

The effect of cross listing on the sensitivity of managerial compensation to firm performance

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February 15, 2007

Abstract

Using a sample of mainland Chinese controlled firms listed on the stock exchanges of Hong Kong and mainland China, we assess how cross listing shares in a better investor protection country affects the managerial pay for performance sensitivity of cross listed firms. The managerial pay for performance sensitivity is defined in three ways: (a) the sensitivity of managerial annual cash compensation to firm performance, (b) the level of managerial equity ownership, and (c) the sensitivity of CEO turnover to firm performance. For non-state controlled firms, cross listed firms' pay for performance sensitivity is stronger than that of non-cross listed firms and closer to that of comparable firms in the cross listing country. However, there is little evidence that cross listing improves the managerial pay for performance sensitivity for state controlled firms.

JEL classification: J33, J63, K22, N25, N45

Key words: cross listing, executive compensation, state ownership, Hong Kong, China

We wish to thank Charles Chen, Zhonglai (Di) Dai, Yuyan Guan, Ferdi Gul, Mingyi Hung, Andy Leone, Karl Muller, Xijia Su, T.J. Wong, Zhifeng Yang, Yiwei Yao, Tianyu Zhang, Jerry Zimmerman, and workshop participants at the Chinese University of Hong Kong, City University of Hong Kong, the Hong Kong University of Science and Technology, Pennsylvania State University, Singapore Management University, University of Texas at Dallas, the 5<sup>th</sup> China Empirical Accounting Research Conference for helpful comments. Bin Ke thanks the Smeal College of Business for research support. Part of this research was completed while Bin Ke was visiting the Cheung Kong Graduate School of Business in Beijing and the City University of Hong Kong.

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## 1. Introduction

La Porta et al. (1998, 2000) show that investor protection is poor in many countries, which in turn carries significant economic consequences, such as low external finance and share prices, and underdeveloped financial markets. Starting with the influential papers by Coffee (1999) and Stulz (1999), the cross listing literature has argued that firms incorporated in countries with poor investor protection can credibly bond themselves to better investor protection by cross listing their shares in a foreign stock exchange with better investor protection (hereafter referred to as the bonding hypothesis). The reason cross listing can serve as a credible bonding mechanism is that cross listed firms will be subject to the increased scrutiny of multiple external monitors in the cross listing country. For example, Coffee (2002) argues that cross listing on a U.S. stock exchange subjects a foreign firm to the enforcement powers of the Securities and Exchange Commission (SEC), potential class action and derivative lawsuits by minority shareholders, stringent financial disclosures, and increased monitoring by reputational intermediaries (e.g., underwriters, credit rating agencies, analysts, and institutional investors). Consistent with this hypothesis, the existing literature finds that cross listing on the U.S. stock exchanges is associated with lower private benefits of control (Doidge 2004), higher firm valuation (Doidge et al. 2004), lower cost of capital (Hail and Leuz 2006), more scrutiny by financial analysts (Lang et al. 2003), and better access to external finance (Reese and Weisbach 2002).<sup>1</sup>

However, the existing cross listing bonding literature is subject to several important limitations. First, there is little research on the effect of cross listing on a cross listed firm's internal governance structure, such as managerial compensation, board

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<sup>1</sup> See Karolyi (2006) and Benos and Weisbach (2004) for a comprehensive survey of this literature.

structure, etc. This is an important omission in the literature because improvement in internal governance structure (if exists) could be a competing explanation for the positive benefit of cross listing. In addition, many external and internal corporate governance mechanisms are complementary to each other (see, e.g., Shleifer and Vishny 1986; Cremers and Nair 2005) and thus the effectiveness of the external monitoring mechanisms articulated in the bonding hypothesis (e.g., monitoring by sophisticated investors) may also depend on the extent of changes in a cross listed firm's internal governance.

Second, the existing literature does not offer a clear sense on the closeness that cross listing can bring a foreign firm's level of investor protection to that of a comparable domestic firm in the cross listing country. This issue is important because to the extent that cross listing can elevate a foreign firm's investor protection to the same level as that of a comparable domestic firm, the divergence in investor protection around the world documented in La Porta et al. (1998) should not be a big concern because firms in poor investor protection countries can always opt to list their shares in a country with better investor protection.

Third, as Leuz (2006) and Licht (2003) indicate, the existing literature has not paid enough attention to the potential influence of home country institutional factors (e.g., ownership concentration) on cross listed firms' behavior. This is surprising because a cross listed firm is subject to the relevant laws and regulations of both its home country and cross listing country. The evidence in Leuz (2006) and Lang et al. (2006) suggest that in the case of earnings management, home country institutional factors still exert a significant effect on the quality of cross listed firms' financial reporting.

Finally, most cross listing bonding studies focus on foreign firms cross listed in the U.S. only. Because several other countries (e.g., United Kingdom and Hong Kong), which boast similar levels of investor protection as (if not better than) the U.S., also receive an increasing number of cross listings (Etter 2006), it is interesting to examine whether the bonding hypothesis that is developed in the U.S. setting will apply to those countries as well.<sup>2</sup>

The objective of this study is to examine how cross listing a firm's shares in a foreign country with better investor protection affects the sensitivity of managerial compensation to firm performance, an important internal corporate governance mechanism that has been neglected in the cross listing literature. We measure the managerial pay for performance sensitivity in three ways used in prior research (see, e.g., Murphy 1999): a) the sensitivity of managerial annual cash compensation to firm performance; b) the level of managerial equity ownership (stock and stock options); and c) the sensitivity of CEO turnover to firm performance. We use all three measures because they capture different aspects of the pay for performance sensitivity.

We test our research question using a unique set of firms from one single country, China. We select China for several reasons. First, the China sample allows us to overcome many of the above mentioned limitations in the existing bonding literature. Specifically, our China sample contains three types of publicly traded firms: A share, H share, and Red Chip share. All three types of firms are controlled by mainland Chinese shareholders and operate their business in mainland China, but differ in terms of incorporation and listing locations. A shares refer to firms that are incorporated in

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<sup>2</sup> LeL and Miller (2006) find no evidence that the sensitivity of CEO turnover to firm performance is stronger for foreign firms cross listed on the London Stock Exchange than for non-cross listed foreign firms.

mainland China and trade on one of the two Chinese domestic stock exchanges. H shares refer to firms that are incorporated in mainland China but trade on the Hong Kong Stock Exchange. Red Chip shares refer to mainland Chinese controlled firms that are incorporated outside China (Hong Kong, Bermuda, or the Cayman Islands) and trade on the Hong Kong Stock Exchange.<sup>3</sup> As investor protection is better in Hong Kong than in mainland China (see e.g., Allen et al. 2005), A shares represent firms from a poor investor protection country, Red Chip shares represent firms from a good investor protection country (i.e., a comparable firm in the cross listing country), while H shares represent firms from a poor investor protection country that cross list in a good investor protection country. The availability of the three different types of firms within a single country allows us to test the benefits and limits of cross listing as a bonding mechanism while minimizing other extraneous differences, which are often difficult to control for in a cross country study.<sup>4</sup> In this study we examine whether the sensitivity of managerial compensation to firm performance (as defined above) increases from A shares to H shares, as predicted by the bonding hypothesis. In addition, we examine whether the sensitivity of managerial compensation to firm performance is comparable for H shares and Red Chip shares.<sup>5</sup>

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<sup>3</sup> We do not differentiate Red Chip stocks incorporated in Hong Kong from Red Chip stocks incorporated in Bermuda and the Cayman Islands because all three countries follow the common law legal system. In addition, Red Chip stocks incorporated in Bermuda and the Cayman Islands are subject to additional listing requirements promulgated by the HK Stock Exchange (see Chapter 19 of the Listing Rules). Therefore, the level of investor protection should be similar for the three types of Red Chip stocks.

<sup>4</sup> For example, managerial labor markets typically differ across countries and thus create a problem when comparing managerial pay across countries. However, executive managers in A, H, and Red Chip shares are typically Chinese nationals from mainland China and thus should face the same labor market.

<sup>5</sup> A significant number of mainland Chinese controlled firms are also listed on the Stock Exchange of Singapore, a country with good investor protection. Unfortunately, detailed managerial compensation data are unavailable for those firms.

Another reason for selecting China is the importance of China in itself and the common difficulty that many existing theories have in explaining Chinese economic phenomena (see, e.g., Allen et al. 2005). In recent years more and more Chinese companies (especially state controlled companies) raise large sums of equity capital from overseas financial markets (see, e.g., Linebaugh 2006), yet there is little understanding of the behavior of those companies. It is far from clear whether the bonding hypothesis will apply to the Chinese firms cross listed in many developed financial markets (such as Hong Kong, Singapore, United Kingdom, and U.S.). This is because many listed Chinese firms are controlled directly or indirectly by the state. As a result, one cannot presume that the cross listing of a state controlled firm will bring the same level of enhancement in investor protection as the cross listing of a non-state controlled firm. In this study we analyze how state control affects the sensitivity of managerial compensation to firm performance across A shares, H shares, and Red Chip shares.

For non-state controlled firms, we find that the managerial pay for performance sensitivity (defined using the three pay for performance sensitivity measures) is generally stronger for H shares than for A shares, consistent with the bonding hypothesis. In addition, there is some evidence that cross listing moves H shares' pay for performance sensitivity closer to that of Red Chip shares (i.e., comparable firms in the cross listing country).

For state controlled firms, we find little evidence that the managerial pay for performance sensitivity is stronger for H shares than for A shares. This evidence is inconsistent with the bonding hypothesis and stands in direct contrast to the results for non-state controlled firms, suggesting that state control negates the positive effect of

cross listing on the pay for performance sensitivity. In addition, we find that Red Chip shares' managerial pay for performance sensitivity is significantly positive and larger than that of H shares. This result suggests that cross listing fails to elevate state controlled H shares' pay for performance sensitivity to a similar level to that of comparable firms in the cross listing country. In addition, the Red Chip shares' results suggest that the influence of the state is significantly reduced in the management of Red Chip shares.

Cross listing is an endogenous decision. Doidge et al. (2005) find that firms whose insiders enjoy more control rights relative to their cash flow rights are less likely to cross list in a strong investor protection country. Their evidence suggests that H shares' pay for performance sensitivity should be stronger than that of A shares even in the absence of cross listing. This self selection bias could partially explain the results for non-state controlled firms, but it cannot explain the results for state controlled firms.

The rest of the paper is organized as follows. Section 2 discusses the differences in investor protection across the three types of firms. Section 3 develops our research hypotheses. Section 4 describes the sample selection procedures and data sources. Section 5 presents the regression models of managerial annual cash compensation, managerial equity ownership, and CEO turnover. Section 6 provides descriptive statistics on our sample firms and section 7 reports the regression results. Section 8 concludes.

## 2. Investor protection across A shares, H shares, and Red Chip shares

The domestic Chinese stock markets started in 1991 when the Shanghai and Shenzhen Stock exchanges were established by the Chinese government. Today more than 1,300 publicly traded companies (referred to as A shares) are listed on the two

domestic exchanges. In terms of total market capitalization, China (the two exchanges combined) would rank the eleventh among the largest stock exchanges in the world at the end of 2002 (Allen et al. 2005). In addition, 60% of the publicly traded firms listed the state as their largest shareholder at the end of 2002 (Allen et al. 2005).

Despite the rapid growth in the number of stock listings on the domestic stock exchanges, it is well recognized that A shares' investor protection is one of the worst around the world. For example, Allen et al. (2005) compare the overall investor protection (defined as the sum of overall creditor rights, shareholder rights, rule of law, and government corruption) in mainland China relative to the countries included in La Porta et al. (1998). They find (see their figure 1) that China, along with Mexico and Indonesia, ranks the lowest in overall investor protection. Consistent with low investor protection, prior academic research finds that A shares often have ineffective boards of directors (Fan et al. 2006), dependent external auditors (Defond et al. 2000; Wang et al. 2005), low quality financial reporting (Bao and Chow 1999), and significant expropriation of minority shareholders by majority shareholders and corporate managers (Jian and Wong 2004; Jiang et al. 2005).

In contrast, Hong Kong is one of the best financial markets in terms of investor protection. Allen et al. (2005, figure 1) rank HK one of the best in overall investor protection along with UK, US, Singapore, Japan, Germany, South Africa, and Malaysia. In addition to the strong laws and law enforcement institutions, HK registered public firms are also subject to the high quality International Financial Reporting Standards, stringent external auditors, and the constant monitoring of the free media and financial intermediaries (e.g., underwriters, analysts, and institutional investors). Consistent with

La Porta et al.'s (1997, 1998) theory that countries with strong investor protection are associated with larger and broader external financial markets, Allen et al. (2005) find that HK ranks at the top while mainland China at the bottom in terms of the size and breadth of external financial markets.

Incorporated in mainland China, H shares are subject to mainland China's Company Law and the relevant regulations issued by the China Securities and Regulatory Commission (CSRC), the counterpart of the Securities and Exchange Commission in the U.S. In order to list their shares on the HK Stock Exchange, H shares also have to subject themselves to additional rules imposed by the HK Stock Exchange.<sup>6</sup> These additional rules compensate for the significant differences between the mainland China Company Law and the HK company law (called Companies Ordinances) and aim to increase the protection of H shareholders to a level comparable to that of HK registered companies. The Appendix provides a summary of those key differences and the remedies that H share firms must incorporate in their articles of association to eliminate or reduce the differences. Essentially, those additional rules impose significant restrictions on the behavior of the firm's controlling shareholders, managers and directors, offer minority shareholders recourse to correct misconduct by the firm's officers and directors, and increase the quality of the firm's financial reporting.

In summary, we can conclude from the above discussion that investor protection is the weakest for A shares and strongest for Red Chip shares. Investor protection for H shares should be better than that of A shares because H shares are subject to the improved investor protection rules required by the HK Stock Exchange. However, it is unclear how

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<sup>6</sup> HK returned to China in sovereignty on July 1, 1997 after 100 years of British rule. In accordance with the "One Country, Two Systems" Principle agreed between the UK and China, Hong Kong's previous capitalist system and its way of life would remain unchanged for a period of 50 years.

close H shares' investor protection is to Red Chip shares' because H shares are incorporated in mainland China and thus they are more likely than Red Chip shares to be influenced by mainland China's institutional forces.<sup>7</sup>

### 3. Research hypotheses

#### 3.1. The influence of investor protection on the pay for performance sensitivity

The objective of this study is to examine how the managerial pay for performance sensitivity changes as the degree of investor protection improves from A shares to H shares and Red Chip shares while holding other determinants of the pay for performance sensitivity constant (see section 5 for a description of those control variables). As indicated in the introduction, we measure the pay for performance sensitivity in three ways: a) the sensitivity of managerial annual cash compensation to firm performance; b) the level of managerial equity ownership (stock and stock options); and c) the sensitivity of CEO turnover to firm performance. Throughout the paper, we will use the generic term "managerial pay for performance sensitivity" for all three measures unless we refer to a specific measure of the pay for performance sensitivity.

We argue that Red Chip shares' managerial pay should be positively associated with observed firm performance. This is because in a country with strong investor protection, corporate insiders' (i.e., management and controlling shareholders) ability to expropriate minority shareholders is significantly constrained and thus shareholder value

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<sup>7</sup> Due to the influence of mainland China's institutional factors, Brockman and Chung (2003) argue that the level of investor protection is still lower for H shares and Red Chip shares than for Hong Kong incorporated blue chip shares. Consistent with this argument, they find that Hong Kong incorporated blue chip shares exhibit lower bid-ask spreads and thicker depths than H shares and Red Chip shares. Gul and Fung (2004) also find more opportunistic earnings management in H shares than in Hong Kong registered companies, which include Red Chip shares and blue chip shares. Neither study compared the differences in investor protection between H shares and Red Chip shares.

maximization is likely to be the firm's primary objective. It is well established in the existing compensation literature that linking managerial pay to firm performance is an optimal solution to shareholder value maximization in the presence of information asymmetry and hidden managerial actions (see Murphy 1999 for a discussion of this literature).

We expect the managerial pay for performance sensitivity in A shares to be weaker relative to that of Red Chip shares. Because investor protection is weaker in mainland China, A shares' corporate insiders (i.e., management and controlling shareholders) should find it more optimal to expropriate minority shareholders than to maximize shareholder value.<sup>8</sup> Linking managerial pay to firm performance would align the incentives of management and minority shareholders but would reduce the management's willingness to cooperate with the controlling shareholders to extract private benefits of control from minority shareholders. In addition, a direct consequence of insiders' expropriation of minority shareholders is that the firm's accounting and stock performance measures become less informative as measures of the management's true performance (see Leuz et al. 2003 and Lang et al. 2006). Therefore, the controlling shareholders should be less likely to tie managerial pay to firm performance for A shares relative to Red Chip shares. Consistent with this prediction, Defond and Hung (2004) find that the negative relation between CEO turnover and firm performance is weaker for firms incorporated in poor investor protection countries.

As investor protection is expected to be stronger for H shares relative to A shares, we expect the pay for performance sensitivity to be stronger for H shares relative to A

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<sup>8</sup> Prior research (Jian and Wong 2005; Peng et al. 2006) finds that such expropriation is prevalent in both state controlled A shares and non-state controlled A shares.

shares, *ceteris paribus*. However, we do not make a prediction on the pay for performance sensitivity for H shares relative to Red Chip shares because it is unclear whether the degree of investor protection is the same for H shares and Red Chip shares.

### 3.2. The influence of state ownership on the pay for performance sensitivity

The above discussion does not take into consideration the influence of many home country institutional factors. In China there are several institutional forces that could moderate the expected stronger pay for performance sensitivity for H and Red Chip shares. First, pay inequality between senior executives and lower level employees is often viewed negatively in China. This is especially true in state controlled firms where the effective monitoring of state owned assets is weak. Because a strong pay for performance sensitivity would inevitably lead to a wider variation in managerial cash compensation and equity ownership, critics could opportunistically use the high managerial cash compensation and equity ownership in good years as evidence of managerial entrenchment and expropriation of state owned assets. Such serious allegations could lead to resentment among ordinary Chinese people and even social unrest (see Yam 2006 for supporting evidence). Therefore, state controlled H and Red Chip firms may be forced to choose a weaker pay for performance sensitivity, at least with regard to annual cash compensation and managerial equity ownership.

Second, as a controlling shareholder in state controlled firms, the state often has multiple and conflicting objectives. On the one hand, the state wishes its controlled firms to become as competitive and efficient as privately owned enterprises. This inevitably involves the closing of money losing operations and the layoff of excessive employees.

On the other hand, the state has an invested interest in maintaining the level of employment in state controlled firms because laying off the excessive workers in state controlled firms would create a huge burden on the state in the short run and thus may not be politically and economically feasible, even though such layoffs may create net positive social benefits over the long run. As a result, we may not observe an increased managerial pay for performance sensitivity for state controlled H shares and Red Chip shares.

Third, although the Communist Party of China (CPC) has minimal influence on non-state controlled firms, it still holds significant influence over the management of state controlled firms, especially with regard to the appointment and termination of executive managers and board directors. In theory it is the State-owned Assets Supervision and Administration Commission (SASAC) who represents and exercises the ownership rights of state owned assets on behalf of all the Chinese people. However, in reality the CPC has direct influence over the management of state controlled firms through its powerful party committees instituted in all state controlled firms. McNally (2002) finds that the party committees at both the firm and higher levels (e.g., provincial) along with the CPC's Organization Department often make the final decisions on key personnel decisions in state controlled firms. The SASAC rubber stamps the appointments only after the decision making process is complete. Using survey data from the Shanghai Stock Exchange, Wong et al. (2004) find that local party committees within listed firms exert the greatest influence over personnel decisions and the least influence over financial decisions. Because of the party's influence, it is not surprising that party members are favored over non-party members in filling in the key management positions

within state controlled firms. For example, it is almost a uniform rule that the chairman of the board be the party secretary in state controlled firms.

The direct intervention of the CPC leads to several severe consequences. First, the CPC's political interests often trump shareholders' interests. Second, the board of directors is ineffective as a monitor of executive managers because it is robbed of the right to discipline non-performing managers. Third, managers of state controlled firms find it more rewarding to nurture good relations with superiors in the party hierarchy than to seek innovative solutions to their firms' business problems. As a result, the sensitivity of managerial turnover to firm performance may not be stronger in state controlled H shares and Red Chip shares than in state controlled A shares.

There is anecdotal evidence that suggests the intervention of the CPC in the appointments of senior executives in state controlled firms at the expense of minority shareholder interests. For example, on November 5, 2004, the Chinese government suddenly swapped top executives at China's three top telecommunications companies, China Mobile (Red Chip), China Unicom (Red Chip) and China Telecom (H share). Likewise, the retirement of the chairman of CITIC (unlisted), one of China's largest state owned conglomerates, triggered top level management reshuffles at two major mainland banks in July 2006, China Construction Bank (H share) and Bank of Communications (H share). A recent Wall Street Journal article (see Dean 2006) on China Netcom Group Corp., a Red Chip firm listed on both HK and New York Stock Exchanges, provides an interesting account of the role of the CPC in state controlled firms, broadly consistent with our general description above.

The above mentioned negative influences of state control apply to both H shares and Red Chip shares. However, because Red Chip shares are incorporated and listed outside mainland China, the state's influence over firm decisions could be more limited in Red Chip shares than in H shares. We empirically test the validity of this conjecture in the context of managerial pay for performance sensitivity.

In summary, the above discussion suggests that for state controlled H and Red Chip firms, the positive effect of a HK stock listing on the pay for performance sensitivity could be moderated by the negative influence of state ownership. Therefore, we analyze the pay for performance sensitivity across A shares, H shares, and Red Chip shares separately for state controlled firms and non-state controlled firms. We define state controlled firms as those whose largest shareholder is the state directly or indirectly.

#### 4. Sample selection procedures and data sources

Although A shares, H shares and Red Chip shares are all mainland Chinese controlled firms, some firms (especially Red Chips) derive a significant portion of their revenues from outside mainland China. To avoid potential confounding effects, we limit our sample to firms that earn the majority of their revenues from mainland China (defined as more than 50%). Because many of our regression variables have to be hand collected, we limit all our empirical analyses except for the CEO turnover analysis to calendar year 2003. To avoid potential IPO-related confounding effects, we also require at least a one year gap between the IPO year and 2003 (that is, the IPO date should be no later than calendar year 2001). Both A share listings and H share listings started after 1990 while the earliest Red Chip listing occurred in 1974. To avoid potential confounding effects, we

require all our sample firms' IPO dates to be no earlier than 1991. Using the above sample restrictions, the number of usable H shares and Red Chip shares turned out to be much smaller than we expected due to missing data on key regression variables. To increase power, we added 34 H shares and 3 Red Chip shares that went public in calendar years 2002-2003. For those later additions, we employ the 2004 data for the 2002 IPOs and the 2005 data for the 2003 IPOs.

Firm size is much smaller on average for state controlled A shares than for state controlled H shares or state controlled Red Chip shares. To ensure the comparability of the three types of state controlled firms in terms of firm size, we retain only the top 15% of the state controlled A shares based on total assets. We also delete non-state controlled firms (A shares only) converted from state-owned enterprises (SOEs) to avoid potential complications. Finally, we require nonmissing total assets, book value of common equity, and stock prices. These sample selection restrictions result in 120 A shares, 60 H shares, and 35 Red Chip shares for state controlled firms, and 138 A shares, 27 H shares, and 10 Red Chip shares for non-state controlled firms.<sup>9</sup> Because the sample sizes for non-state controlled H shares and Red Chip firms are small, the reader should interpret with caution the following results for non-state controlled Red Chip firms, especially the results for the annual cash compensation regression, which requires a large number of control variables.

We limit the CEO turnover analysis to the firms included in the final sample above. In addition, we limit the turnover analysis to the period 1999-2004 because CEO

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<sup>9</sup> 24 out of the 60 state controlled H shares and 3 out of the 27 non-state controlled H shares also have their shares listed in one of the two domestic stock exchanges. In addition, 7 out of the 60 state controlled H shares and 2 out of the 35 state controlled Red Chip shares also have their shares traded on the NYSE in the U.S. None of our regression results are affected by the exclusion of either the firms that have both A and H shares or the firms that also trade on the NYSE.

turnover data have to be hand collected for all H and Red Chip shares while CEO turnover data are electronically available for all A shares only after 1998. Because chairman of the board is the top executive position in all three types of Chinese firms (higher than the position of the CEO), the CEO in this paper refers to the chairman of the board.

Our empirical analyses require data on a firm's IPO date, ownership structure, board of directors, board of supervisors, top executives' annual cash compensation and equity ownership, and accounting and stock return data. For the A share firms, we obtain all the required data from CSMAR, a leading provider of Chinese company financial data. For the H share and Red Chip share firms, we hand collect all the data items except that the accounting and stock return data are retrieved from the Worldscope database.

## 5. Research design

This section introduces the regression models and the regression variables used to test the effect of cross listing on the managerial pay for performance sensitivity. The dependent variables are top executives' annual cash compensation, top executives' equity ownership (stock and stock options), and CEO turnover. We describe the regression model for each dependent variable as follows.

### 5.1. Annual cash compensation regression

We adopt a regression of managerial annual cash compensation similar to Ke et al. (1999):

$$\ln CASHPAY = \beta_0 + \beta_1 PERF + \beta_2 H + \beta_3 REDCHIP + \beta_4 PERF \times H + \beta_5 PERF \times REDCHIP + \beta_6 CONTROL1 + \beta_7 PERF \times CONTROL1 + \beta_8 CONTROL2 + \varepsilon; \quad (1)$$

The regression model is estimated separately for state controlled firms and non-state controlled firms. The dependent variable  $\ln\text{CASHPAY}$  is the natural logarithm of the average annual cash compensation for the top executives. During our sample period, executives' annual cash compensation was not required to be disclosed individually in either mainland China or Hong Kong. A share firms were required to disclose the total cash pay for the three highest paid executives and directors. H shares and Red Chip shares were required to disclose the total cash pay for the five highest paid executives and directors. However, H shares and Red Chip shares were not required to include a director's pay in the top five total if that director's pay is included in the separate compensation disclosure for the board of directors. As a result,  $\ln\text{CASHPAY}$  may not include all of the top five executives and directors for H and Red Chip shares.<sup>10</sup> Results are robust to controlling for the number of executives included in  $\ln\text{CASHPAY}$ .<sup>11</sup>

PERF refers to firm performance. We use two measures of firm performance. The first measure is ROA, defined as the ratio of annual operating income to the average total assets. We use operating income rather than net income because A shares follow domestic accounting standards while H shares and Red Chip shares follow international financial reporting standards and operating income is less likely to be affected by the differences in accounting standards.<sup>12</sup> The second measure is RET, defined as raw stock return minus market return for the fiscal year. Market return is the Hang Seng index return for H and Red Chip shares and the Shanghai and Shenzhen composite index return

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<sup>10</sup> Chinese firm executives often enjoy significant perk consumption (Lin 2001; Cai et al. 2005). Most of those perks are associated with an executive's job title and are not sensitive to firm performance. We do not include perks in CASHPAY because data on perks are not readily available.

<sup>11</sup> Because we do not have data on each executive's annual cash pay, we could not estimate the sensitivity of changes in each executive's annual cash pay to changes in firm performance commonly used in prior research.

<sup>12</sup> We also used lagged ROA instead of ROA and obtained similar inference.

for A shares. Results are similar if we use raw returns instead for all the regressions in the paper. We use both accounting and return performance measures because the three types of listed firms could place different weights on the two measures.

H is a dummy that is 1 for H shares. REDCHIP is a dummy for red chip shares. CONTROL1 and CONTROL2 refer to a list of control variables. The variables included in CONTROL1 are UTILITIES, CONGLOMERATE, lnASSETS, and BM. UTILITIES is a dummy for firms in the utilities industry. CONGLOMERATE is a dummy for conglomerate firms. lnASSETS is the natural logarithm of total assets. BM is the ratio of book value of common equity to total market cap at the beginning of the fiscal year. The control variables included in CONTROL2 are lnCOSTOFLIVING and lnFIRMAGE. lnCOSTOFLIVING is the natural logarithm of the annual living costs in the firm's headquarters. lnFIRMAGE is the natural logarithm of the number of years since IPO.

We allow the coefficient on PERF to vary with H, REDCHIP, and CONTROL1. PERF×H and PERF×REDCHIP are our key test variables. The coefficient on PERF×H is predicted to be positive if the bonding hypothesis holds. The difference in coefficients between PERF×H and PERF×REDCHIP indicates the closeness of H shares relative to Red Chip shares in the sensitivity of cash pay to performance.

We allow the coefficient on PERF to vary with BM and UTILITIES because Smith and Watts (1992) find that the pay for performance sensitivity is weaker for value firms and regulated firms. We allow the coefficient on PERF to vary with CONGLOMERATE and lnASSETS to further control for the potential impact of business operation complexity on the pay for performance sensitivity.

## 5.2. Equity ownership regression

We employ the following regression model of managerial equity ownership similar to Core and Guay (1999):

$$EQUITYOWN = \beta_0 + \beta_1 H + \beta_2 REDCHIP + \beta_3 CONTROL + \varepsilon; \quad (2)$$

The regression model is estimated separately for state controlled firms and non-state controlled firms. EQUITYOWN refers to either the CEO's ownership of stock and stock options as a fraction of total common shares outstanding (denoted CEO\_EQUITYOWN) or the average ownership of stock and stock options by the top executives other than the chairman and the CEO as a fraction of total common shares outstanding (denoted NONCEO\_EQUITYOWN). Because chairman of the board is the top executive position in all three types of Chinese firms (higher than the position of the CEO), CEO\_EQUITYOWN refers to the equity ownership of the board chairman in this study.

Comparing CEO\_EQUITYOWN across the three firm types may not be very meaningful for non-state controlled firms because some of the non-state controlled firms are family controlled firms, which tend to have a founder who owns a significant percentage of the firm and acts as the board chairman. As a result, we also use NONCEO\_EQUITYOWN as a proxy for the top executives' equity ownership. Because NONCEO\_EQUITYOWN excludes the equity ownership of the chairman and the CEO, it is less likely to be affected by the founder's stock ownership.

Our test variables are H and REDCHIP. The bonding hypothesis would predict a positive coefficient on H. The difference in coefficients on H and REDCHIP indicates the closeness of H shares relative to Red Chip shares in managerial equity ownership.

CONTROL includes IDIOSYNCRATICRISK, BM, UTILITIES, CONGLOMERATE, lnASSETS, and lnFIRMAGE. IDIOSYNCRATICRISK is the natural logarithm of the standard deviation of the residuals from a 36-month market model regression as of the beginning of the observation year. For firms that do not have 36 months of returns, we require a minimum of 12 months of returns. The other control variables are defined above. We use IDIOSYNCRATICRISK to proxy for the noise in a firm's business environment. Demsetz and Lehn (1985) argue that firms that operate in noisier environments incur higher monitoring costs and thus should be more likely to offer equity based incentives. Smith and Watts (1992) and Gaver and Gaver (1993) also argue that firms with more growth opportunities should use more equity based incentives because it is more difficult for shareholders and directors to assess the appropriateness of managers' actions in those firms. We use BM as a proxy for growth opportunities. We also include UTILITIES and CONGLOMERATE to control for industry effects. We use lnFIRMAGE to control for the effect of firm age on the use of equity incentives. Finally, we use lnASSETS to control for size effects.

### 5.3. CEO turnover regression

We use the following Cox (1972) proportional hazard regression to study the determinants of CEO turnover for state controlled firms and non-state controlled firms separately:

$$h(t | x(t)) = h_0(t)e^{[x(t)'\beta]} \quad (3)$$

As explained in section 5.2 above, CEO turnover refers to board chairman turnover in this study. The dependent variable  $h(t|x(t))$  is the hazard rate of CEO turnover.

In discrete time, the hazard rate  $h(t)$  measures the probability that a firm will experience a CEO turnover at time  $t$  given that the firm has not experienced a CEO turnover up to time  $t-1$ . A higher hazard rate  $h(t)$  corresponds to a lower CEO tenure. In the model  $x(t)$  is a vector of time-varying explanatory variables discussed below,  $\beta$  is a vector of unknown parameters to be estimated and  $h_0(t)$  is called the baseline hazard rate independent of  $x(t)$  and is left unspecified for the Cox hazard model. The regression coefficient  $\beta$  can be interpreted in the same way as an ordinary least square regression coefficient. For example, a positive coefficient  $\beta$  implies that the hazard rate  $h(t)$  increases by  $(e^\beta - 1)$  for a one unit increase in an explanatory variable, holding everything else constant.<sup>13</sup>

In this study  $x(t)$  includes PERF ( $\Delta$ ROA or RET or both), H, REDCHIP, the interactions between PERF and H and REDCHIP, and a set of control variables, including  $\ln$ ASSETS, UTILITIES, CONGLOMERATE, and year fixed effects.  $\Delta$ ROA is defined as the annual change in total operating income scaled by the average total assets at the beginning and end of the year. Following the managerial turnover literature (see, e.g., Defond and Hung 2004), we use  $\Delta$ ROA instead of ROA as a measure of accounting performance. In addition, PERF is lagged one year relative to the CEO turnover year.

Our variables of interest are PERF $\times$ H and PERF $\times$ REDCHIP. The bonding hypothesis would predict a negative coefficient on PERF $\times$ H. In addition, the difference in coefficients between PERF $\times$ H and PERF $\times$ REDCHIP indicates the closeness of H shares relative to Red Chip shares in the sensitivity of CEO turnover to firm performance.

## 6. Descriptive Statistics

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<sup>13</sup> See Beatty et al. (2002) for a more detailed introduction to hazard regressions.

Table 1 reports the descriptive statistics across A shares, H shares, and Red Chip shares for non-state controlled firms and state-controlled firms separately. The values of all the relevant variables are denominated in the Chinese dollar RMB. Recall state controlled firms are defined as those whose largest shareholder is the state directly or indirectly.

#### 6.1. Non-state controlled firms

Not surprisingly, the largest shareholder of non-state controlled firms has a substantial stake in the listed firm (PARETN\_OWN). For all three types of firms, the median stock ownership by the largest shareholder is approximately 30% or higher. For the firms whose largest shareholder owns less than 50%, the second largest shareholder is also a private individual or entity in 86% of the firms and thus should share similar objectives as the largest shareholder; in addition, the second largest shareholder's median stock ownership is only 49.9% of the largest shareholder's stock ownership (results not tabulated). These results suggest that the largest shareholder of non-state controlled firms should have a substantial control over the management of the non-state controlled firms.

The top executives' average annual cash compensation (CASHPAY) increases monotonically from A shares to Red Chip shares. The median CASHPAY for H shares is twice as much as that for A shares, but the median CASHPAY for Red Chip shares is almost four times as much as that for H shares. Part of the difference can be explained by the difference in the cost of living (COSTOFLIVING). For example, Red Chip shares are headquartered in HK and HK's cost of living is much higher than that in mainland

Chinese cities.<sup>14</sup> Note firm size cannot be a reason for the difference in CASHPAY because A shares' median ASSETS is the largest of the three firm types.

The median equity ownership by the chairman of the board (CEO\_EQUITYOWN) differs significantly across the three firm types. The median CEO\_EQUITYOWN is almost zero for A shares, followed by 0.8% for Red Chip shares and 24.6% for H shares. Using NONCEO\_EQUITYOWN as a proxy for managerial equity incentives, we find that A shares have little managerial equity ownership while H shares and Red Chip shares have positive and comparable equity ownership. The CEO\_EQUITYOWN and NONCEO\_EQUITYOWN results for A shares vs. H shares are consistent with the bonding hypothesis. In addition, the CEO\_EQUITYOWN and NONCEO\_EQUITYOWN results for H shares vs. Red Chip shares suggest that managerial equity ownership is comparable for non-state controlled H shares and Red Chip shares.

In terms of firm performance, A shares perform better than H shares and Red Chip shares using ROA, but Red Chip shares perform better than H and A shares using RET. In addition, A shares are more highly valued than H shares and Red chip shares using BM. This latter result is consistent with the general overvaluation of A shares documented in prior research (see, e.g., Wang and Jiang 2004). Idiosyncratic stock return volatility (IDIOSYNCRATICRISK) is lower in A shares than in H and Red Chip shares.

## 6.2. State controlled firms

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<sup>14</sup> We assume that the top executives of Red Chip firms live in Hong Kong. This may not be true because these firms have the majority of their business in China and thus the executives could reside in mainland China for most of the year. However, excluding lnCOSTOFLIVING from regression model (1) does not alter our inference.

The largest shareholder has a very high ownership in the state controlled firms (PARENT\_OWN). The median PARENT\_OWN is more than 50% for each of the three firm types. Furthermore, for the 82 firms whose PARENT\_OWN is less than 50%, the second largest shareholder's median stock ownership is only 27.6% of the largest shareholder's stock ownership (results not tabulated). These results suggest that the state should have a clear control over the management of the three types of state-controlled firms.

Similar to non-state controlled firms, the median annual cash compensation to the average top executive (CASHPAY) increases monotonically from A shares to Red Chip shares. Again part of the difference is due to the higher cost of living for H and Red Chip firms. It is interesting to note that despite the significant difference in firm size (ASSETS) for state-controlled firms and non-state controlled firms, state controlled firms' CASHPAY is not significantly larger than that of non-state controlled firms. This evidence suggests that managers in state controlled firms are underpaid relative to managers in the private sector.

The median CEO\_EQUITYOWN and median NONCEO\_EQUITYOWN increase monotonically from A shares to Red Chip shares and differs significantly from each other using ranksum tests except that the median CEO\_EQUITYOWN is only marginally significantly different for A shares and H shares (two-tailed  $p=0.121$ ). This evidence is consistent with the bonding hypothesis, but H shares' managerial equity ownership is still lower than Red Chip shares'.

Similar to non-state controlled firms, A shares' firm performance is better than that of H shares and Red Chip shares using ROA during our sample period, but Red Chip

shares and H shares perform much better than A shares in terms of RET. In addition, A shares tend to be more highly valued than H shares and Red Chip shares using BM. Similar to non-state controlled firms, idiosyncratic stock return volatility (IDIOSYNCRATICRISK) is lower in A shares than in H and Red Chip shares.

### 6.3. A comparison of non-state controlled firms and state controlled firms

Non-state controlled firms and state controlled firms in table 1 differ on several important dimensions. The largest shareholder's stock ownership (PARENT\_OWN), Firm size (ASSETS), and the book to market ratio (BM) are lower in non-state controlled firms than in state controlled firms. Except for A shares, the equity ownership by the CEO and other top executives (CEO\_EQUITYOWN and NONCEO\_EQUITYOWN) is higher in non-state controlled firms while firm age is generally lower in non-state controlled firms.

These characteristic differences suggest that non-state controlled firms tend to be smaller, younger, and growing firms. These differences raise concerns on potential self selection biases of non-state controlled firms vs. state controlled firms. For example, one may ask whether profitable and better governed SOEs (state owned enterprises) were more likely to be privatized and became non-state controlled firms and vice versa. Fortunately, such self selection biases do not exist in our sample because neither Chinese entrepreneurs nor SOEs had the option to select their firms' ownership structure. Entrepreneurs for our non-state controlled firms did not have the option to become a state controlled firm. The Chinese government has not allowed large SOEs to become privately controlled for the fear of control loss and massive layoff of SOE employees.

However, over the past two decades small to medium size SOEs have been allowed to be sold to private investors. We have deleted those firms as part of our sample selection procedures in section 4.

## 7. Regression Results

### 7.1. Annual cash compensation regressions

Table 2 reports the results from the OLS regressions of  $\ln\text{CASHPAY}$ . We use Cook's (1977) distance statistic to eliminate outliers from all the reported regressions in table 2. To reduce multicollinearity,  $\ln\text{ASSETS}$  is demeaned in all regressions (Aiken and West 1991). We find no evidence of multicollinearity for all the regressions in table 2.

#### 7.1.1. Non-state controlled firms

Columns (1) to (3) report the regression results for non-state controlled firms. We use both ROA and RET as measures of firm performance in column (1) because the three types of firms may place different weights on the two performance measures. As a sensitivity check, we report the regression results using ROA in column (2) and using RET in column (3). Focusing on the regression result in column (1), we find that except for the significantly positive coefficient on ROA, all the other coefficients associated with ROA and RET are not significantly positive. The results for columns (2) and (3) do not affect the inference. Overall, the results for A shares vs. H shares are inconsistent with the bonding hypothesis. Furthermore, it is surprising that Red Chip shares' sensitivity of managerial cash pay to performance is never significantly positive given that they enjoy the best investor protection among the three firm types. However, given

the large number of regressors and the small sample sizes for H shares and Red Chip shares, the insignificant coefficients on our test variables  $PERF \times H$  and  $PERF \times REDCHIP$  could be partially due to low test power.

As expected, the coefficients on  $\ln COSTOFLIVING$  and  $\ln ASSETS$  are significantly positive. The coefficients on the interactions between the control variables and  $PERF$  are insignificant.

#### 7.1.2. State controlled firms

Columns (4) to (6) report the results from the same set of regressions for state controlled firms. Because the inference from column (5) or (6) is similar to that from the comprehensive model in column (4), we focus on the results in column (4) instead. Consistent with the bonding hypothesis, the coefficient on  $RET \times H$  is significantly positive but inconsistent with the bonding hypothesis, the coefficient on  $ROA \times H$  is negative but insignificant. As expected, the coefficients on  $ROA \times REDCHIP$  and  $RET \times REDCHIP$  are both positive but significant for  $RET \times REDCHIP$  only. In addition, the coefficients on  $RET \times H$  and  $RET \times REDCHIP$  are significantly different from each other (two-tailed  $p=0.004$ ) while the coefficients on  $ROA \times H$  and  $ROA \times REDCHIP$  are weakly significantly different from each other (two-tailed  $p=0.158$ ). Furthermore, we find that for a one standard deviation increase in both  $ROA$  and  $RET$ , top executives' annual cash compensation increases by 22.7% for A shares, 54.4% for H shares and 126% for Red Chip shares.<sup>15</sup> The difference in the cash pay for performance sensitivity across the

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<sup>15</sup> The 22.7% for A shares is computed as  $e^{(3.362 \cdot SD_{roa} - 0.298 \cdot SD_{ret})} - 1$ , where  $SD_{roa}$  and  $SD_{ret}$  are A shares' standard deviation of  $ROA$  and  $RET$ , respectively. The 54.4% for H shares is computed as  $e^{(3.362 - 0.375) \cdot SD_{roa} + (-0.298 + 0.441) \cdot SD_{ret}} - 1$ , where  $SD_{roa}$  and  $SD_{ret}$  are H shares' standard deviation of  $ROA$  and  $RET$ , respectively. The 126% for Red Chip shares is computed in a similar fashion.

three firm types is unlikely to exist prior to the stock listing because it is well recognized that large state owned enterprises (SOEs) lack a strong pay for performance sensitivity. Those results suggest that cross listing helps improve H shares' cash pay for performance sensitivity to some extent but not to a level comparable to that of Red Chip shares. The result for Red Chip shares suggests that the influence of the state is significantly reduced with respect to the design of the managerial annual cash compensation in state controlled Red Chip firms.

Similar to non-state controlled firms, the coefficients on  $\ln\text{ASSETS}$  and  $\text{COSTOFLIVING}$  are significantly positive. Consistent with Smith and Watts (1992), the coefficient on  $\text{ROA} \times \text{BM}$  is negative and significant. Interestingly, despite the business complexity associated with conglomerates, the pay for performance sensitivity ( $\text{ROA} \times \text{CONGLOMERATE}$ ) is weaker for conglomerates.

### 7.1.3. Sensitivity checks

To ensure that the significant results in column (4) of table 2 are not due to omitted determinants of the pay for performance sensitivity, we performed a series of sensitivity checks. The coefficients on our variables of interest in column (4) of table 2 are robust to each sensitivity check except that the coefficient on  $\text{RET} \times \text{H}$  becomes insignificant for sensitivity checks 3 and 4 below. Due to the small sample size, we did not include all the control variables in one single regression. First, we included a dummy for negative ROA and its interaction with ROA to control for the non-linearity in the coefficient on ROA. The added interaction term is insignificant. Second, because Leone et al. (2006) find that CEO's cash compensation is more sensitive to negative abnormal

returns than positive abnormal returns, we included a dummy for negative RET and its interaction with RET. In addition, we also allowed these two coefficients to vary with H and REDCHIP. We find weak evidence consistent with Leone et al. (2006) for state controlled Red Chip shares but not for the other firms. Third, following Aharony et al. (2000), we included a dummy for the protected industries by the Chinese Government (defined as petrochemicals, energy, and raw materials) and its interaction with ROA and RET to further control for the difference in the pay for performance sensitivity for protected industry firms. The interaction between the protected industry dummy and ROA is marginally significantly negative. Fourth, we allowed the coefficient on ROA and RET to vary with PARENT\_OWN to control for the influence of ownership concentration on the pay for performance sensitivity (Ke et al. 1999). These two added interaction terms are insignificant. Fifth, we allowed the coefficients on ROA and RET to vary with an index of market development in our sample firms' headquarters developed by Fan and Wang (2004). This sensitivity controls for the alternative explanation that the pay for performance sensitivity is stronger in more developed regions in China. The interaction between ROA and the market development index is significantly positive.

## 7.2. Managerial equity ownership regressions

Table 3 reports the Tobit regression results of CEO\_EQUITYOWN and NONCEO\_EQUITYOWN for non-state controlled firms in columns (1) and (2) and for state controlled firms in columns (3) and (4).

### 7.2.1. Non-state controlled firms

Column (1) reports the results for CEO\_EQUITYOWN. Inconsistent with the bonding hypothesis, the coefficient on H is positive but insignificant. In addition, the coefficient on REDCHIP is also insignificant. However, these results should be interpreted with caution because as we have indicated above, non-state controlled firms' CEO\_EQUITYOWN likely represents equity ownership by the founding family.

Column (2) reports the results for NONCEO\_EQUITYOWN. Consistent with the bonding hypothesis, the coefficient on H is significantly positive for other top executives. In addition, the coefficient on REDCHIP is positive and marginally significant (two-tailed  $p=0.105$ ). However, the coefficients for H and REDCHIP are not significantly different from each other in column (2) (two-tailed  $p=0.532$ ). This latter result suggests that cross listing has significantly boosted H shares' use of managerial equity incentives to a level comparable to that of RED Chip shares for non-state controlled firms. The coefficients on the control variables are insignificant for the regression in column (2).

### 7.2.2. State controlled firms

Inconsistent with the bonding hypothesis, the coefficient on H for state controlled firms is insignificant in both columns (3) and (4). The coefficient on REDCHIP is significantly positive and larger than that on H (two-tailed  $p=0.018$  in column (3) and  $0.007$  in column (4)). The difference in managerial equity ownership between Red Chip shares and H shares or A shares is unlikely to exist prior to the stock listing because state owned enterprises (SOEs) are not allowed to offer managerial equity incentives. These results suggest that cross listing does not significantly increase the level of managerial

equity ownership in state controlled H shares relative to state controlled A shares or state controlled Red Chip shares. The results for state controlled firms stand in sharp contrast to those for non-state controlled firms, suggesting that state control imposes a significant constraint on H shares' management, which in turn offsets the benefit of cross listing. The results for Red Chip shares suggest that the influence of the state is significantly reduced with respect to the design of managerial equity incentives in state controlled Red Chip firms.

Consistent with prior research in the U.S., value firms (BM), large firms (lnASSETS), and firms in regulated utilities industry (UTILITIES) report lower levels of managerial equity ownership, but the coefficients on those variables are not always significant in columns (3) and (4).

### 7.2.3. Sensitivity checks

We performed several sensitivity checks to further rule out potential alternative explanations for the results in table 3. First, we included a dummy for the protected industries. Second, we controlled for PARENT\_OWN. Third, we added the index of market development in our sample firms' headquarters developed by Fan and Wang (2004). None of the sensitivity checks altered our inferences in table 3. In addition, most of the additional control variables are insignificant.

As a further sensitivity check, we redefine the dependent variable EQUITYOWN using Core and Guay's (1999) approach, defined as the dollar value change in managerial stock and option ownership to a 1% change in stock price. We assume a constant option delta of 50%, a conservative value because Core and Guay (1999) find that the option

delta for a typical newly granted stock option in the U.S. is 75%. Results for non-state controlled firms and state controlled firms are qualitatively the same except that the coefficients on H and REDCHIP for non-state controlled firms in column (2) become insignificant at conventional significance levels for the NONCEO\_EQUITYOWN regression.

### 7.3. CEO turnover regressions

Before discussing the Cox hazard regression results in table 4, we first report some descriptive statistics for the CEO turnover sample over 1999-2004. Because usually no clear reasons are given for managerial turnover in Chinese firms, we retain all the CEO turnover observations during 1999-2004 except for those due to normal retirements. However, results are similar if normal retirements are included in the analysis. There are 284 CEO turnovers over 1927 firm year observations in our sample, or a rate of 14.7%. For non-state controlled firms, the rate of CEO turnover is 20.2% for A shares, 2.6% for H shares, and 10.5% for Red Chip shares. For state controlled firms, the rate of CEO turnover is 16.5% for A shares, 9.4% for H shares, and 11.5% for Red Chip shares. For both non-state controlled firms and state controlled firms, the rate of CEO turnover is much higher for A shares than for H or Red Chip shares. The higher CEO turnover rate for A shares is consistent with prior research (see, e.g., Firth et al. 2006).

Table 4 reports the results from the Cox hazard regressions of CEO turnover over the period 1999-2004. The results for non-state controlled firms are reported in columns (1)-(3) while the results for state controlled firms are reported in columns (4)-(6).

### 7.3.1. Non-state controlled firms

The results in column (1) indicate that A shares' CEO turnover is sensitive to  $\Delta$ ROA but not to RET. The insensitivity of A shares' CEO turnover to RET may not be surprising because prior research (see, e.g., Su 2003) indicates that A shares' stock returns are not very informative as a measure of firm performance. Consistent with the bonding hypothesis, the sensitivity of CEO turnover to  $\Delta$ ROA (but not to RET) is more negative for H shares than for A shares. Actually the coefficient on  $RET \times H$  is significantly positive, inconsistent with the bonding hypothesis. In contrast, the sensitivity of CEO turnover to RET (but not to  $\Delta$ ROA) is marginally more negative for Red Chip shares than for A shares (two-tailed  $p=0.113$ ). These results suggest that when determining CEO turnover, H shares place more weight on accounting performance while Red Chip shares place more weight on stock returns, but both types of firms' CEO turnover is more sensitive to firm performance than A shares' CEO turnover. The regression results in columns (2) and (3) provide further collaborative evidence consistent with those in column (1). The sensitivity of CEO turnover to firm performance in non-state controlled firms is pretty surprising because many of those firms' CEOs are a founder and thus could not be easily replaced.

Given the different weights H shares and Red Chip shares place on  $\Delta$ ROA and RET, it is difficult to assess whether H shares' CEO turnover is more sensitive to firm performance than Red Chip shares' CEO turnover. As a result, we compute the change in the hazard rate of CEO turnover for a one standard deviation increase in both  $\Delta$ ROA and RET for H shares and Red Chip shares relative to A shares over the period 1999-2004. For the regression model in column (1) of table 4, we find that for a one standard

deviation increase in both  $\Delta$ ROA and RET, the hazard rate of CEO turnover is reduced by 13.8% for A shares, 46.6% for H shares and 95.8% for Red Chip shares.<sup>16</sup> This evidence suggests that H shares' sensitivity of CEO turnover to firm performance is stronger than that of A shares but still weaker than that of Red Chip shares.

### 7.3.2. State controlled firms

In contrast to the results for non-state controlled firms, the results in columns (4) indicate that the coefficients on  $PERF \times H$  and  $PERF \times REDCHIP$  are never significantly negative for both  $\Delta$ ROA and RET. More surprisingly, the coefficients on  $\Delta$ ROA  $\times$  H and  $\Delta$ ROA  $\times$  REDCHIP are in fact significantly positive.<sup>17</sup> These results are inconsistent with the bonding hypothesis and strongly suggest that the appointment and termination of executive managers in state controlled H and Red Chip share firms are significantly influenced by the Communist Party politics but are not designed to maximize individual firms' shareholder value. The results for Red Chip shares are particularly surprising because they stand in direct contrast to the cash compensation and equity ownership results in tables 2 and 3, suggesting that the Chinese government has a firmer grip on the personnel decisions than other management decisions in state controlled H shares and Red Chip shares, which are strategically more important to the Chinese government than the A shares. This latter evidence is consistent with the anecdotal evidence of managerial turnover discussed in section 3.

<sup>16</sup> The -13.8% for A shares is computed as  $e^{(-4.032 \times SD_{\Delta roa} + 0.135 \times SD_{ret})} - 1$ , where  $SD_{\Delta roa}$  and  $SD_{ret}$  are A shares' standard deviation of  $\Delta$ ROA and RET, respectively. The -46.6% for H shares is computed as  $e^{(-4.032 - 22.012 \times SD_{\Delta roa} + (0.135 + 2.015) \times SD_{ret})} - 1$ , where  $SD_{\Delta roa}$  and  $SD_{ret}$  are H shares' standard deviation of  $\Delta$ ROA and RET, respectively. The -95.8% for Red Chip shares is computed in a similar fashion.

<sup>17</sup> The positive coefficients on  $\Delta$ ROA  $\times$  H and  $\Delta$ ROA  $\times$  REDCHIP suggest that the managerial turnover we observe in the large state controlled firms is often a promotion for good performance rather than a punishment for bad performance. This evidence is consistent with the anecdotal evidence discussed in section 3.

#### 7.4. Self selection bias

So far we have treated as exogenous the stock listing decision of A shares, H shares, and Red Chip shares. We now discuss how mainland Chinese controlled firms' self selection into one of the three stock listing choices may affect our regression results. Doidge et al. (2005) show that foreign firms whose controlling shareholders and management enjoy more control rights relative to their cash flow rights are less likely to have their firms cross listed in the U.S., a country with strong investor protection. Their evidence suggests that H shares and Red Chip shares may be inherently better in terms of investor protection than A shares and thus we should observe a stronger pay for performance sensitivity regardless of where those firms are listed. This self selection bias may explain the stronger pay for performance sensitivity of H shares and Red Chip shares relative to A shares for non-state controlled firms, but cannot explain the difference in results across A shares, H shares, and Red Chip shares for state controlled firms.

We also believe that the above mentioned self selection bias, if exists, should not be as severe in China as in other countries. This is because the stock listing decision in China is tightly controlled by the Chinese government and is not solely subject to the discretion of firm management and shareholders. Because of the randomness in the bureaucratic regulatory approval process, Chinese firms' stock listing decision is more random than that of other countries. The domestic stock markets were started as an experiment to help ailing state owned enterprises (SOE) raise capital for their restructuring. In addition, Chinese firms that wish to go public on the domestic stock exchanges have to satisfy stringent financial requirements while firms that wish to raise

capital from overseas markets are required to first obtain the permission from the China Securities and Regulatory Commission (the counterpart of the SEC in the U.S.). For example, the Chinese Company Law (1994, 1999) requires a firm to have a minimum share capital of RMB ¥50 million (approximately US\$6 million) after the IPO, show accounting profit for at least three consecutive years immediately prior to the IPO, and have more than 1,000 shareholders who each hold shares with a nominal value of over RMB ¥1,000. As a comparison, the Hong Kong Growth Enterprise Market (GEM) of the Hong Kong Stock Exchange does not require a firm to show an accounting profit prior to the IPO, and requires only a minimum of 2-year track record (could be one year for certain large firms).

As a result, many non-state controlled firms, which tend to be smaller growth firms and have a shorter track record, did not have the option to list their firms on the domestic stock exchanges. For the firms that were eligible to be listed on the domestic stock exchanges, they still had to fight for the limited number of explicit or implicit IPO quotas available each year (see Tian and Meggison 2006). Furthermore, for many years large SOEs were not allowed to be listed on the domestic stock exchanges for the fear that the IPO size of the large SOEs could further depress the already poor performance of the domestic stock markets. As a matter of fact, the Chinese government virtually stopped processing domestic IPO applications over 2002-2004. Instead, the Chinese government has forced many large SOEs to list their shares as H shares on the Hong Kong Stock Exchange. Therefore, mainland Chinese firms, whether SOEs or not, often did not have the luxury of choosing their own stock listing location. There is also no

evidence that the Chinese government systematically chose the better governed firms for overseas listings.

#### 7.5. Summary of results

Table 5 provides a summary of our hypothesis tests using the three pay for performance sensitivity measures reported in tables 2-4. The null hypothesis  $A \leq H$  represents the null that the pay for performance sensitivity for H shares is not greater than that for A shares while the null hypothesis  $H = \text{REDCHIP}$  represents the null that the pay for performance sensitivity is the same for H shares and Red Chip shares. For non-stated controlled firms, the null  $A \leq H$  is rejected for two out of the three pay for performance sensitivity measures while the null  $H = \text{REDCHIP}$  is rejected for only one of the three measures. As a result, we conclude that for non-state controlled firms, H shares' pay for performance sensitivity has improved relative to A shares', and is closer to that of Red Chip shares.

For state controlled firms, the null  $A \leq H$  is rejected for only one of the three pay for performance sensitivity measures. Thus, we conclude that state controlled H shares' pay for performance sensitivity has not significantly improved relative to that of state controlled A shares. The difference in results between state controlled firms relative to non-state controlled firms suggests that state control reduces the benefits of cross listing as a bonding mechanism. Because the null  $H = \text{REDCHIP}$  is rejected for two of the three measures, we conclude that state controlled H shares' pay for performance sensitivity is significantly lower than that of state controlled Red Chip shares. The difference in results between state controlled H shares and state controlled Red Chip shares suggests that

except for top executive turnover, the influence of the state is significantly reduced in Red Chip shares with respect to the design of the managerial pay for performance sensitivity.

## 8. Conclusion

In this study we use a sample of Chinese firms (A shares, H shares, and Red Chip shares) to test the effect of cross listing on the sensitivity of managerial compensation to firm performance. We also test whether state ownership reduces the positive cross listing effect. We measure the managerial pay for performance sensitivity in three ways: a) the sensitivity of managerial annual cash compensation to firm performance; b) the level of managerial equity ownership (stock and stock options); and c) the sensitivity of CEO turnover to firm performance. The sample firms are all controlled by mainland Chinese and operate their main business in mainland China, but they differ in terms of incorporation and listing locations. A shares are incorporated in mainland China and trade on a domestic stock exchange. H shares are incorporated in mainland China but cross list on the HK Stock Exchange. Red Chip shares are incorporated outside mainland China and trade on the HK Stock Exchange. We use A shares as a proxy for firms from poor investor protection countries, Red Chip shares as a proxy for firms from good investor protection countries, and H shares as a proxy for firms from poor investor protection countries but cross list in a good investor protection country. To determine the effect of state control on the managerial pay for performance sensitivity, we analyze the three pay for performance sensitivity measures across the three firm types for state controlled firms and non-state controlled firms separately.

Consistent with the bonding hypothesis in the cross listing literature, we find that for non-state controlled firms, the pay for performance sensitivity is stronger for H shares than for A shares, and there is some evidence that H shares' pay for performance sensitivity is closer to that of Red Chip shares. Inconsistent with the bonding hypothesis, we find that for state controlled firms, the pay for performance sensitivity is generally similar for A shares and H shares. In addition, there is no evidence that H shares' pay for performance sensitivity is closer to that of Red Chip shares. The difference in results between state controlled H shares and state controlled Red Chip shares suggests that the influence of the state is significantly reduced in the management of Red Chip shares.

Our results have several implications for the literature. First, we demonstrate the importance of home country institutional forces as a moderating factor in the positive effect of cross listing. Our evidence suggests that incorporating those home country institutional factors would significantly increase our understanding on the effect of cross listing on cross listed firms' behavior. Second, our results also suggest that cross listing will unlikely substitute for the building of strong home country investor protection institutions. Third, our evidence suggests that the HK Stock Exchange is not effective as a bonding mechanism for state controlled H shares and thus suggests caution for investors who wish to invest in those firms. Finally, our paper also contributes to the existing executive compensation literature that has predominantly focused on publicly traded U.S. firms. Our contribution is to document the current status of managerial incentive compensation structure across a wide range of publicly traded firms in China, an economy with rising significance.

There are several important caveats with regard to the interpretation of our findings. First, our evidence is based on one country and thus it may not be applicable to other economies. However, we note that state ownership is not unique to China and there is ample evidence that the state often has objectives other than shareholder value maximization, suggesting that the documented influence of state ownership on cross listing benefits may not be unique to China. Second, because we analyze only the effect of cross listing on the managerial pay for performance sensitivity, we cannot rule out potential positive effects of cross listing on other internal governance mechanisms (e.g., board of directors). Finally, the fact that cross listing has little impact on the managerial pay for performance sensitivity for state controlled H shares does not imply that such contractual arrangements are suboptimal from the perspective of the state planner that is not always interested in shareholder value maximization.

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## **Appendix: Key differences between PRC and HK company laws**

This appendix summarizes the key differences between the PRC (People's Republic of China) Company Law applicable to a joint stock limited company incorporated in mainland China and the HK company law applicable to a company incorporated in Hong Kong. In addition, we discuss two key regulations promulgated by the Chinese government that eliminate or reduce the differences between the two company laws and are required to be followed by all mainland Chinese firms seeking stock listings on the HK Stock Exchange: (a) the Special Regulation on Overseas Offering and Listing of Shares by Joint Stock Limited Companies issued by the State Council on August 4, 1994 (referred to as the Special Regulation); and (b) the Mandatory Provisions for Companies Listing Overseas issued by the China Securities and Regulatory Commission (CSRC) on September 29, 1994 (referred to as the Mandatory Provisions). The following summary borrows directly (with minor modifications) from the prospectus (Appendix VII) of China Construction Bank Corporation (HK stock code=939), an H share firm that went public on the HK Stock Exchange in 2005.

### Financial assistance for acquisition of shares

The HK company law but not the PRC Company Law prohibits a joint stock limited company or its subsidiaries from providing financial assistance for the purpose of an acquisition of its own or its holding company's shares. The Mandatory Provisions contain certain restrictions on a company and its subsidiaries providing such financial assistance similar to those under HK company law.

## Variation of class rights

Under the HK company law, if the share capital of a company is divided into different classes of shares, special rights attaching to any class of shares may only be varied if approved by a specified proportion of the holders of the relevant class. The PRC Company Law does not contain such a provision relating to variation of class rights. Under the Mandatory Provisions, class rights may not be varied or abrogated unless approved by a special resolution of shareholders in general meeting and by two-thirds or more of the votes cast by shareholders of the affected class present in person or by proxy at a separate class meeting. For the purpose of a variation of class rights, domestic shares and foreign shares are treated as separate classes of shares except in the case of (i) an issue of shares by the joint stock limited company in any 12 month period either separately or concurrently following the approval by a special resolution of shareholders in general meeting not exceeding 20% of each of the issued domestic shares and foreign shares existing as at the date of such special resolution; and (ii) an issue of domestic shares and foreign shares in accordance with the plan of the company approved by the securities authority and which are completed within 15 months following the establishment of the company. The Mandatory Provisions contain detailed provisions relating to circumstances which are deemed to constitute a variation of class rights.

## Directors

The PRC Company Law, unlike the HK company law, does not contain any requirements relating to the declaration of interests in material contracts, restrictions on interested directors being counted towards the quorum of and voting at a meeting of the

board of directors at which a transaction in which a director is interested is being considered, restrictions on directors' authority in making major dispositions, restrictions on companies providing certain benefits such as loans to directors and guarantees in respect of directors' liability and prohibition against compensation for loss of office without shareholders' approval. The Mandatory Provisions, however, contain requirements and restrictions in relation to the foregoing matters similar to those applicable under Hong Kong law.

#### Derivative action by minority shareholders

Hong Kong law permits minority shareholders to start a derivative action on behalf of all shareholders against directors who have been guilty of a breach of their fiduciary duties to the company, if they control a majority of votes at a general meeting thereby effectively preventing a company from suing the directors in breach of their duties in its own name. Although the PRC Company Law gives a shareholder of a joint stock limited company the right to initiate proceedings in the People's Court to restrain the implementation of any resolution passed by shareholders in general meeting or by the board of directors which violates any law or infringes the lawful rights and interests of shareholders, the PRC law does not have a form of proceedings which is the same as a derivative action. The Mandatory Provisions, however, provide remedies to the company against directors, supervisors and officers in breach of their duties to the company. In addition, every director and supervisor of a joint stock limited company applying for a listing of its foreign shares on the Hong Kong Stock Exchange is required

to give an undertaking in favor of the company to comply with the company's articles of association. This allows minority shareholders to act against directors and supervisors in default.

#### Protection of minority shareholders

Under Hong Kong law, a shareholder who complains that the affairs of a company incorporated in Hong Kong are conducted in a manner unfairly prejudicial to his interests may petition to court to either wind up the company or make an appropriate order regulating the affairs of the company. In addition, on the application of a specified number of members, the Financial Secretary may appoint inspectors who are given extensive statutory powers to investigate the affairs of a company incorporated in Hong Kong. The PRC law does not contain similar safeguards. The Mandatory Provisions, however, contain provisions to the effect that a controlling shareholder may not exercise its voting rights in a manner prejudicial to the interests of the shareholders generally or of some part of the shareholders of a company to relieve a director or supervisor of his duty to act honestly in the best interests of the company or to approve the expropriation by a director or supervisor of the company's assets or the individual rights of other shareholders.

#### Quorum for shareholders' meetings

Under Hong Kong law, the quorum for a general meeting is provided for in the articles of association of the company, which shall not in any event be less than two members. The PRC Company Law does not specify any quorum requirement for

shareholders' general meeting but the Special Regulations and the Mandatory Provisions provide that a company's general meeting can be convened when replies to the notice of that meeting have been received from shareholders whose shares represent 50% of the voting rights in the company at least 20 days before the proposed date of the meeting. If that 50% level is not achieved, the company shall within five days notify shareholders by public announcement and the shareholders' general meeting may be held thereafter.

#### Financial disclosure

A joint stock limited company is required under the PRC Company Law to make available at its office for inspection by shareholders its annual balance sheet, profit and loss account, changes in financial position and other relevant annexures 20 days before the annual general meeting of shareholders. In addition, a company established by the public subscription method under the PRC Company Law must publish its financial statements. The annual balance sheet has to be verified by registered accountants. The Companies Ordinance requires a company to send to every shareholder a copy of its balance sheet, auditors' report and directors' report which are to be laid before the company in its annual general meeting not less than 21 days before such meeting.

A joint stock limited company is required under the PRC law to prepare its financial statements in accordance with the PRC accounting standards. The Mandatory Provisions require that the company must, in addition to preparing accounts according to the PRC standards, have its accounts prepared and audited in accordance with International Financial Reporting Standards or Hong Kong accounting standards and its

financial statements must also contain a statement of the financial effect of the material differences (if any) from the financial statements prepared in accordance with the PRC accounting standards. The Special Regulations require that there shall not be any inconsistency between the information disclosed within and outside the PRC and that, to the extent that there are differences in the information disclosed in accordance with the relevant PRC and overseas laws, regulations and requirements of the relevant stock exchanges, such differences shall also be disclosed simultaneously.

#### Information on directors and shareholders

Under the PRC Company Law, neither the public nor the shareholders of a joint stock limited company have access to information on its directors and shareholders.

Under the Mandatory Provisions, shareholders have the right to inspect and copy (at reasonable charges) certain information about shareholders and directors similar to that available under Hong Kong law to shareholders of a company incorporated in Hong Kong.

#### Arbitration of disputes

In Hong Kong, disputes between shareholders and a company incorporated in Hong Kong or its directors may be resolved through the courts. The Mandatory Provisions provide that such disputes should be submitted to arbitration at either the HK International Arbitration Centre (HKIAC) or the China International Economic and Trade Arbitration Commission (CIETAC), at the claimant's discretion.

## Securities Arbitration Rules

The Articles of Association provide that certain claims arising from the Articles of Association or the PRC Company Law shall be arbitrated at either the CIETAC or the HKIAC in accordance with their respective rules. The Securities Arbitration Rules of the HKIAC contain provisions allowing an arbitral tribunal to conduct a hearing in Shenzhen for cases involving the affairs of companies incorporated in the PRC and listed on the Hong Kong Stock Exchange so that PRC parties and witnesses may attend. Where any party applies for a hearing to take place in Shenzhen, the tribunal shall, where satisfied that such application is based on bona fide grounds, order the hearing to take place in Shenzhen conditional upon all parties including witnesses and the arbitrators being permitted to enter Shenzhen for the purpose of the hearing. Where a party (other than a PRC party) or any of its witnesses or any arbitrator is not permitted to enter Shenzhen, then the tribunal shall order that the hearing be conducted in any practicable manner, including the use of electronic media. For the purpose of the Securities Arbitration Rules, a PRC party means a party domiciled in the PRC other than the territories of Hong Kong Special Administration Region, the Macau Special Administrative Region of the PRC and Taiwan.

Table 1. Descriptive statistics for non-state controlled firms and state controlled firms (N, mean, median, and standard deviation)

Variable name	Non-state controlled firms			State controlled firms		
	A shares	H shares	Red Chip shares	A shares	H shares	Red Chip shares
PARENT_OWEN	138 0.345 (0.297) [0.147]	27 0.367 (0.322) [0.157]	10 0.390 (0.376) [0.135]	120 0.522 (0.537) [0.173]	60 0.507 (0.549) [0.152]	35 0.543 (0.545) [0.151]
CASHPAY	138 0.171 (0.108) [0.186]	27 0.354 (0.223) [0.355]	10 1.284 (0.862) [0.996]	120 0.240 (0.190) [0.216]	60 0.443 (0.298) [0.559]	35 1.630 (1.151) [1.595]
CEO_EQUIYOWN	138 0.077 (0) [0.136]	27 0.236 (0.246) [0.201]	10 0.103 (0.008) [0.171]	120 0 (0) [0]	60 0.004 (0) [0.020]	35 0.012 (0.001) [0.031]
NONCEO_EQUIYOWN	138 0.004 (0) [0.012]	27 0.009 (0.002) [0.018]	10 0.004 (0.002) [0.006]	120 0 (0) [0]	60 0.001 (0) [0.002]	35 0.002 (0.001) [0.004]
COSTOFLIVING	138 0.007 (0.007) [0.002]	27 0.019 (0.010) [0.029]	10 0.087 (0.087) [0]	120 0.008 (0.007) [0.002]	60 0.014 (0.010) [0.020]	35 0.087 (0.087) [0]
ASSETS	138 1,974 (1,262) [2,434]	27 2,958 (722) [5,446]	10 2,225 (1,056) [2,709]	120 7,746 (5,974) [6,108]	60 44,295 (8,155) [123,690]	35 22,139 (5,016) [55,714]

ROA	138	26	10	120	60	35
	0.110	0.053	-0.033	0.138	0.079	0.042
	(0.102)	(0.070)	(-0.103)	(0.121)	(0.072)	(0.040)
	[0.082]	[0.112]	[0.120]	[0.094]	[0.094]	[0.078]
RET	138	24	9	120	59	34
	-0.243	-0.184	0.150	0.110	0.418	0.484
	(-0.275)	(-0.323)	(0.083)	(0.035)	(0.196)	(0.255)
	[0.247]	[0.547]	[0.435]	[0.373]	[1.076]	[0.885]
FIRMAGE	138	27	10	120	60	35
	5.819	2.778	5.9	6.258	5.1	6.829
	(6)	(2)	(4.5)	(6)	(6)	(6)
	[2.515]	[2.063]	[3.281]	[2.630]	[2.821]	[2.965]
BM	138	27	10	120	60	35
	0.323	0.726	1.670	0.470	1.079	1.466
	(0.309)	(0.531)	(0.778)	(0.436)	(0.745)	(1.201)
	[0.175]	[0.479]	[2.032]	[0.175]	[0.836]	[0.981]
IDIOSYNCARTICRISK	138	27	10	120	60	35
	-2.744	-2.090	-1.801	-2.762	-2.140	-2.010
	(-2.725)	(-2.032)	(-1.989)	(-2.765)	(-2.204)	(-2.013)
	[0.369]	[0.440]	[0.454]	[0.318]	[0.568]	[0.410]

Notes: State controlled firms refer to those whose largest shareholder is the state directly or indirectly. Non-state controlled firms refer to those whose largest shareholder is not the state directly or indirectly. A shares refer to firms that are incorporated in mainland China and trade on one of the two domestic stock exchanges. H shares refer to firms that are incorporated in mainland China and cross list on the HK Stock Exchange. Red Chip shares refer to firms that are incorporated outside mainland China and trade on the HK Stock Exchange. PARENT\_OWN is the stock ownership of the largest shareholder in the listed firm. CASHPAY is the average annual cash compensation in millions of RMB paid to the top executives. CEO\_EQUITYOWN is the stock and stock option ownership by the board chairman of the listed firm (the highest executive position in a Chinese firm). NONCEO\_EQUITYOWN is the average stock and stock option ownership by the top executives other than the CEO and chairman of the board. COSTOFLIVING is the cost of living in the listed firm's headquarters (in millions of RMB). ASSETS is the total assets in millions of RMB. ROA is operating income divided by the average total assets at the beginning and end of the year. RET is the fiscal year total return minus the market

index return. FIRMAGE is the number of years since the firm's IPO. BM is the ratio of book value of equity to the total market cap of the listed firm at the beginning of the year. IDIOSYNCRATICRISK is the natural logarithm of the standard deviation of the residuals from a 36-month market model regression as of the beginning of the year. For firms that do not have 36 months of returns, we require a minimum of 12 months of returns.

Table 2. OLS regressions of top executives' average annual cash compensation

	(1)	(2)	(3)	(4)	(5)	(6)
	Non-state controlled firms			State controlled firms		
	Performance = ROA and RET	Performance = ROA	Performance = RET	Performance = ROA and RET	Performance = ROA	Performance = RET
H	0.638 (0.058)*	0.726 (0.006)***	0.391 (0.014)**	0.670 (0.011)**	0.614 (0.005)***	0.497 (0.001)***
REDCHIP	0.816 (0.145)	0.357 (0.403)	0.114 (0.806)	0.153 (0.794)	-0.383 (0.443)	0.284 (0.538)
ROA	2.823 (0.032)**	2.894 (0.016)**		3.362 (0.010)**	2.457 (0.001)***	
ROA×H	-2.347 (0.238)	-3.507 (0.037)**		-0.375 (0.842)	0.124 (0.936)	
ROA×REDCHIP	3.870 (0.205)	3.533 (0.199)		2.734 (0.183)	4.881 (0.010)**	
RET	0.556 (0.116)		0.785 (0.012)**	-0.298 (0.149)		-0.215 (0.308)
RET×H	0.504 (0.233)		-0.107 (0.806)	0.441 (0.063)*		0.282 (0.220)
RET×REDCHIP	0.189 (0.904)		-1.498 (0.062)*	1.096 (0.000)***		0.890 (0.002)***
UTILITIES	-0.147 (0.524)	-0.379 (0.026)**	-0.544 (0.006)***	0.133 (0.649)	0.068 (0.794)	0.014 (0.926)
CONGLOMERATE	-0.123 (0.773)	0.390 (0.051)*	-0.300 (0.107)	0.235 (0.208)	0.116 (0.540)	-0.082 (0.605)
LnASSETS	0.256 (0.005)***	0.241 (0.001)***	0.312 (0.000)***	0.241 (0.000)***	0.221 (0.000)***	0.217 (0.000)***

BM	-0.077 (0.871)	0.350 (0.170)	-0.460 (0.051)*	-0.103 (0.196)	-0.056 (0.463)	-0.237 (0.005)***
lnCOSTOFLIVING	0.731 (0.000)***	0.706 (0.000)***	0.846 (0.000)***	0.730 (0.001)***	1.004 (0.000)***	0.699 (0.000)***
LnFIRMAGE	-0.218 (0.138)	-0.166 (0.231)	-0.220 (0.100)*	-0.240 (0.070)*	-0.220 (0.066)*	-0.203 (0.121)
ROA×UTILITIES		8.981 (0.000)***		-0.927 (0.668)	-0.883 (0.639)	
RET×UTILITIES			-0.761 (0.135)	-0.217 (0.459)		-0.384 (0.175)
ROA×CONGLOMERATE	-1.050 (0.676)	-2.469 (0.207)		-3.492 (0.030)**	-3.793 (0.028)**	
RET×CONGLOMERATE	-1.089 (0.236)		-1.114 (0.034)**	0.155 (0.754)		-0.104 (0.703)
ROA×lnASSETS	0.421 (0.446)	0.738 (0.137)		-0.625 (0.262)	-0.665 (0.113)	
RET×lnASSETS	0.192 (0.270)		0.108 (0.414)	0.062 (0.417)		0.138 (0.148)
ROA×BM	-2.336 (0.429)	-2.224 (0.217)		-4.222 (0.002)***	-3.097 (0.000)***	
RET×BM	-1.322 (0.196)		-1.391 (0.086)*	-0.010 (0.919)		-0.063 (0.557)
Constant	1.623 (0.050)*	1.198 (0.115)	2.621 (0.003)***	2.063 (0.076)*	3.419 (0.000)***	2.105 (0.026)**
Observations	153	161	155	195	202	199
Adjusted R-squared	0.524	0.564	0.572	0.574	0.590	0.522

Notes: The dependent variable for all the regressions is lnCASHPAY. H is a dummy for H shares. REDCHIP is a dummy for Red Chip shares. UTILITIES is a dummy for firms in the utilities industry. CONGLOMERATE is a dummy for conglomerates. lnASSETS is the natural logarithm of ASSETS. lnASSETS is demeaned in each column to avoid multicollinearity. LnCOSTOFLIVING is the natural logarithm of COSTOFLIVING. LnFIRMAGE is the natural logarithm of FIRMAGE. Variables with “×” are interaction terms.

See table 1 for other variable definitions. Outliers are deleted using Cook's (1977) distance statistics. Two-tailed p values are reported in parentheses. \*, \*\*, and \*\*\* indicate a significance level of 10%, 5%, and 1%, respectively.

Table 3. Tobit regressions of managerial equity ownership

	(1)	(2)	(3)	(4)
	Non-state controlled firms		State controlled firms	
	CEO only	Other top executives	CEO only	Other top executives
H	0.107 (0.176)	0.008 (0.044)**	0.001 (0.902)	-0.000 (0.917)
REDCHIP	0.039 (0.632)	0.005 (0.105)	0.025 (0.006)***	0.003 (0.003)***
IDIOSYNCRATICKRISK	0.037 (0.467)	-0.001 (0.869)	0.002 (0.606)	-0.000 (0.555)
LnASSETS	0.031 (0.060)*	-0.000 (0.820)	-0.006 (0.021)**	-0.001 (0.053)*
BM	0.037 (0.308)	-0.003 (0.213)	-0.009 (0.067)*	-0.000 (0.201)
UTILITIES	-0.242 (0.005)***	0.027 (0.201)	-0.013 (0.023)**	-0.001 (0.100)*
CONGLOMERATE	-0.041 (0.297)	-0.002 (0.456)	-0.006 (0.328)	-0.000 (0.736)
LnFIRMAGE	-0.104 (0.045)**	-0.002 (0.475)	-0.000 (0.884)	0.001 (0.169)
Constant	0.289 (0.139)	0.003 (0.783)	0.003 (0.826)	-0.002 (0.199)
Observations	175	175	215	215

Notes: The dependent variable is CEO\_EQUITYOWN in column (1) and (3) and NONCEO\_EQUITYOWN in columns (2) and (4). See tables 1 and 2 for variable definitions. Two-tailed p values are reported in parentheses. \*, \*\*, and \*\*\* indicate a significance level of 10%, 5%, and 1%, respectively.

Table 4. Cox hazard regressions of CEO turnover

	(1)	(2)	(3)	(4)	(5)	(6)
	Non-state controlled firms			State controlled firms		
	Performance = $\Delta$ ROA and RET	Performance = $\Delta$ ROA	Performance = RET	Performance = $\Delta$ ROA and RET	Performance = $\Delta$ ROA	Performance = RET
H	-0.171 (0.861)	-0.810 (0.536)	0.785 (0.440)	-0.453 (0.081)*	-0.529 (0.032)**	-0.295 (0.237)
REDCHIP	0.639 (0.339)	0.241 (0.782)	0.643 (0.281)	-0.387 (0.169)	-0.377 (0.155)	-0.260 (0.352)
$\Delta$ ROA	-4.032 (0.100)*	-3.761 (0.085)*		-4.625 (0.099)*	-4.049 (0.102)	
$\Delta$ ROA $\times$ H	-22.012 (0.001)***	-15.642 (0.040)**		11.006 (0.043)**	12.282 (0.005)***	
$\Delta$ ROA $\times$ REDCHIP	2.239 (0.721)	-0.882 (0.893)		6.194 (0.055)*	5.649 (0.049)**	
RET	0.135 (0.630)		-0.026 (0.924)	0.224 (0.609)		-0.103 (0.790)
RET $\times$ H	2.015 (0.046)**		-0.630 (0.807)	-0.095 (0.846)		0.334 (0.438)
RET $\times$ REDCHIP	-1.216 (0.113)		-1.532 (0.031)**	-0.146 (0.746)		0.186 (0.646)
LnASSETS	-0.447 (0.001)***	-0.439 (0.001)***	-0.478 (0.001)***	-0.010 (0.916)	-0.026 (0.775)	0.010 (0.915)
UTILITIES	-1.670 (0.010)**	-0.399 (0.538)	-1.709 (0.007)***	0.159 (0.468)	0.170 (0.435)	0.198 (0.362)
CONGLOMERATE	0.055 (0.836)	0.080 (0.762)	0.021 (0.937)	0.342 (0.203)	0.324 (0.201)	0.366 (0.180)
Year fixed effects	YES	YES	YES	YES	YES	YES

Observations	467	496	470	684	721	687
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Notes:  $\Delta$ ROA is defined as the annual change in total operating income scaled by the average total assets at the beginning and end of the year.  $\Delta$ ROA and RET are lagged one year relative to the CEO turnover year. See tables 1 and 2 for variable definitions. Two-tailed p values are reported in parentheses. \*, \*\*, and \*\*\* indicate a significance level of 10%, 5%, and 1%, respectively.

Table 5. Summary of the regression results in tables 2-4

	(1)	(2)	(3)
	Table 2	Table 3	Table 4
Panel A. Non-state controlled firms			
Null: $A \leq H$	Not rejected	Rejected	Rejected
Null: $H = \text{REDCHIP}$	Not rejected	Not rejected	Rejected
Panel B. State controlled firms			
Null: $A \leq H$	Rejected	Not rejected	Not rejected
Null: $H = \text{REDCHIP}$	Rejected	Rejected	Not rejected

Notes: “Null:  $A \leq H$ ” refers to the null hypothesis that the pay for performance sensitivity is not stronger for A shares than for H shares for each of the three pay for performance measures used in tables 2-4. “Null:  $H = \text{REDCHIP}$ ” refers to the null hypothesis that the pay for performance sensitivity is the same for H shares and Red Chip shares for each of the three pay for performance measures used in tables 2-4.