Chinese top executive pay packages nationally, encompassing diverse industries.

only highest-paid three executives and highest-paid three directors but also other high-level executives and members of the board of supervisors, many of whom are employee representatives (typically union leaders).[23] Due to their inclusion of supervisors (in particular employee representatives) and other executives, we expect that the pay-performance relations are weaker for these broader compensation measures.[24]

Table 1 reports descriptive statistics on the level of executive compensation and several key firm characteristics, where all value variables are adjusted for inflation using CPI (FY1995=100) and are thus expressed in 1995-constant RMBs.[25] Over the sample period of 1998-2002, the highest-paid three executives on average each earned about 97 thousand RMBs, while the highest-paid three directors on average each earned 107 thousand RMBs, slightly more than the highest-paid three executives. The highest-paid three executives and the highest-paid three directors earned about 12 times what the average worker in manufacturing earned. This ratio of top executive/average worker pay is substantially higher than what has been reported in other transition economies (Jones and Kato, 1996 and 1998 for Bulgaria, and Jones and Mygind, 2004 for Estonia). To see how the Chinese ratios compare to those in industrialized nations, we calculated the comparable ratio for Japan, using the average level of annual cash compensation for CEOs in Japan (reported in Kato and Kubo, 2004) and average manufacturing worker wage (compiled by the ILO). Interestingly, the comparable Japanese figure was around 7, substantially lower than what we found for top executives in China's listed firms. The Chinese figure is, however, still considerably lower than the comparable U.S. figure.[26]

As expected, when we include all directors, supervisors, and high-level executives, the average executive compensation of such a broader category of executives was 77 thousand RMBs, over 10 percent lower than the average highest-paid executives and the average highest-paid directors. The ratio of the average executive compensation of this broad category of

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[23] The 1999 listed firm survey conducted by the Shanghai Stock Exchange (Shanghai Stock Exchange 1999) finds that with 73.4% of the supervisory board chairs and the vast majority of supervisors serving in Chinese-listed firms are employee representatives.

[24] In the context of China, Fleisher and Wang (2003) find for their sample of township and village enterprises that the ratio between management wage and 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.

[25] These statistics were calculated based on a pooled cross-sectional time series dataset on 942 firms. They can be readily 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.

[26] See, for example, Kaplan (1994) and Murphy (1999) for the comparable U.S. figures.

executives to the average wage of workers in manufacturing is 7.6. Similar aggregate compensation data for all directors in recent years are reported in Kubo (2001) for Japan and Kato, Kim and Lee (2004) for Korea. Using these data and average manufacturing worker wage (compiled by the ILO), 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. Again the average executive in China's listed firms appears to be better paid (relative to the average worker in manufacturing) than its counterparts in Japan and Korea.

Table 1 also shows several key firm characteristics. 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.[27] 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. Finally, regarding ownership structure, a striking feature of these listed companies is that the majority of shares of a typical company (59.3%) are held by state owned enterprises and other state legal entities, among which 32.6% are state shares held directly by the state, often through SOEs, while 26.7% are indirectly held by the state through legal person shares.

IV. Econometric Specifications

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

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[27] In fact, according to our data, the average number of such directors and supervisors are 5.3 and 2.1 respectively.

shareholder value by regressing the change in the log of executive compensation on the change in the log of shareholder value of the firm. That is,

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

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

where PAY_{it} is the level of executive compensation of firm i in year t (measured by each of the aforementioned four compensation variables); $VALUE_{it}$ is shareholder value of firm i in year t; and ROR_{it} is stock return of firm i in year t.[28] 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 $u_{it} \sim NID(0, \sigma^2)$.[29]

Some prior studies on executive compensation (especially in countries outside of the U.S.) consider alternative performance measures, such as accounting performance measures as opposed to stock market performance measures, and estimate "semi-elasticities"[30] of pay with respect to such alternative performance measures. Following such prior studies on other Asian countries (Japan and Korea),[31] we estimate:

(3) $\Delta\ln(PAY)_{it} = \alpha + \beta_r ROR_{it} + $ (year effects) $+ u_{it}$

(4) $\Delta\ln(PAY)_{it} = \alpha + \beta_g GSALES_{it} + $ (year effects) $+ u_{it}$

(5) $\Delta\ln(PAY)_{it} = \alpha + \beta_d DROA_{it} + $ (year effects) $+ u_{it}$

(6) $\Delta\ln(PAY)_{it} = \alpha + \beta_n NEGPROF_{it} + $ (year effects) $+ u_{it}$

(7) $\Delta\ln(PAY)_{it} = \alpha + \beta_r ROR_{it} + \beta_g GSALES_{it} + \beta_d DROA_{it}$

$+ \beta_n NEGPROF_{it} + $ (year effects) $+ u_{it}$

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); and

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[28] As shown in Murphy (1999), $\Delta\ln(1+ROR_{it})$ is equal to $\Delta\ln(VALUE)_{it}$.
[29] 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.
[30] See Rosen (1990) for the "semi-elasticity.
[31] See, for example, Kaplan (1994), Kubo (2001), and Kato and Kubo (2003) for Japan; Kato, Kim and Lee (2004) for Korea.

NEGPROF$_{it}$ =1 if Firm i's pre-tax profit is negative in Year t, 0 otherwise.[32] 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.[33]

Finally, we will also study the effects of state ownership on executive compensation.[34] As discussed above, a defining feature of China's stock market is the large percentage of company shares owned directly or indirectly by the state. Given that the Chinese stock market was organized initially to raise capital for SOEs while maintaining the socialist feature of government ownership, state-owned shares and legal-person shares, which are indirectly owned by the government, account for a majority of the total shares in a typical listed company. Due to the various restrictions imposed on the trading of these state-owned and legal-person shares (both referred to as government-owned shares hereafter), the percentage of such shares provides important information on how effective the stock market can discipline these listed firms. Specifically, we estimate the following equations,

(8) $\Delta(\text{PAY})_{it} = a + b\Delta(\text{VALUE})_{it} + s(\text{GVTSHARE})_{it}$

$+ d\Delta(\text{VALUE})_{it}*(\text{GVTSHARE})_{it} + (\text{year effects}) + u_{it}$

(9) $\Delta\ln(\text{PAY})_{it} = \alpha + \beta\ln(1+\text{ROR}_{it}) + \eta(\text{GVTSHARE})_{it}$

$+ \lambda\ln(1+\text{ROR}_{it})*(\text{GVTSHARE})_{it} + (\text{year effects}) + u_{it},$

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[32] 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 to be presented below.

[33] 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.

[34] 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; and Randoy and Nielsen (2002) for Norway and Sweden. For transition economies, see for instance, Jones and Kato (1996, 1998) for Bulgaria and Jones and Mygind (2004) for Estonia.

where $(GVTSHARE)_{it}$ is the proportion of company shares that are directly or indirectly owned by the government. As discussed above, we expect the estimated coefficients on the interaction terms involving firm performance and government control of the firm (d and λ) to be negative, suggesting that more government-controlled listed firms are less exposed to the stock market than other listed firms and thus are less concerned about the formation of managerial incentives to align the interests of top management with the interests of shareholders.[35]

Although the state-owned shares and the 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. Chen (1998) finds evidence that state ownership positively affects firm performance, whereas legal-person ownership negatively affects firm performance. In contrast, Xu and Wang (1997) 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.

Given the mixed evidence on the effects of these two categories of government shares, we will explore empirically whether they have different impacts on the pay-performance relationship for top executives. Specifically, we will estimate the following:

(10) $\Delta(PAY)_{it} = a + b\Delta(VALUE)_{it} + s_1(STATESHARE)_{it} + d_1\Delta(VALUE)_{it}*(STATESHARE)_{it}$

$\qquad + s_2(LGPSHARE)_{it} + d_2\Delta(VALUE)_{it}*(LGPSHARE)_{it} + \text{(year effects)} + u_{it}$

(11) $\Delta\ln(PAY)_{it} = \alpha + \beta\ln(1+ROR_{it}) + \eta_1(STATESHARE)_{it} + \lambda_1\ln(1+ROR_{it})*(STATESHARE)_{it}$

$\qquad + \eta_2(LGPSHARE)_{it} + \lambda_2\ln(1+ROR_{it})*(LGPSHARE)_{it} + \text{(year effects)} + u_{it},$

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[35] There might be an endogeneity problem with GVTSHARE. However, we believe such an endogeneity problem is less severe in the Chinese context since 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 issues. Reassuringly Sun and Tong (2003) report econometric evidence that state share ownership is not significantly affected by firm performance.

where (STATESHARE)$_{it}$ is the proportion of company shares that are directly owned by the state, and (LGPSHARE)$_{it}$ is the proportion of company shares that are owned by the legal persons, or in other words, indirectly owned by the government. As discussed above, we are interested in whether the estimated coefficients on the interaction terms involving firm performance and government control of the firm (d's and λ's) will be different for the two types of government ownership, the direct versus indirect.

V. Results

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 923 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 923 firms in terms of all compensation and key firm characteristic variables listed in Table 1. The total number of observations in our pooled cross-sectional time series data used for the first-differenced regressions is 942, the bulk of which 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. Over the sample period the average annual pay raise was 15 to 27 thousands of 1995-constant RMB per individual, depending on whether he/she is among the highest-paid three executives, among the highest-paid three directors, or only among the broader category of executives. Likewise, executive compensation rose by 24 to 35 percent per year in real terms over the sample period, again depending on which of the above three categories the individual falls into. The table also shows an average fall of 2.6 percentage-points in ROA each year over the sample period. However, sales grew over the sample period by a robust 18.7 percent per year in real terms. The average likelihood of making a negative profit was about 13 percent. Finally, a typical firm included in the sample has about 32.3% of company shares owned directly and 26.8% indirectly by the state, and a total of 59.1% of company shared owned directly or indirectly by the state.

Table 3 presents the OLS estimates of Eq. (1) and Eq. (2) for each of the four compensation variables. As shown in the table, for the highest-paid three executives (TOP THREE EXECUTIVE AVERAGE PAY) and the highest-paid three directors (TOP THREE

DIRECTOR AVERAGE PAY), both estimated sensitivities and elasticities of pay with respect to shareholder value are positive and statistically significant at least at the 5 percent level. The size of the estimated sensitivities suggest that a 1000 RMB increase in shareholder value yields a 0.053 RMB increase in annual cash compensation for the highest-paid three executives and a 0.020 RMB increase in annual cash compensation for the highest-paid three directors.

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.[36]

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 not available for executives in listed firms in China, stock options constitute the bulk of executive compensation in the U.S. When stock options are taken into account in executive compensation, Jensen and Murphy (1990) estimate that a 1000 dollar increase in shareholder value leads 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.[37]

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

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

[37] 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.

percent increase in shareholder value results in 3.7 percent increase in annual cash compensation for the highest-paid three executives and 4.0 percent increase for the highest-paid three directors. Our elasticity estimates are considerably greater than what Kato and Kubo (2003) report for CEOs of listed firms in Japan in 1986-1995 and even greater than what Murphy (1999) reports for CEOs of S&P 500 Industrials in the U.S. in the first half of the 1990s.

In sum, there appears to be no evidence to suggest that cash compensation for top managers in China's listed firms is less sensitive to stock market performance of their firms as compared to companies in the U.S. and Japan.

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 highest-paid executives and directors.[38] As discussed before, the broad category of executives include not only the highest-paid directors and 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 and directors (such as CEOs and Chairman of the board of directors), and thus their compensation does not need to be as sensitive to firm performance as compensation for the highest-paid executives and directors.

Tables 4-1 presents the OLS estimates of Eq. (3)-Eq. (7) when we consider TOP THREE EXECUTIVE AVERAGE PAY as the dependent variable. Likewise, Tables 4-2 to 4-4 present the OLS estimates of Eq. (3)-Eq. (7) for the other three executive compensation variables. Not surprisingly and 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 (except for the case where AVERAGE EXECUTIVE PAY is used as the dependent variable and the estimated semi-elasticity is not quite significant). In

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[38] 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, TOP THREE DIRECTOR AVERAGE PAY and AVERAGE EXECUTIVE PAY.

addition to stock return, the estimated coefficients on GSALES (or sales growth) are consistently positive and statistically significant across all specifications. Note that our statistically significant estimates on the "semi-elasticities" of pay with respect to stock return and the "semi-elasticities" of pay with respect to sales growth are robust to whether we consider each performance measure individually or all performance measures together.

For Japan and Korea, comparable estimates on the "semi-elasticity" of executive pay with respect to stock return are available. Kaplan (1994) and Kato, Kim and Lee (2004) used aggregate executive compensation data similar to our TOTAL EXECUTIVE PAY and AVERAGE EXECUTIVE PAY and estimated the "semi-elasticities" of pay with respect to stock return for Japan and Korea. The size of the estimated semi-elasticities of TOTAL EXECUTIVE PAY and AVERAGE EXECUTIVE PAY to stock return in China is comparable to those found in Japan and Korea.

As shown in Tables 4-1 to 4-4, the estimated coefficients on GSALES are positive and statistically significant at the 1 percent level consistently for all specifications, suggesting highly significant "semi-elasticities" of pay with respect to sales growth. The size of the estimated coefficients in the nested specifications of Column (5) in Tables 4-1 to 4-4 implies that executive compensation will rise by 1.4-2.4 percent when his/her firm's sales grow by 10 percent. The size of the estimated semi-elasticities of pay with respect to sales growth in China is somewhat lower than what Kaplan (1995) reports for Japan yet substantially higher than what Kato, Kim and Lee (2004) report for Korea.[39]

Unlike the case of stock market performance in which pay-performance link is stronger for the highest-paid three executives and directors than for members of the board of supervisors and other non-top-level executives, the link between executive pay and sales appears to be equally strong for all executives. In other words, unlike stock market performance, higher sales growth tends to benefit not only top executives but also employee representatives in the board of supervisors and non-top-level executives. These seem to be reasonable results since we have no particular reason to believe that pay-sales link ought to be stronger for top executives and directors than for employee representatives and lower-level executives. The results are indeed

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[39] In fact, the estimated "semi-elasticities" of pay with respect to sales growth are not statistically significant in Korea according to Kato, Kim and Lee (2004).

consistent with the conventional belief that higher sales growth often means better job security, more opportunities for promotion and higher wages for employees and lower-level executives

Turning to accounting profitability measures, unlike in the U.S., Japan, and Korea where significant links between executive pay and ROA have been found, we find no such statistically significant link in China.[40] It appears that Chinese executives are not penalized for weak showing of ROA, nor are they rewarded for strong showing of ROA. However, we do observe some evidence of negative effects on executive pay of NEGPROF. In other words, executives may be penalized when the firm makes negative pretax profit, although such effects tend to disappear when other performance measures are included in the regressions.

The OLS estimates of Eq. (8) are summarized in Table 5-1. The estimated coefficients on Δ(VALUE)*GVTSHARE are negative and statistically significant at the 1 percent level when we use TOP THREE EXECUTIVE AVERAGE PAY and TOP THREE DIRECTOR AVERAGE PAY as the dependent variable. This suggests that a decrease in government ownership of listed firms will increase pay-performance sensitivities for the highest-paid three executives and directors. The agency problem appears to be better dealt with using stronger executive pay-performance sensitivities in less government-controlled firms.

The magnitude of the impact of weakening state control is rather substantial. For example, a 1-percentage point decrease in GVTSHARE (or the proportion of state-owned stock, both directly and indirectly) will result in an increase in the pay-performance sensitivity by 0.002 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 0.053 (China).[41]

The rest of Table 5-1 confirms that pay-performance link is weaker and less significant for the broader category of executives and so is the impact on pay-performance link of state ownership. As shown in Table 5-2, we also find some evidence on the significant negative impact on executive pay-performance link of government ownership when using pay-performance elasticities, although the estimates are somewhat less significant.

Table 6-1 provides the OLS estimates of Eq. (10). The estimated coefficients on both Δ(VALUE)* STATESHARE and Δ(VALUE)* LGPSHARE are negative and statistically

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[40] See, for instance, Kaplan (1994) and Kato and Kubo (2003) for Japan and the U.S.; Kato, Kim and Lee (2004) for Korea.

[41] See, Murphy (1999) and Kato and Kubo (2003).

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significant at the 1 percent level when we use TOP THREE EXECUTIVE AVERAGE PAY, TOP THREE DIRECTOR AVERAGE PAY or TOTAL EXECUTIVE PAY as the dependent variable. This suggests that a decrease in direct or indirect state ownership of listed firms will increase pay-performance sensitivities for executives and directors.

Table 6-2 provides the OLS estimates of Eq. (11). There is evidence that a decrease in either direct or indirect state ownership of listed firms will increase pay-performance elasticities for top three executives although the estimates are less significant as in the case of Eq. (9).

Overall, the negative impact on the pay-performance link of state ownership is statistically significant whether we consider direct or indirect state ownership.

VI. Conclusions and Policy Implications

This paper has provided the first evidence on how executive compensation relates to firm performance 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 and directors 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). As such, we have found no overall evidence that the agency problem is more poorly dealt with through pay-performance sensitivities in China's listed firms than in other countries (in particular neighboring economic power houses in Asia).[42]

However, we have found that 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. Among other firm performance measures, we have found strong evidence that sales growth is linked to executive compensation in China's listed firms and some evidence 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.

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[42] As discussed before, the bulk of pay-performance sensitivities for total executive compensation come from stock options in the U.S., the total sensitivities are considerably higher in the U.S. than in China. However, since stock options are still quite new to Japan and Korea and thus are much less developed than in the U.S., comparing the pay-performance sensitivities for cash compensation between China and Japan/Korea is indeed meaningful.

These findings have important implications for China's enterprise reform. The public trading of China's state owned enterprises is resulting in the better alignment of interests between top managers and shareholders and such an interest alignment is stronger when accompanied by a reduction in state ownership of listed firms. Therefore, ownership restructuring may be needed for the "shareholding experiment" to fully succeed in transforming China's emerging listed firms to efficient modernized corporations and for the overall successful economic transition of China.

Finally, an alternative way to align the interests between top executives and shareholders is to tie their employment to firm performance, or executive turnover-performance sensitivities. Thus, to fully understand the incentive structure of top executives in China's listed firms, we will need to examine the link between executive turnover and firm performance and how such a link is affected by state ownership. To do so will require the collection of new data on top executive turnover in China's listed firms which can be matched with our CSMAR and Sinofin databases.[43]

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[43] 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. We are currently exploring the feasibility of a similar study on China.

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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
Executive compensation			
TOP THREE EXECUTIVE AVERAGE PAY (total annual salary for the highest-paid three executives divided by three)	97,795.180	101,849.300	1927
TOP THREE DIRECTOR AVERAGE PAY (total annual salary for the highest-paid three directors divided by three)	107,428.700	114,676.700	1927
TOTAL EXECUTIVE PAY (total annual salary for all directors, supervisors, and high-level executives)	840,481.000	878,566.400	1927
AVERAGE EXECUTIVE PAY (TOTAL EXECUTIVE PAY divided by the number of all directors, supervisors and high-level executives)	77,204.960	76,037.620	1927
Key firm characteristics			
Number of employees	3,324.794	14,422.440	1912
Size of board of directors	9.720	2.463	1927
Size of board of supervisors	4.321	1.385	1927
Number of directors, supervisors, and executives included in TOTAL EXECUTIVE PAY	11.233	5.820	1927
Sales (in 1000 RMB)	1.37E+06	9.42E+06	1927
VALUE (shareholder value in 1000 RMB)	1.70E+06	4.15E+06	1927
ROR (stock return)	-0.138	0.248	1927
ROA (pre-tax profit/assets)	0.011	0.330	1927
NEGPROF=1 if =1 if the firm's pre-tax profit is negative, 0 otherwise	0.122	0.328	1927
GVTSHARE (percentage of company shares owned directly or indirectly by the state)	59.321	13.021	1927
STATESHARE (percentage of company shares owned directly by the state)	32.596	27.099	1927
LGPSHARE (percentage of company shares owned by "legal persons," which are indirectly owned by the state)	26.725	25.564	1927

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
Executive compensation			
Δ(TOP THREE EXECUTIVE AVERAGE PAY)	14,677.050	215,992.800	942
Δ(TOP THREE DIRECTOR AVERAGE PAY)	26,644.910	159,906.900	942
Δ(TOTAL EXECUTIVE PAY)	187,802.500	708,938.800	912
Δ(AVERAGE EXECUTIVE PAY)	15,860.010	455,68.030	901
Δ ln(TOP THREE EXECUTIVE AVERAGE PAY)	0.249	0.550	942
Δ ln(TOP THREE DIRECTOR AVERAGE PAY)	0.354	0.612	942
Δ ln(TOTAL EXECUTIVE PAY)	0.263	0.507	912
Δ ln(AVERAGE EXECUTIVE PAY)	0.241	0.480	901
Stock performance			
Δ(VALUE) (in 1000 RMB)	-2.54E+05	5.91E+05	942
ROR	-0.135	0.247	942
ln(1+ROR)	-0.176	0.234	942
Alternative firm performance measures			
GSALES (rate of growth of sales from t-1 to t)	0.187	0.408	931
DROA (change in ROA from year t-1 to year t)	-0.026	0.451	942
NEGPROF	0.131	0.337	942
Ownership structure			
GVTSHARE (percentage of company shares owned directly or indirectly by the state)	59.120	13.105	942
STATESHARE (percentage of company shares owned directly by the state)	32.295	26.901	942
LGLPSHARE (percentage of company shares owned by "legal persons," which are indirectly owned by the state)	26.825	25.329	942

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 of China's Listed Firms

	Eq. (1)	Eq. (2)	Eq. (1)	Eq. (2)	Eq. (1)	Eq. (2)	Eq. (1)	Eq. (2)
	Dependent Variable =							
	Δ(TOP THREE EXECUTIVE AVERAGE PAY)	Δln(TOP THREE EXECUTIVE AVERAGE PAY)	Δ(TOP THREE DIRECTOR AVERAGE PAY)	Δ ln(TOP THREE DIRECTOR AVERAGE PAY)	Δ(TOTAL EXECUTIVE PAY)	Δln(TOTAL EXECUTIVE PAY)	Δ(AVERAGE EXECUTIVE PAY)	Δ ln(AVERAGE EXECUTIVE PAY)
Δ(VALUE)	0.053 (4.13)**		0.020 (2.14)*		0.066 (1.57)		-1.53E-5 (0.01)	
ln(1+ROR)		0.369 (3.74)**		0.396 (3.61)**		0.243 (2.63)**		0.163 (1.84)+
Observations	942	942	942	942	912	912	901	901
R-squared	0.02	0.02	0.01	0.02	0.00	0.01	0.00	0.01

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 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 4-1: Semi-Elasticities of Executive Pay with respect to Alternative Performance Measures in China:
Dependent Variable= Δln(TOP THREE EXECUTIVE AVERAGE PAY)

	Eq. (3)	Eq. (4)	Eq. (5)	Eq. (6)	Eq. (7)
ROR	0.361 (3.49)**				0.294 (2.83)**
GSALES		0.185 (4.22)**			0.141 (3.07)**
DROA			0.058 (1.45)		0.015 (0.38)
NEGPROF				-0.184 (3.46)**	-0.113 (2.00)*
Observations	931	931	931	931	931
R-squared	0.02	0.03	0.01	0.02	0.04

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 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 4-2: Semi-Elasticities of Executive Pay with respect to Alternative Performance
Measures in China:
Dependent Variable= Δln(TOP THREE DIRECTOR AVERAGE PAY)

	Eq. (3)	Eq. (4)	Eq. (5)	Eq. (6)	Eq. (7)
ROR	0.424 (3.72)**				0.346 (3.04)**
GSALES		0.273 (5.69)**			0.244 (4.85)**
DROA			0.024 (0.55)		-0.023 (0.52)
NEGPROF				-0.160 (2.73)**	-0.061 (0.99)
Observations	931	931	931	931	931
R-squared	0.02	0.04	0.01	0.02	0.05

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
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 4-3: Semi-Elasticities of Executive Pay with respect to Alternative Performance
Measures in China:
Dependent Variable= Δln(TOTAL EXECUTIVE PAY)

	Eq. (3)	Eq. (4)	Eq. (5)	Eq. (6)	Eq. (7)
ROR	0.247 (2.56)*				0.187 (1.94)+
GSALES		0.203 (4.91)**			0.183 (4.21)**
DROA			0.021 (0.57)		-0.015 (0.38)
NEGPROF				-0.120 (2.40)*	-0.049 (0.92)
Observations	902	902	902	902	902
R-squared	0.01	0.03	0.01	0.01	0.04

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
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 4-4: Semi-Elasticities of Executive Pay with respect to Alternative Performance Measures in China:
Dependent Variable= Δln(AVERAGE EXECUTIVE PAY)

	Eq. (3)	Eq. (4)	Eq. (5)	Eq. (6)	Eq. (7)
ROR	0.145 (1.57)				0.079 (0.86)
GSALES		0.211 (5.40)**			0.194 (4.70)**
DROA			0.029 (0.82)		-0.006 (0.17)
NEGPROF				-0.127 (2.66)**	-0.053 (1.05)
Observations	891	891	891	891	891
R-squared	0.01	0.04	0.01	0.01	0.04

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 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 5-1: Executive Pay-Performance Sensitivities and GVTSHARE in China

	Eq. (8)	Eq. (8)	Eq. (8)	Eq. (8)
	Dependent Variable =			
	Δ(TOP THREE EXECUTIVE AVERAGE PAY)	Δ(TOP THREE DIRECTOR AVERAGE PAY)	Δ(TOTAL EXECUTIVE PAY)	Δ(AVERAGE EXECUTIVE PAY)
Δ(VALUE)	0.197 (3.97)**	0.150 (4.05)**	0.462 (2.80)**	0.003 (0.25)
GVTSHARE	-741.276 (1.23)	-458.770 (1.02)	-2,297.732 (1.13)	-139.494 (1.06)
Δ(VALUE)* GVTSHARE	-0.002 (3.01)**	-0.002 (3.63)**	-0.006 (2.48)*	-3.92E-05 (0.25)
Observations	942	942	912	901
R-squared	0.03	0.02	0.01	0.01

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: GVTSHARE is the sum of the percentage of company shares owned directly by the state (STATESHARE) and the percentage of company shares owned by "legal persons" (LGPSHARE), which are indirectly owned by the government. 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 5-2: Executive Pay-Performance Elasticities and GVTSHARE in China

	Eq. (9)	Eq. (9)	Eq. (9)	Eq. (9)
	Dependent Variable =			
	Δln(TOP THREE EXECUTIVE AVERAGE PAY)	Δln(TOP THREE DIRECTOR AVERAGE PAY)	Δln(TOTAL EXECUTIVE PAY)	Δln(AVERAGE EXECUTIVE PAY)
ln(1+ROR)	1.157 (3.21)**	0.868 (2.16)*	0.843 (2.49)*	0.632 (1.95)+
GVTSHARE	-0.003 (1.90)+	-0.003 (1.64)+	-0.002 (1.35)	-0.002 (1.47)
ln(1+ROR)* GVTSHARE	-0.013 (2.26)*	-0.008 (1.21)	-0.010 (1.84)+	-0.008 (1.50)
Observations	942	942	912	901
R-squared	0.03	0.02	0.02	0.01

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: GVTSHARE is the sum of the percentage of company shares owned directly by the state (STATESHARE) and the percentage of company shares owned by "legal persons" (LGPSHARE), which are indirectly owned by the government. 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 6-1: Executive Pay-Performance Sensitivities and STATESHARE vs. LGPSHARE in China

	Eq. (10)	Eq. (10)	Eq. (10)	Eq. (10)
	Dependent Variable =			
	Δ(TOP THREE EXECUTIVE AVERAGE PAY)	Δ(TOP THREE DIRECTOR AVERAGE PAY)	Δ(TOTAL EXECUTIVE PAY)	Δ(AVERAGE EXECUTIVE PAY)
Δ(VALUE)	0.241 (4.56)**	0.178 (4.56)**	0.537 (3.05)**	0.003 (0.26)
STATESHARE	-939.099 (1.53)	-569.519 (1.26)	-2,549.346 (1.23)	-147.836 (1.11)
Δ(VALUE)* STATESHARE	-0.003 (3.50)**	-0.002 (4.07)**	-0.007 (2.70)**	-4.32E-05 (0.27)
LGPSHARE	-982.713 (1.47)	-553.107 (1.12)	-3,075.962 (1.37)	-116.372 (0.81)
Δ(VALUE)* LGPSHARE	-0.004 (3.88)**	-0.003 (4.03)**	-0.009 (2.65)**	-4.35E-05 (0.19)
Observations	942	942	912	901
R-squared	0.02	0.03	0.01	0.01

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: STATESHARE is the percentage of company shares owned directly by the state, while LGPSHARE is the percentage of company shares owned by "legal persons." 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 6-2: Executive Pay-Performance Elasticities and STATESHARE vs. LGPSHARE in China

	Eq. (11)	Eq. (11)	Eq. (11)	Eq. (11)
	Dependent Variable =			
	Δ(TOP THREE EXECUTIVE AVERAGE PAY)	Δ(TOP THREE DIRECTOR AVERAGE PAY)	Δ(TOTAL EXECUTIVE PAY)	Δ(AVERAGE EXECUTIVE PAY)
ln(1+ROR)	1.228 (3.36)**	0.875 (2.18)*	0.834 (2.44)*	0.635 (1.94)+
STATESHARE	-0.004 (2.02)*	-0.004 (1.97)*	-0.003 (1.64)+	-0.003 (1.76)+
ln(1+ROR)* STATESHARE	-0.013 (2.17)*	-0.008 (1.24)	-0.010 (1.86)+	-0.008 (1.54)
LGPSHARE	-0.003 (1.77)+	-0.002 (0.82)	-0.001 (0.66)	-0.001 (0.75)
ln(1+ROR)* LGPSHARE	-0.016 (2.50)*	-0.007 (0.99)	-0.009 (1.45)	-0.007 (1.20)
Observations	942	942	912	901
R-squared	0.03	0.03	0.02	0.02

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: STATESHARE is the percentage of company shares owned directly by the state, while LGPSHARE is the percentage of company shares owned by "legal persons." 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%

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