

**CEO Turnover, Firm Performance,
and Enterprise Reform in China:
Evidence from New Micro Data**

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Takao Kato and Cheryl Long**

May 2005

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Abstract

Using comprehensive financial and accounting data on China's listed firms from 1998 to 2002, augmented by unique data on CEO turnover, ownership structure and board characteristics, we estimate Logit models of CEO turnover and find that: (i) even if the firm is listed in the stock exchanges, there is no significant and negative link between CEO turnover and firm performance unless there is a large controlling shareholder; (ii) turnover-performance sensitivities are stronger for privately-controlled listed firms than for state-controlled listed firms and are the strongest when the large controlling shareholder is a private firm or individual; (iii) the listing suspension mechanism, i.e., the ST designation, adopted by China's securities regulatory agency, is effective in improving the performance-turnover link in Chinese listed firms; (iv) the appointment of independent directors enhances turnover-performance sensitivities; (v) turnover-performance sensitivities are weaker for listed firms with CEOs who also hold positions in the controlling shareholders; and (vi) firm performance improves significantly after the replacement of the CEO and the improvement is greater for privately controlled firms than for state controlled firms. Consistent with the "law and finance" approach to corporate governance and the literature on economic reform in general, our findings suggest that any fundamental improvement in China's corporate governance will require a broad program that encompasses not only privatization but also laws and their effective implementation to provide better protection for investors.

Keywords: executive turnover, firm performance, enterprise reform, corporate governance, ownership structure, China, and transition economies.

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

CEO Turnover, Firm Performance, and Enterprise Reform in China: Evidence from New Micro Data

Section 1: Introduction

Executive turnover and its link to firm performance have been the focus of a large and growing literature since they provide a crucial measure of how effective a firm solves the two sets of principal-agent problems it faces: (i) diverging interests between top management and shareholders, which may result in managerial entrenchment; and (ii) diverging interests between the controlling shareholders and the minority shareholders, which may lead to the expropriation of the latter by the former or “tunneling,” as referred to in the literature.¹ Specifically, tying the personal fortune of top executives to the performance of the firm aligns the interests of the shareholders and those of the management. It also breaks up the “insider” alliance between the controlling shareholder and the management and therefore helps protect the interests of outside investors (or minority shareholders). As such, executive turnover-performance sensitivities can serve as an important indicator of how well the corporate governance system functions.

In this paper, we study such link of executive turnover to firm performance in Chinese listed firms and provide the first systematic evidence on the turnover-performance sensitivities of Chinese top executives. By now a large literature has been developed on executive turnover, mostly on U.S. firms and increasingly on firms in other industrialized countries as well.² There is, however, relatively limited evidence on developing and transitional economies.³ In particular, no turnover-performance sensitivity estimate is available for China, which is presently the largest transition economy in the world.⁴ By early 2004, China’s stock market has emerged as the eighth

¹ See for instance Bebchuk (1999), Bebchuk, Kraakman, and Triantis (1999), Johnson et al. (2000), and Volpin (2002).

² For a review of the earlier literature on executive turnover which tends to focus on the U.S., the U.K., Japan and Germany, see Murphy (1999). For studies on other industrialized countries, see for instance Volpin (2002) and Brunello, Graziano and Parigi (2003) on Italy; Suchard, Singh and Barr (2001) on Australia; Zhou (2000) on Canada; Lausten (2002) and Neumann and Voetmann (2005) on Denmark; and Campbell and Keys (2002) on South Korea.

³ Studies on other developing and transitional economies include Claessens and Djankov (1999, 2002), Muravyev (2003), Eriksson (2004), Gibson (2003), Defond and Hung (2004), and Klapper and Love (2004).

⁴ There are a few previous studies on link of executive compensation to firm performance in China which 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, Liu and Otsuka, 2004, and Mengistae and Xu, 2004). 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-

largest in the world with close to 1,300 listed firms and market capitalization of over \$550 billions.⁵ By focusing on China's listed firms, our paper therefore attempts to fill possibly the greatest gap in the large and growing literature on executive turnover.

Perhaps more importantly, China is an ideal case for a study of internal corporate governance including CEO turnover for at least two reasons. Firstly, the internal disciplinary mechanism that determines CEO turnover is particularly important due to the lack of effective markets for corporate control in China.⁶ In addition, both types of agency problem are acute in China due to the poorly defined property right and weak investor protection (resulting in part from the legacy of the command economy). Volpin (2002) regards Italy as an ideal case for a study of top executive turnover in the absence of strong investor protection. We argue that the Chinese case adds an important new dimension to the issue of investor protection and agency problems, i.e., the majority shareholders are often the state with a complex set of objectives. As such, a careful study of top executive turnover in Chinese listed firms will provide new insights into how the two types of agency problems play out in a transitional economy where state control of listed firms is still paramount.

Specifically, using 1998 to 2002 financial and accounting data on China's listed firms, augmented by unique data on CEO turnover, ownership structure and board characteristics, we find that: (i) even if the firm is listed in the stock exchanges, there is no significant and negative link between CEO turnover and firm performance unless there is a large controlling shareholder; (ii) turnover-performance sensitivities are stronger for privately controlled listed firms than for state-controlled listed firms and are the strongest when the large controlling shareholder is a private firm or individual; (iii) the listing suspension mechanism, i.e., the ST designation, adopted by China's securities regulatory agency is effective in improving the performance-turnover link in Chinese listed firms; (iv) the appointment of independent directors also enhances

performance link while others including autonomy in production and sales decisions do not.

⁵ 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%.

⁶ Some Chinese listed firms have experienced changes in their controlling shareholders. However, these changes differ substantially from corporate takeovers in the West. The three main methods of control change in China include negotiated ownership transfer paid by cash, negotiated ownership transfer through asset swaps, and ownership transfer without payment. All three methods are heavily regulated or orchestrated by the government. (For more detailed discussion on corporate control changes in China, see Cai and Chen 2004.)

turnover-performance sensitivities; (v) turnover-performance sensitivities are weaker for listed firms with CEOs who also hold positions in the controlling shareholders; and (vi) firm performance improves significantly after the replacement of the CEO and the improvement is greater for privately controlled firms than for state controlled firms.

Our findings appear to paint a mixed picture of China's corporate governance. On the one hand, many firms in China seem to be plagued with a low quality of corporate governance. In particular, for listed firms controlled by the state, if the controlling shareholder does not have more than 50% of the company shares and no independent directors serve on its board, then there is no significant link between firm performance and its CEO turnover.

On the other hand, the substantially stronger performance-turnover link observed in privately controlled firms suggests that a speed-up of the privatization process in China will lead to further improvement in its corporate governance, confirming the benefits from privatization.⁷ In addition, a few specific measures adopted by the Chinese Securities Regulatory Commission (the CSRC hereafter) seem effective in strengthening the performance-turnover tie. Both the introduction of the ST designation and independent directors are found to boost the link between firm performance and CEO turnover. Thus to the extent that such link indicates better corporate governance, these CSRC measures have seen some success in enhancing the disciplinary functions of the stock market.

More broadly, these findings are consistent with the agency literature, especially the hypothesis developed and tested in the "law and finance" approach to corporate governance that weak protection for outside investors leads to poor corporate governance (La Porta, Lopez-de-Silanes, and Shleifer 1999, and La Porta et al. 2000). In particular, the presence of a large controlling shareholder is found to strengthen the link of CEO turnover to firm performance, while the lack of independent directors and the presence of a CEO who simultaneously holds a position in the controlling shareholder firm are both found to weaken the link. These findings provide support for the hypothesis that the second type of agency problem is particularly acute where investor protection is weak.⁸ In China, where explicit protection for private property rights

⁷ For a discussion on the costs from delaying the privatization process in China, see for example Lardy (1998). For specific studies suggesting the importance of ownership reform 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.

⁸ For empirical evidence from East Asian countries that supports this hypothesis, see Claessens, Djankov,

was not instituted in the Constitution until 1999, one would not expect the conflict between the controlling shareholder and minority outside shareholders to be resolved effectively.

In other words, the continuous difficulty faced by Chinese listed firms in solving the two types of principal-agent problems seems to be fundamentally a result of the weak protection provided by China's legal system to investors. Like many other developing countries, China does not have either a comprehensive set of legal rules that provide protection for outside investors or the ability to effectively implement existing laws that govern the operations of corporations and securities market. In addition, China's problem is further compounded by its socialist legacy. The state ownership of the majority of listed company stocks implies that the protection for even the largest investor, the state, is also weak due to the ambiguity of public property rights.

As weak protection of investors implies poor quality of corporate governance in Chinese listed firms, any fundamental improvement in China's corporate governance will thus require a broad program that encompasses not only privatization but also laws and their effective implementation to provide better protection for investors.⁹

The structure of the paper is as follows. In Section 2, we will present background information on the current Chinese corporate governance system and develop testable hypotheses. The data and empirical strategy are discussed in Section 3, followed by Section 4 where econometric specifications are laid out and the estimates are presented. Section 5 concludes.

Section 2: Background information and testable hypotheses

This section provides background information on China's stock market and listed firms, and develops hypotheses to be tested in the paper.

2.1 Two key features of China's stock market and main hypotheses

The first feature Chinese listed firms have in common is the highly concentrated ownership structure. On average, the proportion of company stock owned by the largest

and Lang (2000).

⁹ Wu (2003) makes a similar argument.

shareholder is more than 44%, and over 42% of listed firms have a controlling shareholder owning more than half of the company stock. This degree of concentration is both a reflection of the state's reluctance to let go of its control of the former SOEs and a response of privately controlled firms to the weak protection for outside investors.

Concentration of both control and ownership of listed firms is prevalent in countries with weak protection for investors and is argued to be a rational response by private entrepreneurs to the lack of investor protection (La Porta et al. 2000). Among other reasons for choosing such concentration, a larger stake in the company gives the controlling shareholder more incentives to monitor the management and thus leads to higher performance-turnover sensitivities. It is worth pointing out that the same argument applies to listed firms controlled by all types of shareholders. Therefore, to the extent that the state cares about firm performance among other things, a higher concentration of state ownership presumably will also lead to more effective corporate governance measures such as a stronger link between firm performance and executive turnover. Our first main hypothesis, therefore, is:

*Hypothesis I: The presence of a large controlling shareholder makes CEO turnover more sensitive to firm performance.*¹⁰

The above hypothesis applies to any country where investor protection is weak, be it China or Italy. Our second hypothesis, however, is unique to transitional economies like China, where the state ownership and control still loom large. The dominance of state ownership and control in China's listed firms is fundamentally due to the Chinese government's delay in privatization. Since their very beginning in the early 1990s, the stock exchanges in Shanghai and Shenzhen were conceived and designed primarily to help SOEs raise capital and reduce debt burden, rather than serving as the channel for efficient resource allocation. To achieve the goal of raising funds for SOEs, until 2000 public listing has required quotas, which were reserved almost exclusively for SOEs. It is thus only natural that the vast majority of listed firms in China are spin-offs of SOEs.

Although the policy of "grasping the big and letting go of the small," adopted at the Chinese Communist Party's 15th Party Congress in 1997, vowed support for privatization of small SOEs and opened the door for ownership restructuring for large SOEs, the ownership

¹⁰ Volpin (2002) develops and tests a similar hypothesis using Italian data.

restructuring of Chinese listed firms has been slow.¹¹ In 2003, the government still remains the largest shareholder in over 80% of the listed firms, either directly by owning state shares or indirectly by owning legal person shares, which together constitute about two thirds of the company stock of all listed firms.¹²

For the reasons discussed below, the dominance of state ownership will have negative implications for meaningful SOE reform and the further development of China's stock market. First, state ownership suffers from the separation between ownership by the general public and control by the bureaucrats in charge of the daily operations of the firm. Because the bureaucrats may have very different goals from the general public, there exists inherent conflict of interests between the owners and the management (Shleifer and Vishny 1997). Secondly, even if the state is able to hold the bureaucrats accountable for implementing its goals in operating the state-owned firms, the multiple and oftentimes conflicting social objectives pursued by the state imply that the firm's economic performance often has to be sacrificed to achieve other "higher" social goals such as full employment. Furthermore, the state and legal person shares of Chinese listed firms held directly or indirectly by the government are non-tradable shares and any transfer of these stocks has to be approved by numerous government agencies including both the CSRC and the Ministry of Finance. This greatly weakens the market's disciplinary function through takeover since without the government's approval there is virtually no threat of an alternative

¹¹ The Chinese government has long been delaying the privatization process in its enterprise reforms until very recently. In the 1970s and 1980s, Chinese SOE reform measures were mainly designed to align the interests of SOE management with the interests of 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). Beginning in the early 1990s, increasingly bolder SOE reform measures were implemented. The Chinese Communist Party's (the CCP) 14th Congress held in 1992 called for establishing a modern corporation system similar to the West spurred the stock market's rapid development in China since 1992. In contrast to the largely gradualist 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 more radical changes including corporate and ownership structure changes. Following the 14th Congress, the National Peoples' Congress (NPC) and its Standing Committee passed the Corporate Law in 1993, which laid out the essential rules for corporate governance in modern Chinese corporations and provided blueprints for later SOE reforms. The major breakthrough in terms of ownership changes occurred in 1997, when the Chinese Communist Party's 15th Party Congress made the shareholding system a showpiece of China's enterprise reform and public listing a main mechanism to attain 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. The growth of the stock market was further aided by the passage of the Securities Law in 1998. For China's delay in privatizing its SOEs, see Huang (2003). For a general discussion on enterprise reform in transition economies, see Megginson and Netter (2001).

¹² Unless noted otherwise, numbers cited in this paper are computed from the GTA and Sinofin data bases by the authors. For similar estimates for different types of share percentages, see, for instance, Qiang (2003).

management team that can offer a better return for the current firm's asset, no matter how unsatisfactory the firm's performance is.

All these facts lead to weak incentives for state owned firms to aggressively pursue profit maximization and increase the firm's market value. It is to be expected, therefore, that these firms will lack corporate governance measures that link firm performance with the fortune of the CEO.¹³ In particular, they will not have strong link between firm performance and CEO turnover.

In addition, most of the firms controlled by the government still follow the same routine as SOEs in their top personnel decisions. Depending on the management level of the SOE, the government of the corresponding level has the authority to appoint its top management. For SOEs at the central government level, for example, the central government's CCP (Communist Party of China) Department of Organization has the final say in the selection of its CEO or the General Manager; for SOEs in the charge of provincial government, the Department of Organization at the provincial government calls the shots.¹⁴

For the listed firms that have the government or SOEs as their largest shareholders, the same procedures tend to apply. According to China's Corporate Law, the personnel decisions are supposed to be made by the board of directors. However, in reality, the candidates for the Chairman of the board of directors and the General Manager are almost always nominated by the largest government shareholders and then rubber-stamped by the board. The multiplicity of the goals of the government thus implies that economic performance of the firm will often become secondary to political pressures and social connections in making personnel decisions. Thus, our second main hypothesis is:

Hypothesis II: Sensitivities of CEO turnover to firm performance are lower for listed firms still controlled by the state than for privately-controlled listed firms.

2.2 Other hypotheses: the role of CSRC and "insider" control

In addition to the two main features of China's stock market, we also consider three potentially important factors which may affect the quality of corporate governance in China: ST-

¹³ 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).

¹⁴ Our discussion on the personnel appointment process is largely based on the surveys and interviews conducted in Beijing, Shanghai, and Chengdu, Sichuan in the summer of 2004.

designation, independent directors, and insider CEOs. The first and the second factors are measures introduced by the CSRC to improve corporate governance in China, while the second factor and the third factor testify to the prevalence of “insider” control and the severity of the second type of agency problem in Chinese listed firm.

First, we study the effectiveness of a listing suspension measure adopted by the CSRC to improve corporate governance. In 1998, the CSRC introduced the ST designation policy to the Chinese stock market. Under the CSRC guidelines, a firm may become an ST firm for a variety of reasons such as experiencing net loss for two consecutive years or failing to keep the shareholders’ equity above the registered capital. In general the CSRC uses the ST designation to warn firms with serious financial difficulties or certain abnormalities, because these troubles usually put investors’ interest at stake. Following the ST designation, the firms will be forced out of the stock market (i.e. “de-listed”) if their performance does not improve in two years. Meanwhile, the ST firms will receive more strict scrutiny from regulators. Facing such pressing risk of delisting, the ST firms usually have a strong incentive to reform so that they can improve their performance and rid themselves of ST labels.¹⁵

The ST designation serves as a warning system in principle and hence a mechanism to motivate poorly performing firms with weak corporate governance to improve their corporate governance. Hence, our hypothesis is:

Hypothesis III: Prior to the ST designation, the ST firms tend to have weaker performance-turnover links compared to other firms; Subsequent to the ST designation, however, performance-turnover ties will be strengthened for the ST-designated firms.

In their effort to improve corporate governance in China, the biggest challenge faced by the CSRC is “insider” control. Although ownership concentration and the consequent “insider” control help reduce the principal-agent problem between owners and the management, particularly in countries with poor protection of outside investors, it also aggravates the conflict of interests between the controlling shareholder and the minority shareholders (La Porta, Lopez-de-Silanes, and Shleifer, 1999).¹⁶ We develop two hypotheses concerning how well Chinese listed firms resolve the agency problem between the controlling shareholder and outside investors.

¹⁵ See Bai et al. (2003) for more details.

¹⁶ See also Bebchuk (1999) and Bebchuk, Kraakman, and Triantis (1999).

According to China's Corporate Law, the board of directors represents the interests of all the shareholders. But in reality, the board of directors in Chinese listed firms is often staffed with individuals that are directly or indirectly affiliated with the controlling shareholder, leaving small individual investors with no representation.¹⁷ An average listed firm in China has about ten members on its board of directors, among which only two are independent directors in 2002, the year when the percentage is the highest in our sample.

Under such circumstances, one way to protect the interests of minority shareholders is to guarantee a minimum number of independent directors on the board who are not affiliated with either the controlling shareholder or the listed firm, but rather serve on behalf of the outside investors. The recent effort to improve the quality of corporate governance in China has followed this logic and the CSRC has introduced certain standard corporate governance measures borrowed from the West.¹⁸ Notably, 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 would be required to have at least two "independent directors" on its board of directors by June 30th, 2002, and by June 30th, 2003, at least one third of the board members would be required to be "independent directors."¹⁹ 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 the chairs of these committees should also be served by independent directors.²⁰

¹⁷ See Qiang (2003) and Wu (2003) for discussions on "insider" control in Chinese listed firms.

¹⁸ 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.

¹⁹ According to the Guidelines, an individual need to meet the following conditions to be considered "independent": (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.

²⁰ Another example of the reform measures is the separation of the CEO position from the board chairmanship. Though there is no clear stipulation in the Company Law or other laws in China, many Chinese scholars and policy makers have recommended the separation as a good corporate governance practice. 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. Since the majority of board members and management are both appointed by the largest shareholders, however, the board of directors is not truly independent

Given the prevalence of “insider” control in Chinese listed firms, independent directors who are truly independent of the controlling shareholders have the potential to substantially improve the quality of corporate governance. There exist, however, conflicting views on how effective independent directors are in improving corporate governance in China. According to recent newspaper coverage, increasingly independent directors have hired independent auditors to audit the books for the listed firm, while others have refused to acquiesce to decisions made by the management and the controlling shareholders of the listed firm.²¹ On the other hand, independent directors till recently only had very limited rights in litigation, predicting low effectiveness in their presence. Both views, however, are based on anecdotal evidence, and we will provide rigorous econometric evidence on their validity. Our next hypothesis is, therefore: *Hypothesis IV: The appointment of independent directors enhances turnover-performance sensitivities.*²²

Another manifestation of the prevalence of “insider” control is the close relationship the listed firm’s top management has with its controlling shareholder company. Between 1998 and 2002, CEOs of 41% of China’s listed firms simultaneously held executive positions in the controlling shareholder companies.²³ Since appointing one of its own executives to be the listed firm’s CEO is the most direct way for the controlling shareholder to exert its control, the CEO is probably expected to serve the interests of the controlling shareholder firm more so than those of the listed firm.

It follows that for CEOs holding executive positions in the controlling shareholder firms, the criteria for measuring the CEO’s success may thus be linked more to his or her effectiveness in transferring wealth from the listed firm to the controlling shareholder rather than to his or her ability in improving performance of the listed firm per se. To the extent that such wealth transfer activities, i.e., “tunneling” activities are more prevalent in firms in which CEOs pledge

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. As expected, we find no discernable effect on turnover-performance sensitivities of the separation of the CEO position from the board chairmanship (in contrast, Goyal and Park, 2002 find evidence on the beneficial effect of the separation of the CEO position from the board chairmanship for the U.S.). These and other unreported results are available from the corresponding author at tkato@mail.colgate.edu upon request.

²¹ See, for instance, “Are Independent Directors Useful?” the *Economic Observer* (Jingji Guancha), June 26, 2004 edition and “How can Independent Directors Become Truly Independent?” the *Liberation Daily* (Jiefang Ribao), December 20, 2004 edition.

²² See for example, Weisbach (1988), Dahya, McConnell, and Travlos (2002), and Suchard, Singh, and Barr (2001) which test a similar hypothesis for listed firms in the U.S., the U.K. and Australia.

²³ See Table 1.

allegiance to the controlling shareholder and that the amount of “tunneling” is reflected negatively in the listed firm’s performance, the link of CEO turnover to firm performance is expected to be weaker for these listed firms.²⁴ Our next hypothesis is therefore a story about the Chinese version of “management entrenchment”:

*Hypothesis V: CEO turnover-performance sensitivities are weaker for listed firms with CEOs who also hold positions in the controlling shareholders.*²⁵

Finally, there may be doubt about the validity of using executive turnover as a measure for the quality of corporate governance in China. Although China’s labor market for executives is still in its early stage of development, the increased executive turnover rate since the beginning of the reform era suggests that executive turnover is an effective mechanism to infuse new blood into the firm’s management and turn a company’s poor performance around. But two facts suggest that turnover may not be as effective in disciplining executives in government controlled firms as privately controlled firms. SOEs still have the strong legacy of socialism and command economy and economic efficiency is still not the only objective. It is, therefore, difficult for SOEs to improve firm performance or to update the personnel decision mechanisms. We therefore test the following two related hypotheses to substantiate the implicit assumption we have made up to this point:

*Hypothesis VI: Firm performance will improve significantly after the replacement of the CEO.*²⁶

Hypothesis VII: Such an improvement will be greater for privately controlled firms than for state controlled firms.

Section 3: Data and Measurement

3.1 Defining CEOs and CEO turnover in Chinese Firms

Many studies on executive turnover in the U.S. and other developed countries have focused on CEOs.²⁷ In China, however, CEO is a relatively new concept and only very recently

²⁴ Several high-profile cases investigated by the CSRC since 2001 suggest that the most commonly used method of “tunneling” by controlling shareholders of Chinese listed firms is to borrow loans or secure loan guarantees from their controlled listed firms. (See various issues of *Shanghai Securities* (Shanghai Zhengquanbao).)

²⁵ Volpin (2002) develops and tests a similar hypothesis, using Italian data.

²⁶ Kaplan and Minton (1994) develop and test a similar hypothesis, using Japanese data. Other studies include Weisbach (1988), Murphy and Zimmerman (1993), Dedman and Lin (2002), Huson, Malatesta, and Parrino (2004), Neumann and Voetmann (2005)

²⁷ See for example Murphy (1999) for a review of the literature on executive turnover.

some companies have started to use the title. Since Chinese firms have historically used “General Manager (*zongjinli*)” as the title for their top executives, one is tempted to focus on these General Managers. However, a few facts complicate the matter and suggest that the designation of “General Manager” as the top executive in China may not be always correct. First, the Corporate Law in China stipulates that the Chairman of the board of directors is the legal person representative of a listed firm (Corporate Law §3, 1993). Second, the Chairman of the board of directors is appointed by the largest shareholder in the majority of listed firms in China.²⁸ Given the highly concentrated ownership structure of Chinese listed firms, the Chairman appointed by the largest shareholder tends to be powerful and is often involved in the company’s daily decision-making even without holding the position of “General Manager” simultaneously.

According to a survey of firms listed on Shanghai Stock Exchange in 2001, about 80% of listed firms have the Chairmanship held by someone different from the General Manager and among these Chairmen, more than half receive salaries from the listed firm, work for the firm full time, and are generally involved in the company’s daily decision making. Furthermore, it is commonly believed that when both the Chairman and the General Manager are responsible for a company’s daily operations, the Chairman is more powerful than the General Manager.²⁹

Therefore, we adopt the following procedures to determine the top executive of the firm, referred to as CEO hereafter. When the same individual serves as both the Chairman and the General Manager, he or she is considered the CEO of the firm. When two separate individuals hold the Chairman and the General Manager positions, we consider the Chairman as the CEO insofar as he/she is paid by the listed firm. As discussed before, generally the Chairman is involved and has a final say in day to day management decision except when he or she is not paid by the listed firm but rather paid by the largest shareholder of the listed firm.³⁰

Information on the General Manager and Chairman as well as accounting and financial data are obtained from the China Stock Market and Accounting Research Database (CSMAR)

²⁸ See for instance Wu (2003).

²⁹ See, for instance, “Chairman of the board or general manager: Who’s the CEO in a Chinese company?” *China Securities*, Jan. 31, 2002. This was also confirmed during our interviews with Chinese executives in Beijing, Shanghai, and Chengdu in the summer of 2004.

³⁰ One may argue that it is plausible that the Chairman is involved in day to day business decision and still more powerful than the General Manager even if he is not paid by the listed firm, and that including those firms with CEOs identified somewhat ambiguously contaminate the results. Reassuringly our key results do not change qualitatively even if we limit our analysis to only those firms with CEOs defined clearly with little controversy (or firms with the same individuals serving both the Chairmanship and the General Manager position and with the Chairmen on the listed firm’s payroll).

developed by Shenzhen GTA Information Technology Company, while data on ownership structure and corporate governance are assembled from the database developed by Sinofin Information Services. The CSMAR data set has been used in previous studies,³¹ 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 2002.³²

Using the CSMAR database, we first identify for each listed firm in each year whether the General Manager position and the Chairmanship are served by the same individual. For those firms with the same individual serving the General Manager position as well as the Chairmanship, we consider him/her the CEO. For the remainder, we use the CSMAR database to find out whether the Chairman is on the firm's payroll. If that is the case, we determine him/her the CEO. Otherwise we consider the General Manager (who is almost always on the firm's payroll) the CEO. In the few cases where payroll information is not available in the database, we search online sources for information on who is in charge of the company's daily operations (for instance, who is cited as the most powerful figure by the major newspapers). When everything else fails, we rely on information from the previous and the following years to determine what position corresponds to CEO in a company.

The CSMAR database provides data on the starting year of each CEO's *current* term, with a typical term for CEOs being three years in China, but fails to supply the year in which he or she is first appointed to the CEO position. To obtain data on the total CEO tenure for those who serve more than a term from the CSMAR database. To obtain the complete tenure data, we supplement the CSMAR database with the annual reports of all listed firms.

The unit of observation in our analysis is the firm-year pair. We exclude from our analysis observations with CEOs who have not served for at least a full year at the CEO position, because the data only allow for annual performance measures and there is no meaningful annual performance measure to be linked to turnover probability of such CEOs with less than one year of experience with the CEO positions.

Finally, to focus on CEO departures that are related to firm performance, we follow the standard approach used in the literature to exclude CEO departures due to death, illness or

³¹ See, for instance, Sun and Tong (2003), Bai, et. al (2003), and Bai, Liu, and Song (2003).

³² There is a companion paper in which we use the Sinofin dataset to examine executive compensation in Chinese listed firms (Kato and Long, 2004).

company control changes as missing values.³³ Since the data do not allow us to identify CEO departures due to normal retirement, following the literature we include CEO's age to control for the impact on CEO departures due to normal retirement.

After applying the above exclusion criteria to the data, we end up with 634 firms and a total of 2167 observations over the period of 1999-2002.³⁴ The summary statistics are given in Part A of Table 1. As shown in the table, in 17 % of the observations, the Chairmanship and the General Manager position are held by the same individuals; the chairmen in 45% of the observations are paid by the listed firms and thus we refer them as the CEOs of their firms; and the remaining 38% of the observations have the General Managers as their CEOs. On average, the CEOs working in Chinese listed firms look very similar to Chinese CEOs in general. CEOs in Chinese listed firms are on average 50 years old, and only 4% of them are females, very similar to findings on Chinese CEOs in general.³⁵ Their average tenure length is 2.3 years, much shorter than the average tenure of Chinese CEOs in general.³⁶ This is, however, hardly surprising, considering the short history of Chinese listed firms.³⁷ Compared to CEOs of listed firms in the U.S. and Japan, CEOs of Chinese listed firms are much younger and have shorter tenure, although the tenure for Chinese CEOs in general is similar to, if not longer than, that in the U.S. and Japan.³⁸

The average annual CEO turnover rate is 24%, substantially higher than the average CEO turnover rate reported for the U.S. and Japan (Kaplan 1994). Beginning in 2001, the CSRC requires all listed firms to disclose whether the CEO of the listed firm also holds executive

³³ See, for instance, Kaplan (1994) and Denis, Denis and Sarin (1997). One might argue that company control changes such as takeover may be caused by poor performance and thus should be considered. As in the case of prior studies, the data are not rich enough to distinguish such company control changes caused by poor firm performance from other changes.

³⁴ There are no observations for year 1998 because lagged values are not available for 1998.

³⁵ According to "Report on Chinese Entrepreneurs: Emergence and Development" (*Zhongguo qiyejia chengzhang yu fazhan baogao*), p27, by the Survey System for Chinese Entrepreneurs 2004, the average age of Chinese CEOs is 48 and the percentage of female CEOs is 4% in 2002.

³⁶ The Survey on Chinese entrepreneurs reports that in 1998 the percentages of CEOs with tenure length between 1 and 5 years, between 6 and 10 years, between 11 and 15 years, between 16 and 20 years, and more than 20 years, to be 36%, 28.3%, 26.7%, 6.4%, and 2.6%, respectively. In the same survey conducted in 2000, the entrepreneurs reported an average of 1.6 turnovers for the top executives working in their firms during the previous 10 year period.

³⁷ Data on educational attainment are unfortunately extremely limited and available only for a very small subsample of 89 observations. For the small subsample, we find that 71% of firms with CEOs having at least a bachelor's degree, a substantially higher percentage than that reported for Chinese CEOs in general (4%). The result, however, might be due to the very small sample size.

³⁸ See for instance Kato and Rockel (1992) and Kaplan (1994) and the above footnote.

positions in the controlling shareholder. For 2001 and 2002, over 41% of them simultaneously hold positions in the controlling shareholders, suggesting close relationship between the listed firm and its controlling shareholder.

3.2 Characteristics of Chinese Listed Firms

For ownership structure, we will separate the listed firms into state controlled firms and non-state controlled firms, using data on whether the “ultimate controller” of the listed firm is the state. The ownership structure data are collected by Sinofin, and with one exception, the definition of the “ultimate controller” is comparable to that used in the corporate governance literature at 10% threshold level.³⁹ The definition of the “ultimate controller” used in prior studies requires the firms in the middle layer of a control pyramid also be listed. But according to Liu, Sun, and Liu (2003), the main mechanism of indirect control for Chinese listed firms is through a pyramid scheme where the largest shareholder of the listed firm is an unlisted firm or organization controlled by the state. One major limitation of the Sinofin database is that it only provides information on the ownership type of the ultimate controller (state or others) but not the actual percentage of shares owned by the ultimate shareholder directly and indirectly.⁴⁰

Part B in Table 1 reports descriptive statistics on the type of ultimate controller and other key firm characteristics, where all the value variables are expressed in 1995-constant RMBs. As shown in the table, a typical listed firm is much smaller than a typical firm listed on NYSE, with an average market value about 1/20 of the NYSE firms. Among all the listed firms, 83% have the government as the ultimate controller, 10% have a private individual or a private firm as the ultimate controller, while only about 1% are ultimately controlled by firms with foreign investment.⁴¹ Furthermore, only less than 40% of all company shares are freely tradable on the secondary market. Finally, the largest shareholder of a typical listed firm owns over 44% of total company stock and 42% of the listed firms have a controlling shareholder owning more than

³⁹ See La Porta, Lopez-de-Silanes, and Shleifer (1999), Claessens, Djankov, and Lang (2000), and Faccio and Lang (2002).

⁴⁰ To the best of our knowledge, this is the only publicly available data on the “ultimate controller” of Chinese listed firms. Liu and Sun (2005) traced the chain of control for 1105 listed firms and calculated the shareholdings for their ultimate controllers and thus have the best data on ownership structure. However, their ownership structure information goes only till 2001 and their data are yet to be made available publicly.

⁴¹ The remaining 6% are mostly owned by collective enterprises, non-profit organizations, or employee stock holding committees.

50% of total company stocks, suggesting a highly concentrated ownership structure in Chinese listed firms.

According to the Corporate Law passed in 1993, all listed firms are required to have a board of directors, and the average size of the board of directors has remained around 10 between 1998 and 2002. But it was not until late 2001 did the CSRC issue the guidelines for the use of independent directors in listed firms, stipulating that there should be at least two independent members on each listed firm's board of directors by June 30, 2002 and that independent directors should further constitute at least one third of the total number of directors by June 20, 2003. The guidelines proved very effective, rapidly raising the percentage of listed firms with independent directors from 2.5% at the end of 2000, to 6% in late 2001, and further to 31% by the end of 2002. The median number of independent directors reached above 2 by the end of 2002. Because the introduction of independent directors is largely an exogenous event imposed by the CSRC, our estimates on how the introduction of independent directors affects the quality of corporate governance will be less subject to endogeneity bias.

To evaluate the effectiveness of ST designation, we construct two dummy variables. The ST-NEVER dummy variable takes a value of one if the firm has never received an ST-designation, zero otherwise. The ST-RECENT dummy variable takes a value of one if the firm receives the ST designation in the current year or the previous year. In other words, all firms are first divided into two groups: (i) firms that never received ST designation during the time period under consideration, between 1998 and 2002; and (ii) firms that received the ST designation at some point during the time period under consideration. For the former group of firms, The ST-NEVER dummy variable takes a value of one for all observations (or firm-year pairs), whereas for the latter the ST-RECENT dummy variable takes the value of one if the firm received ST designation within the last two years. Since 1998, ST-NEVER=0 for less than 12% of the observations in our sample, while ST-RECENT=1 for less than 5% of the observations.

Section 4: Econometric Specifications and Results

As is often done in the literature, we estimate CEO turnover-performance sensitivities by estimating a logit model. We begin with Hypothesis I using the following model:

$$(1) \ln[\Pr(\text{TURNOVER})/1-\Pr(\text{TURNOVER})]= \alpha + \beta_1\text{PERFORMANCE} + \beta_2\text{MAJORITY} \\ + \beta_{21}\text{PERFORMANCE*MAJORITY} + \gamma Z + u$$

where TURNOVER=1 if the firm replaces its CEO during the year, 0 otherwise; PERFORMANCE=firm performance in the previous year; MAJORITY=1 if the firm's direct largest shareholder owns more than 50 percent of the firm, 0 otherwise; Z is a vector of control variables; α , β_1 , β_2 , and β_{21} are the coefficients to be estimated; γ is a vector of coefficients on the control variables; and u is the disturbance term. For PERFORMANCE, as in the case of most prior studies, we use stock market performance measure (industry adjusted stock return or RETURN) as well as accounting measures (i.e., industry adjusted changes in ROA or Δ ROA).⁴²

The literature often considers firm performance from both the current period as well as the previous period.⁴³ However, since 57% of the CEO departures in our sample occur in the first six months of the year, firm performance in the current year is likely to reflect the replacing CEO's job performance as much as it does the departing CEO's. Thus we use firm performance in the previous year.⁴⁴

The control variables include a variety of dummy variables capturing the possible influence on CEO turnover of the CEO's age, gender, tenure as CEO, job title (general manager or chair/GM dual position), as well as firm size (measured by the logarithm of the firm's market value) and time effects.⁴⁵ To control for CEO's age and tenure is particularly important since we are unable to separate CEO turnover due to normal retirement from disciplinary turnover.⁴⁶

⁴² See for example Kang and Shivdasani (1995), Denis, Denis, and Sarin (1997), Murphy (1999), Campbell and Keys (2002), and Anderson and Campbell (2004).

⁴³ See for instance, Kaplan (1994)

⁴⁴ We also consider firm performance in the previous two years in the regressions, which unfortunately leads to a substantial reduction in the sample size. In spite of the smaller sample size, however, reassuringly we find no discernable differences in our key results.

⁴⁵ Specifically we created 11 dummy variables capturing the impact on CEO turnover of his/her age; and 10 dummy variables gauging the effects on CEO turnover of his/her tenure as CEO. In addition, we also include dummy variables controlling for the possible impact on CEO turnover of our definitional differences in CEOs (i.e., whether the firm's CEO is identified as an individual serving both the General Manager position and the Chairmanship of the board; as an individual serving only the Chairmanship and on the firm's payroll; or as an individual serving only the General Manager position and on the firm's payroll.) We also use the number of employees as an alternative measure for firm size with similar results.

⁴⁶ In addition, we also consider board size as an additional control and find no discernable differences.

Columns (1) and (2) of Table 2 show the maximum likelihood estimates of Equation (1). The results are not sensitive to whether firm performance is measured by industry adjusted stock return (stock market performance) or industry adjusted change in ROA (accounting performance). The estimated coefficient on PERFORMANCE has the right sign yet highly insignificant in both cases, suggesting that there is no link between CEO turnover and firm performance for listed firms whose largest shareholders own less than the majority of the company stock (or MAJORITY=0). In other words, even if the firm is listed in one of the stock exchanges in China, insofar as the firm does not have concentrated ownership structure, the fate of its CEO is not significantly tied to the firm's stock market performance or its accounting performance.

On the other hand, the estimated coefficient on PERFORMANCE*MAJORITY is negative (right sign) and statistically significant at the conventional levels (10% level for the rate of return specification and 1% level for the change in rate of return specification). This is consistent with the incentive hypothesis under weak investor protection. When the largest shareholder of the listed firm has a greater stake in the firm (as reflected in owning the majority of the stock), it will monitor the CEO more carefully and make his/her fate more tied to firm performance.⁴⁷

To examine the magnitude of the majority shareholder effect, we compare the predicted probabilities of CEO departure for the following two cases. The baseline case is the firm of which the largest shareholder does not own more than 50% of the company stock (MAJORITY=0), while the second case is the firm with a majority controlling shareholder (MAJORITY=1). For the other firm characteristics, we assign both cases the median value of size and the mode value of all the other characteristics (including the age, gender, tenure, and position type (dual, chair, or general manager) of its CEO).⁴⁸ As shown in the first two rows of Table 2 Part B, when relative rate of return is used as the performance measure, an improvement of firm performance from the 25th percentile to 75th percentile does not lead to any discernable decrease in the probability of CEO departure for the baseline case. For the majority controlling shareholder case, such an improvement will decrease the CEO turnover rate from 20% to 17%, a substantial change given that the average CEO turnover rate for the whole sample is 28%.

⁴⁷ A similar result is obtained for Italy by Volpin (2002).

⁴⁸ See Table 1 for summary statistics of firm characteristics.

Similarly, when relative change in ROA is used as the performance measure, such an improvement will also lead to a large reduction in CEO turnover rate, from 32% to 24%.

To test Hypothesis II, we augment our baseline model, Equation (1), with PRIVATE and an interaction term between PRIVATE and PERFORMANCE, where PRIVATE=1 if the firm's "ultimate controller" is a private individual or firm, 0 otherwise. That is,

$$(2) \ln[\text{Pr}(\text{TURNOVER})/1-\text{Pr}(\text{TURNOVER})]=\alpha+\beta_1\text{PERFORMANCE}+\beta_2\text{MAJORITY}+\beta_{21}\text{PERFORMANCE*MAJORITY}+\beta_3\text{PRIVATE}+\beta_{31}\text{PERFORMANCE*PRIVATE}+\gamma Z+u.$$

Column (3) in Table 2 presents the logit estimates of Equation (2) using stock rate of return as the performance measure. The effect of majority control remains significant. The estimated coefficient on PERFORMANCE*PRIVATE is negative (right sign) and statistically significant at the 5 percent level, confirming our hypothesis that there is a higher CEO turnover-performance sensitivity for listed firms with private individuals or firms as their ultimate controllers. In addition, the estimated coefficient on PRIVATE is positive and statistically significant at the 1 percent level. All things equal, CEO will enjoy less job security in listed firms with private individuals or firms as the ultimate controllers.

When the accounting measure (change in ROA) is used, the results are more mixed. While listed firms with an absolute majority shareholder continue to have stronger link between CEO turnover and firm accounting performance, we find no statistically significant impact on turnover-performance sensitivities of private control. A possible explanation is that listed firms with private individuals or firms as the ultimate controllers rely more on stock market performance than accounting performance which tends to be more subject to management manipulation, especially in China.⁴⁹

The magnitude of the effect of private control is demonstrated in Part B of Table 2 by comparing four distinct cases. The two opposite extreme cases include: (i) the firm whose largest shareholder does not own more than 50% of the company stock (MAJORITY=0) and whose ultimate controller is the state (PRIVATE=0); and (ii) the firm whose largest shareholder does own more than 50% of the company stock (MAJORITY=1) and whose ultimate controller

⁴⁹ See Guangyuan Wang, "Problems of the listed firms caused by defects in the listing system," *China Economic Times* (Zhongguo Jingji Shibao), March 13, 2002 edition.

is a private firm or individual (PRIVATE=1). And the two intermediate cases include: (iii) the firm whose largest shareholder does not own more than 50% of the company stock (MAJORITY=0) and whose ultimate controller is a private firm or individual (PRIVATE=1); and (iv) the firm whose largest shareholder does own more than 50% of the company stock (MAJORITY=1) and whose ultimate controller is the state (PRIVATE=0). Again, all other firm characteristics are assigned the same values, at their median or mode values.

As shown in Part B, as expected, the case with MAJORITY=1 and PRIVATE=1 displays the most substantial reduction in the probability of CEO turnover from 0.37 to 0.23, following an improvement in stock performance from the 25th percentile in the industry to the 75th percentile. In addition, again as expected, the opposite case with MAJORITY=0 and PRIVATE=0 shows little reduction in the CEO turnover probability, following the same stock performance improvement. The two intermediate cases reveal a sensible pattern, i.e., a much greater reduction in the CEO turnover rate for the case with MAJORITY=0 and PRIVATE=1 than for the case with MAJORITY=1 and PRIVATE=0, pointing to the importance of ownership change from the state to private (or privatization) as an indispensable ingredient of any economic reform package.⁵⁰

Next, we study the role of the CSRC in improving corporate governance in China by testing Hypotheses III and IV. The model specified in Equation (2) is further augmented with ST-NEVER, ST-RECENT, and INDEPENDENT (the proportion of independent directors) individually and jointly. That is,

$$\begin{aligned}
 (3) \ln[\Pr(\text{TURNOVER})/1-\Pr(\text{TURNOVER})] &= \alpha + \beta_1 \text{PERFORMANCE} \\
 &+ \gamma_1 \text{ST-NEVER} + \gamma_{11} \text{PERFORMANCE*ST-NEVER} \\
 &+ \gamma_2 \text{ST-RECENT} + \gamma_{21} \text{PERFORMANCE*ST-RECENT} \\
 &+ \beta_2 \text{MAJORITY} + \beta_3 \text{PRIVATE} \\
 &+ \beta_{21} \text{PERFORMANCE*MAJORITY} + \beta_{31} \text{PERFORMANCE*PRIVATE} + \gamma Z + u, \\
 (4) \ln[\Pr(\text{TURNOVER})/1-\Pr(\text{TURNOVER})] &= \alpha + \beta_1 \text{PERFORMANCE} \\
 &+ \gamma_3 \text{INDEPENDENT} + \gamma_{31} \text{PERFORMANCE*INDEPENDENT} \\
 &+ \beta_2 \text{MAJORITY} + \beta_3 \text{PRIVATE} \\
 &+ \beta_{21} \text{PERFORMANCE*MAJORITY} + \beta_{31} \text{PERFORMANCE*PRIVATE} + \gamma Z + u,
 \end{aligned}$$

⁵⁰ For the inefficacy of China's piecemeal approach to economic reform without privatization, see for example Lardy (1998).

and,

$$\begin{aligned} (5) \ln[\text{Pr}(\text{TURNOVER})/1-\text{Pr}(\text{TURNOVER})] = & \alpha + \beta_1 \text{PERFORMANCE} \\ & + \gamma_1 \text{ST-NEVER} + \gamma_{11} \text{PERFORMANCE*ST-NEVER} \\ & + \gamma_2 \text{ST-RECENT} + \gamma_{21} \text{PERFORMANCE*ST-RECENT} \\ & + \gamma_3 \text{INDEPENDENT} + \gamma_{31} \text{PERFORMANCE*INDEPENDENT} \\ & + \beta_2 \text{MAJORITY} + \beta_3 \text{PRIVATE} \\ & + \beta_{21} \text{PERFORMANCE*MAJORITY} + \beta_{31} \text{PERFORMANCE*PRIVATE} + \gamma Z + u. \end{aligned}$$

Estimation results of Equations (3)-(5) are provided in Table 3. Column (1) shows that the estimated coefficient on the interaction term involving the firm's relative stock rate of return and ST-NEVER is negative and statistically significant at the 10 percent, suggesting that firms that did not receive the ST-designation during the period between 1998 and 2002 tend to have stronger performance-turnover ties than firms with such a designation. On the other hand, firms that receive an ST-designation tend to have a closer link between rate of return and CEO turnover following the ST-designation, since the estimated coefficient on the interaction term involving the firm's relative stock rate of return and ST-RECENT is negative and significant at the 5 percent level. Using changes in ROA gives similar results (as shown in Column (2)), with the exception that the estimated coefficient on the interaction term involving ST-RECENT and changes in ROA is not significant, although of the right sign.

These results suggest that the ST-designation adopted by the CSRC has been effective in making CEOs more accountable for their shareholders. The designation seems to have been effective in sorting out those firms with weak corporate governance practices (as reflected in the non-responsiveness of executives to shareholder interests) as well as prompting improvements in corporate governance practices (as reflected in a stronger tie between the CEO's career prospect and shareholder interests), consistent with Hypothesis III.

The estimated coefficient on PERFORMANCE in Column (1) is positive and significant at the 10 percent level, suggesting that the state-controlled firm without a majority shareholder that received a ST-designation had a perverse positive relationship between its stock performance and CEO turnover, prior to its ST-designation. In fact, this result could be interpreted as an indication of the inferior corporate governance in Chinese listed firms, especially those that would receive the ST-designation. "Insider" control and the consequent

tunneling behavior of the controlling shareholders would lead to inferior performance of the listed firms. The perverse relationship between the fortune of the executives and the performance of the listed firms inflected with the “insider” control problem thus may reflect the severity of the tunneling activities. Given that tunneling is particularly rampant in ST-firms, the finding of the perverse, positive relationship between performance and turnover in these firms may be speaking to the prevalence and severity of insider control and tunneling in China.

Part B of Table 3 also demonstrates this result, where we present the predicted probabilities of CEO turnover for different cases to illustrate the magnitude of the effects above. The baseline case is the firm that did not receive the ST-designation between 1998 and 2002, implying that ST-NEVER=1 and ST-RECENT=0. The second case is the firm that would receive the ST-designation at one point during this period but had not yet been designated as an ST-firm. Therefore, both ST-NEVER and ST-RECENT are equal to 0 for this firm. The third case is the ST-designated firm subsequent to its designation, and thus ST-NEVER=0 and ST-RECENT=1. The other firm characteristics for the three firms are set at their median or mode values as before.

The second row shows that the predicted probability of CEO turnover significantly increases from 28% to 35% as an ST-firm’s relative rate of return improves, prior to its ST-designation, from the 25th percentile to 75th percentile. This highlights the perverse incentive mechanism present in the Chinese listed firms with the worst corporate governance. But subsequent to its ST-designation, the predicted CEO turnover probability for the ST-firm appears to have a more normal relationship with its firm performance. As its relative rate of return improves from the 25th percentile of the industry to the 75th percentile, the firm’s predicted CEO turnover rate decreases from 17% to 14%, a substantial drop. Since the change in ROA is subject to more manipulation, when it is used as the performance measure, the changes in predicted probability are less significant, as expected.

Columns (3)-(4) provide results on the effectiveness of another measure adopted by the CSRC to improve corporate governance in Chinese listed firms: the introduction of independent members to their board of directors. The results show that this measure has also been effective to the extent that performance-turnover relationship is a reasonable indicator for the quality of corporate governance. Specifically, the estimated coefficient on the interaction term involving PERFORMANCE and INDEPENDENT is negative and statistically significant at the 10 percent level when stock return is used and at the 5 percent level when ROA is used, supporting

Hypothesis IV that independent directors will be conducive to strengthening CEO turnover-performance link.⁵¹

Part B demonstrates the magnitude of the effects as usual. When there are no independent members on the board of directors, the change in firm performance leads to little changes in the predicted probability of CEO turnover. But when the percentage of independent directors increases to a third of the board members, the predicted turnover rate decreases considerably from 19% to 9% as its stock performance measure increases from the 25th percentile of the industry to the 75th percentile, and from 28% to 24% as its accounting performance measure increases from the 25th percentile of the industry to the 75th percentile.

To test the robustness of the above results, we include both the ST-designation and the percent of independent directors in the model. As shown in Columns (5) and (6), the results are similar to those presented above, both qualitatively and quantitatively.

As discussed in Section 2.1, “insider” control is one of the biggest challenges in China’s endeavor to improve its corporate governance, and insider-dominated boards of directors are a reflection of this phenomenon. This explains the utmost effort taken by the CSRC to increase the presence of independent directors and the effort appears to be paying off according to our estimates of Eq. (3)-Eq. (5). We now test Hypothesis V to study another aspect of “insider” control, “insider” CEOs that simultaneously hold positions in the controlling shareholder company and the listed firm. Because information for “insider” CEOs is only available since 2000, the sample size decreased substantially when studying this aspect of “insider” control. In addition, having “insider” CEO is highly correlated with the ST-designation.⁵² Therefore, we start our estimation with the most parsimonious specification. Specifically, we estimate the following model:

$$\begin{aligned}
 (6) \ln[\text{Pr}(\text{TURNOVER})/1-\text{Pr}(\text{TURNOVER})] = & \alpha + \beta_1 \text{PERFORMANCE} \\
 & + \gamma_4 \text{INSIDE CEO} + \gamma_{41} \text{PERFORMANCE} * \text{INSIDE CEO} \\
 & + \beta_2 \text{MAJORITY} + \beta_3 \text{PRIVATE} \\
 & + \beta_{21} \text{PERFORMANCE} * \text{MAJORITY} + \beta_{31} \text{PERFORMANCE} * \text{PRIVATE} + \gamma Z + u,
 \end{aligned}$$

⁵¹ Since the percentage of independent directors increased over time, one concern with the observed significant effect of independent directors is that it merely reflects the corporate governance improvement over time. To take into account of this possibility, we estimate the model including interaction terms involving INDEPENDENT and year dummies. And reassuringly, we obtain very similar results.

⁵² Specifically, the ST-firms are less likely to have “insider” CEOs.

where INSIDER CEO=1 if the CEO of the listed firm simultaneously works for the largest shareholder, 0 otherwise. We then add INDEPENDENT to the model as a robustness test as follows:

$$\begin{aligned}
 (7) \ln[\Pr(\text{TURNOVER})/1-\Pr(\text{TURNOVER})] = & \alpha + \beta_1 \text{PERFORMANCE} \\
 & + \gamma_4 \text{INSIDE CEO} + \gamma_{41} \text{PERFORMANCE} * \text{INSIDE CEO} \\
 & + \gamma_3 \text{INDEPENDENT} + \gamma_{31} \text{PERFORMANCE} * \text{INDEPENDENT} \\
 & + \beta_2 \text{PRIVATE} + \beta_3 \text{MAJORITY} \\
 & + \beta_{12} \text{PERFORMANCE} * \text{PRIVATE} + \beta_{13} \text{PERFORMANCE} * \text{MAJORITY} + Z\gamma + u
 \end{aligned}$$

The maximum likelihood estimates of Equations (6) and (7) are presented in Table 4. As Column (1) demonstrates, we find a positive and statistically significant (at the 5 percent level) coefficient on PERFORMANCE* INSIDE CEO when we consider stock performance. As such, Hypothesis V is supported insofar as stock performance is concerned. In other words, turnover-performance link is weaker when CEOs work for the largest shareholders. However, we fail to find such result when change in ROA is used to measure firm performance. Columns (3) and (4) in Table 4 further confirm that considering both INDEPENDENT and INSIDE CEO simultaneously will not change the results obtained with each variable considered separately.

Part B of Table 4 demonstrates the magnitude of the effects by comparing two cases, where the only difference between them is that the former does not have an “insider CEO” while the latter has one. A discernable change in the predicted CEO turnover rate following stock performance improvement from the 25th percentile to 75th percentile is obtained only for the case with the presence of “insider CEO”. The change, however, is a perverse one: the performance improvement increases the predicted turnover rate from 19% to 28%.

Similar to the perverse performance-turnover relationship observed in ST-firms prior to their ST-designation, this finding can be interpreted as highlighting the inferior corporate governance in Chinese listed firms, especially those firms whose CEOs simultaneously work for the controlling shareholder company and thus may be evaluated on the performance of the controllers rather than that of the listed firm. To the extent that tunneling benefits the controlling shareholder company at the expense of the listed firm, the perverse relationship between the performance of the listed firm and the turnover rate of its CEO may well reflect the prevalence and severity of “insider” control and the consequent tunneling activities.

Our last empirical task is to test the final hypothesis that firm performance will improve significantly after the replacement of the CEO and the improvement will be greater for privately controlled firms than for state controlled firms. Thus, we estimate:

$$(8) \text{ PERFORMANCE}_t = \alpha + \beta_1 \text{ TURNOVER} + \beta_{21} \text{ TURNOVER} * \text{PRIVATE} + u,$$

where PERFORMANCE_t is firm performance t years after CEO turnover and $t = -3, -2, -1, 0, +1, +2, \text{ and } +3$ (negative numbers refers to firm performance t years before CEO turnover). Tables 5 and 6 present the OLS estimates of Equation (8) with PERFORMANCE measured by industry adjusted RETURN and ΔROA . As shown in both tables, past firm performance tends to be negatively and significantly related to CEO turnover whereas subsequent firm performance is no longer negatively related to CEO performance and even positively and significantly related to CEO turnover in some instances. Especially for listed firms with private individuals or firms as the ultimate controllers, performance improvement following CEO turnover is more pronounced and significant. As such, we find evidence consistent with Hypotheses VI and VII.

Section 5: Concluding Remarks

In this paper, we have studied the link between firm performance and CEO turnover using comprehensive financial and accounting data on China's listed firms from 1998 to 2002, augmented by unique data on CEO turnover, ownership structure and board characteristics. Several patterns of the quality of corporate governance in China have emerged from our analysis. First of all, there is substantial variation in how closely Chinese listed firms link turnover of their CEOs to their firm performance. In addition, the evidence as a whole suggests that a broad program including more comprehensive investor protection is needed to improve corporate governance in China and privatization should be an integral part of the program.

Specifically, public listing alone does not lead to significant performance-turnover link, while the presence of a large controlling shareholder tends to enhance turnover-performance sensitivities and thus implying more effective corporate governance. This is in support of the "law and finance" approach to corporate governance, which attributes inferior corporate governance to weak investor protection. Furthermore, as the transitional economy literature often argues, privatization is found to enhance turnover-performance sensitivities and thus the

quality of corporate governance. Combining the above two findings implies that turnover-performance sensitivities are the greatest when a private firm or individual becomes a large controlling shareholder.

In terms of the CSRC's reform efforts to improve corporate governance in China, we have some encouraging news. Both the introduction of independent directors and the ST designation are found to boost the link between firm performance and CEO turnover and hence enhance the disciplinary functions of the stock market. These findings seem to promise a successful campaign in improving corporate governance.

But we also have some disturbing findings. In addition to the non-significant relationship between performance and turnover for state controlled firms without a majority controlling shareholder or any independent director, we also observe perverse relationship between firm performance and CEO turnover, if the firm would receive the ST-designation or if the firm's CEO simultaneously works for its controlling shareholder company.⁵³ One plausible explanation, as we have provided in Section 4, is that these firms have the most inferior corporate governance and suffer from the most severe "tunneling" activities, thus suggesting that China has a long way to go in upgrading its corporate governance.⁵⁴

⁵³ The presence of the perverse relationship also requires that private control, an absolute majority shareholder, and independent directors all be absent.

⁵⁴ An alternative explanation is that CEO turnover in these firms might have meanings completely different from the conventional one. For example, the CEO turnover might imply a promotion in the parent company. Testing such a hypothesis requires information on the careers of CEOs subsequent to their departure from the listed firms. We plan to explore this possibility in another paper.

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Table 1 Summary Statistics

Variable	Mean	s.d.	Medium	N	
<i>Part A: CEO characteristics</i>					
TURNOVER (=1 if CEO departs; 0 otherwise)	0.24	0.43	0	2167	
Dummy for General Manager	0.38	0.49	0	2167	
Dummy for Chairman/GM dual position	0.17	0.37	0	2167	
Age	49.62	7.81	50	2167	
Female dummy	0.04	0.19	0	2167	
Tenure as CEO	2.34	1.39	2	2167	
ENTRENCH (=1 if CEO also works for the controlling shareholder, 0 otherwise)	0.41	0.49	0	1039	
<i>Part B: Firm Characteristics</i>					
RETURN (industry-adjusted stock return)	0.06	0.43	-0.09	2167	
Total asset	1.78E+09	2.45E+09	1.13E+09	2167	
Total market value of company stocks	1.58E+09	1.41E+09	1.21E+09	2167	
Number of employees	2852.88	3843.24	1758	2123	
Sales	1.02E+09	1.88E+09	4.79E+08	2167	
Sales growth rate	0.16	0.44	0.11	2167	
ROA (industry-adjusted return on asset)	0.02	0.22	0.04	2167	
Δ ROA (industry-adjusted change in return on asset)	-0.02	0.22	-0.01	2167	
Proportion of firms controlled by the state ultimately	0.83	0.37	1	2167	
Proportion of firms controlled by private individuals or firms	0.10	0.31	0	2167	
Proportion of firms controlled by foreign individuals or firms	0.01	0.11	0	2167	
Percentage of tradable shares	38.77	13.14	37.16	2167	
Controlling shareholder share in percent	44.37	17.44	43.82	2167	
Absolute control (=1 if controlling shareholder shares exceeds 50%, 0 otherwise)	0.42	0.49	0	2167	
ST-NEVER (=1 if never “ST”-ed between 1998 and 2002, 0 otherwise)	0.88	0.32	1	2167	
ST-RECENT (=1 if “ST”-ed in the current or previous year, 0 otherwise)	0.05	0.21	0	2167	
Size of board of directors	9.70	2.57	9	2163	
Number of independent directors (1999-2002)	0.83	1.18	0	2165	
	1999	0.05	0.38	0	435
	2000	0.11	0.49	0	479
	2001	0.51	0.98	0	617
	2002	2.24	0.80	0	634

Sources: Data on CEOs as well as accounting and financial data are from the China Stock Market and Accounting Research Database (CSMAR) developed by Shenzhen GTA Information Technology Company. Data on ownership structure and corporate governance are from the database developed by Sinofin Information Services.

Note: The data are based on a pooled cross-sectional time series dataset of 634 listed firms over the time period of 1998-2002. All value variables are measured in RMB and adjusted for inflation using CPI (1995=100).

Table 2: Ownership structure and turnover-performance link: ownership concentration and control type (Logit estimation)

	(1) PERFORM= RETURN	(2) PERFORM= ΔROA	(3) PERFORM= RETURN	(4) PERFORM= ΔROA
<i>Part A: Parameter estimation</i>				
PERFORMANCE	-0.230 (0.99)	-1.026 (1.50)	-0.033 (0.13)	-1.446 (1.63)
MAJORITY	0.073 (0.65)	-0.023 (0.20)	0.122 (1.07)	0.022 (0.19)
PERFORMANCE *MAJORITY	-0.732 (1.89)+	-5.566 (3.13)**	-0.887 (2.24)*	-5.177 (2.79)**
PRIVATE			0.717 (3.64)**	0.542 (2.83)**
PERFORMANCE *PRIVATE			-1.368 (2.11)*	1.248 (0.91)
Observations	2167	2137	2167	2137

*Part B: Magnitude of effects
(probability of turnover at x-percentile performance)*

	25%	75%	25%	75%	25%	75%	25%	75%
MAJORITY=0	0.181	0.171	0.188	0.182				
MAJORITY=1	0.205	0.164	0.204	0.166				
PRIVATE=0& MAJORITY=0					0.162	0.161	0.176	0.168
PRIVATE=1& MAJORITY=0					0.315	0.236	0.263	0.262
PRIVATE=0& MAJORITY=1					0.194	0.157	0.197	0.160
PRIVATE=1& MAJORITY=1					0.365	0.231	0.291	0.250

Sources: Data on CEOs as well as accounting and financial data are from the China Stock Market and Accounting Research Database (CSMAR) developed by Shenzhen GTA Information Technology Company. Data on ownership structure and corporate governance are from the database developed by Sinofin Information Services.

Note: The data are based on a pooled cross-sectional time series dataset of 634 listed firms over the time period of 1998-2002. All value variables are measured in RMB and adjusted for inflation using CPI (1995=100). All models include various dummy variables capturing the possible influences on CEO turnover of the CEO's age, gender, tenure as CEO, job title (general manager, or chair/GM dual position), as well as firm size (measured by the logarithm of the firm's market value) and time effects. Absolute value of t statistics in parentheses.

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

Table 3: CSRC measures and turnover-performance sensitivities: ST designation and independent directors (Logit estimation)

	(1) PERFORM= RETURN	(2) PERFORM= ΔROA	(3) PERFORM= RETURN	(4) PERFORM= ΔROA	(5) PERFORM = RETURN	(6) PERFORM = ΔROA
<i>Part A: Parameter estimation</i>						
PERFORMANCE	1.114 (1.84)+	0.086 (0.07)	0.024 (0.09)	-0.666 (0.76)	1.313 (2.10)*	1.060 (0.73)
MAJORITY	0.170 (1.47)	0.089 (0.76)	0.116 (1.02)	0.028 (0.24)	0.175 (1.51)	0.095 (0.81)
PERFORMANCE *MAJORITY	-0.930 (2.30)*	-3.33 (1.77)+	-0.844 (2.15)*	-5.655 (3.07)**	-0.915 (2.25)*	-3.687 (1.93)+
PRIVATE	0.750 (3.78)**	0.581 (3.00)**	0.712 (3.62)**	0.562 (2.92)**	0.738 (3.65)**	0.612 (3.15)**
PERFORMANCE *PRIVATE	-1.306 (2.08)*	0.844 (0.64)	-1.335 (2.08)*	1.565 (1.09)	-1.353 (2.15)*	1.329 (0.91)
ST-NEVER	-0.941 (5.33)**	-0.989 (5.04)**			-0.892 (4.84)**	-0.997 (5.07)**
PERFORMANCE *ST_NEVER	-1.094 (1.78)+	-2.931 (1.69)+			-1.250 (1.98)*	-3.323 (1.89)+
ST-RECENT	-0.842 (2.88)**	-0.872 (2.74)**			-0.674 (2.21)*	-0.867 (2.72)**
PERFORMANCE *ST-RECENT	-2.035 (2.04)*	-0.422 (-0.28)			-2.414 (2.30)*	-0.975 (0.547)
INDEPENDENT			-0.140 (0.44)	-0.122 (0.39)	-0.117 (0.70)	-0.128 (0.41)
PERFORMANCE *INDEPENDENT			-7.704 (1.87)+	-17.520 (2.09)*	-14.092 (1.83)+	-16.548 (2.01)*
Observations	2167	2137	2167	2137	2167	2137

Part B: Magnitude of effects (probability of turnover at x-percentile performance)

	(1) PERF= RETURN		(2) PERF= ΔROA		(3) PERF= RETURN		(4) PERF= ΔROA	
	25%	75%	25%	75%	25%	75%	25%	75%
ST NEVER=1 & ST RECENT=0	0.146	0.146	0.163	0.149				
ST NEVER=0 & ST RECENT=0	0.279	0.347	0.330	0.331				
ST NEVER=0 & ST RECENT=1	0.173	0.139	0.172	0.170				
INDEPENDENT=0					0.171	0.172	0.173	0.169
INDEPENDENT=1/3					0.190	0.087	0.279	0.243

Sources: Data on CEOs as well as accounting and financial data are from the China Stock Market and Accounting Research Database (CSMAR) developed by Shenzhen GTA Information Technology Company. Data on ownership structure and corporate governance are from the database developed by Sinofin Information Services.

Note: The data are based on a pooled cross-sectional time series dataset of 634 listed firms over the time period of 1998-2002. All value variables are measured in RMB and adjusted for inflation using CPI (1995=100). All models include various dummy variables capturing the possible influences on CEO turnover of the CEO's age, gender, tenure as CEO, job title (general manager, or chair/GM dual position), as well as firm size (measured by the logarithm of the firm's market value) and time effects. Absolute value of t statistics in parentheses.

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

Table 4: Insider CEO and turnover-performance sensitivities (Logit estimation)

	(1) PERFORM= RETURN	(2) PERFORM= Δ ROA	(3) PERFORM =RETURN	(4) PERFORM = Δ ROA
PERFORMANCE	-0.403 (0.57)	-0.257 (0.23)	-0.033 (0.05)	0.607 (0.52)
INSIDER CEO	0.178 (0.89)	0.237 (1.21)	0.182 (0.90)	0.263 (1.33)
PERFORMANCE *INSIDER CEO	2.134 (2.41)*	-2.489 (1.04)	1.889 (2.12)*	-2.063 (0.87)
INDEPENDENT			-1.811 (1.63)	-2.027 (1.81)
PERFORMANCE *INDEPENDENT			-10.104 (1.53)	-27.473 (2.30)*
PRIVATE	0.876 (2.94)**	0.594 (2.11)*	0.903 (2.98)**	0.665 (2.32)*
MAJORITY	0.107 (0.53)	-0.026 (0.13)	0.082 (0.41)	-0.026 (0.13)
PERFORMANCE *PRIVATE	-1.731 (1.16)	1.817 (0.73)	-1.661 (1.12)	3.073 (1.23)
PERFORMANCE *MAJORITY	-2.762 (2.94)**	-4.607 (1.45)	-2.759 (2.92)**	-4.466 (1.38)
Observations	1011	1019	1011	1019

*Part B: Magnitude of effects**(probability of turnover at x-percentile performance)*

	25%	75%	25%	75%
INSIDER CEO=0	0.200	0.182	0.206	0.204
INSIDER CEO=1	0.191	0.279	0.258	0.238

Sources: Data on CEOs as well as accounting and financial data are from the China Stock Market and Accounting Research Database (CSMAR) developed by Shenzhen GTA Information Technology Company. Data on ownership structure and corporate governance are from the database developed by Sinofin Information Services.

Note: The data are based on a pooled cross-sectional time series dataset of 634 listed firms over the time period of 1998-2002. All value variables are measured in RMB and adjusted for inflation using CPI (1995=100). All models include various dummy variables capturing the possible influences on CEO turnover of the CEO's age, gender, tenure as CEO, job title (general manager, or chair/GM dual position), as well as firm size (measured by the logarithm of the firm's market value) and time effects. Absolute value of t statistics in parentheses.

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

Table 5: Effects on net-of-industry stock return of CEO turnover (OLS estimation)

	(1) RETURN ₋₃	(2) RETURN ₋₂	(3) RETURN ₋₁	(4) RETURN	(5) RETURN ₊₁	(6) RETURN ₊₂	(7) RETURN ₊₃
TURNOVER	-0.028 (0.27)	0.061 (1.33)	-0.067 (3.33)**	-0.010 (0.75)	0.025 (1.32)	-0.019 (1.31)	0.033 (1.30)
PRIVATE	-0.453 (1.35)	0.162 (1.34)	0.077 (1.93)	0.056 (2.93)**	0.016 (0.53)	0.017 (0.76)	0.001 (0.03)
PRIVATE* TURNOVER	1.268 (3.06)**	-0.101 (0.67)	-0.038 (0.60)	-0.053 (1.41)	0.144 (2.45)*	-0.013 (0.29)	0.201 (2.13)*
Observations	90	231	1354	2995	1570	754	274
R-squared	0.16	0.02	0.03	0.02	0.04	0.01	0.04

Sources: Data on CEOs as well as accounting and financial data are from the China Stock Market and Accounting Research Database (CSMAR) developed by Shenzhen GTA Information Technology Company. Data on ownership structure and corporate governance are from the database developed by Sinofin Information Services.

Note: The data are based on a pooled cross-sectional time series dataset of 634 listed firms over the time period of 1998-2002. All value variables are measured in RMB and adjusted for inflation using CPI (1995=100). Absolute value of t statistics in parentheses.

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

Table 6: Effects on Δ ROA of CEO turnover (OLS estimation)

	(1) Δ ROA ₋₃	(2) Δ ROA ₋₂	(3) Δ ROA ₋₁	(4) Δ ROA	(5) Δ ROA ₊₁	(6) Δ ROA ₊₂	(7) Δ ROA ₊₃
TURNOVER	-0.009 (0.76)	-0.023 (2.15)*	-0.016 (2.79)**	0.002 (0.36)	0.013 (2.39)*	0.005 (0.35)	0.022 (0.77)
PRIVATE	-0.097 (2.73)**	0.025 (0.91)	-0.001 (0.05)	0.020 (2.64)**	-0.004 (0.44)	0.038 (1.67)+	-0.042 (0.85)
PRIVATE* TURNOVER	0.115 (2.48)*	-0.024 (0.74)	-0.002 (0.13)	-0.045 (3.03)**	0.015 (0.87)	-0.034 (0.73)	0.747 (7.19)**
Observations	75	182	1302	2939	1528	733	263
R-squared	0.18	0.04	0.01	0.01	0.01	0.00	0.21

Sources: Data on CEOs as well as accounting and financial data are from the China Stock Market and Accounting Research Database (CSMAR) developed by Shenzhen GTA Information Technology Company. Data on ownership structure and corporate governance are from the database developed by Sinofin Information Services.

Note: The data are based on a pooled cross-sectional time series dataset of 634 listed firms over the time period of 1998-2002. All value variables are measured in RMB and adjusted for inflation using CPI (1995=100). Absolute value of t statistics in parentheses.

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