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Hong Kong stock listing and the sensitivity of managerial compensation to firm performance in state-controlled Chinese firms

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Abstract We compare the sensitivity of managerial cash compensation to firm performance, the level of long term managerial incentives, and the sensitivity of CEO turnover to firm performance for three types of state-controlled Chinese firms: A shares (firms incorporated and listed in mainland China), H shares (firms incorporated in mainland China but listed in Hong Kong), and Red Chip shares (firms incorporated outside mainland China and listed in Hong Kong). We find no difference in the three pay-for-performance sensitivity measures between H shares and A shares. The cash pay-for-performance sensitivity and the level of long-term managerial incentives are higher for Red Chip shares than for the other two firm types. However, the sensitivity of CEO turnover to firm performance is insignificant for all three firm types. Our study illustrates the complexity in the influence of mainland China's versus Hong Kong's institutional forces on state-controlled Chinese firms listed in Hong Kong.

Keywords Cross listing · Executive compensation · Government ownership · Hong Kong · China

JEL Classification J33 · J63 · K22 · N25 · N45

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1 Introduction

Prior research shows that due to weak investor protection in mainland China, managers of state-controlled Chinese firms that are incorporated and listed in mainland China (referred to as A share firms) are subject to a low pay-for-performance sensitivity (for example, Firth et al. 2006a, b; Conyon and He 2008). Allen et al. (2005) find that investor protection is stronger in Hong Kong than in mainland China. The objective of this study is to examine whether listing state-controlled Chinese firms in Hong Kong in the form of H shares (defined as firms that are incorporated in mainland China but listed in Hong Kong) or Red Chip shares (defined as firms that are incorporated outside mainland China and listed in Hong Kong) can help improve the managerial pay-for-performance sensitivity relative to that of state-controlled A share firms. An important hypothesis in the cross-listing literature, known as "the bonding hypothesis," posits that listing a foreign firm from a weak investor protection country on a stock exchange of a strong investor protection country helps improve the foreign firm's investor protection (Stulz 1999; Coffee 2002). A direct outcome of improved investor protection is an increase in the managerial pay-for-performance sensitivity (Lel and Miller 2008; DeFond and Hung 2004).

Following prior research (for example, Murphy 1999), we capture three different dimensions of the managerial pay-for-performance sensitivity: (a) the sensitivity of managerial annual cash compensation to firm performance, (b) the level of long term managerial incentives (that is, shares, stock options, and other long term incentives), and (c) the sensitivity of CEO turnover to firm performance.[1] We use both the annual accounting return on assets (ROA) and annual abnormal stock return as proxies for firm performance.

We find the following main results. First, consistent with prior research, there is little managerial pay-for-performance sensitivity in state-controlled A share firms. Second, we find no evidence that any of the three pay-for-performance sensitivity measures is stronger for state-controlled H shares than for state-controlled A shares. Third, the sensitivity of managerial cash compensation to firm performance and the level of long-term managerial incentives are higher for state-controlled Red Chip firms than for state-controlled A share firms. Fourth, the sensitivity of managerial cash compensation to firm performance and the level of long-term managerial incentives are higher for state-controlled Red Chip firms than for state-controlled H share firms. Finally, we find no evidence that the sensitivity of CEO turnover to firm performance is significant for any of the three firm types.

The empirical results suggest that mainland China's institutional forces (that is, weak investor protection) still dominate Hong Kong's institutional forces in shaping the behavior of state-controlled H shares. However, the influence of mainland

[1] State-controlled Chinese firm executives often enjoy significant perks commensurate with their job titles (Cai et al. 2005). We do not include perks in the annual cash compensation because data on perks are not readily available. The provision of perks could be a form of incentive pay if an executive's turnover is sensitive to firm performance. As shown later in Table **5**, we find little evidence that state-controlled Chinese firms' CEO turnover is sensitive to firm performance. Therefore, it seems unlikely that omitting perks would significantly affect our inferences.

China's institutional forces is substantially reduced while Hong Kong's institutional forces play a more significant role in governing the behavior of state-controlled Red Chip firms. Nevertheless, our evidence suggests that the Chinese government still tightly controls the appointment and termination of top executives in state-controlled Chinese firms. These results demonstrate the complexity in the influence of mainland China's institutional forces versus Hong Kong's institutional forces on the behavior of state-controlled H and Red Chip firms.

Our study is related to a large literature on the effect of overseas listings on firm behavior.[2] The majority of the studies in this literature focus on foreign listings on US stock exchanges. More importantly, most cross-listing studies exclude China from their samples. This omission is understandable because China is unique on many dimensions (for example, culture, political ideology, and economic system) and may not easily fit into existing western economic theories. On the other hand, China is one of the largest economies in the world, and its state-controlled H and Red Chip firms represent the backbone of its national economy, competing with foreign multinational corporations both at home and abroad. Thus, it is important to understand how overseas listings affect the behavior of state-controlled H shares and Red Chip shares. Furthermore, because state-controlled H shares and Red Chip shares are owned by the Chinese government, which has the ability to overwrite Hong Kong's institutional forces, it is unclear ex ante whether the bonding hypothesis developed in the US literature would apply to state-controlled Chinese firms listed in Hong Kong. The evidence from this study suggests that listing state-controlled Chinese firms abroad does not always lead to an automatic enhancement in investor protection.

The rest of the paper is organized as follows. Section 2 develops our research hypotheses. Section 3 describes the sample selection procedures and data sources. Section 4 presents the regression models for the three pay-for-performance sensitivity measures. Section 5 provides descriptive statistics on our sample firms, and Sect. 6 reports the regression results. Section 7 concludes.

2 Research hypotheses

2.1 Differences in investor protection across A shares, H shares, and Red Chip shares

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 that mainland China, along with Mexico and Indonesia, is one of the worst financial markets in terms of investor protection, while Hong Kong one of the best (See their figure 1).

Due to the differences in incorporation location and stock-listing location, the degree of investor protection could vary across A shares, H shares, and Red Chip

[2] See Karolyi (2006) for a comprehensive survey of this literature.

shares. Because A shares are incorporated and listed in mainland China, they should be directly influenced by mainland China's weak investor protection but not Hong Kong's strong investor protection. Hence, we expect minority shareholders of A shares to enjoy the least investor protection. As Red Chip shares are incorporated and listed outside of mainland China, they are not *directly* constrained by mainland China's weak investor protection. Red Chip shares, for example, are not required to follow mainland China's rigid Company Law and the relevant regulations issued by the China Securities and Regulatory Commission (CSRC), the counterpart of the US Securities and Exchange Commission. More importantly, Red Chip shares are directly subject to the influence of Hong Kong's strong investor protection. Therefore, minority shareholders of Red Chip shares are expected to enjoy better investor protection than those of A shares.

Incorporated in mainland China, H shares are subject to mainland China's Company Law and the relevant regulations issued by the CSRC. For example, prior to 2006 mainland China's Company Law did not allow listed firms incorporated in mainland China (that is, A shares and H shares) to grant stock options or restricted stock to company employees after an IPO. However, H shares are also subject to additional listing rules imposed by the Hong Kong Stock Exchange. These rules intend to compensate for the significant differences between mainland China's Company Law and Hong Kong's Companies Ordinance and aim to increase the protection of H shareholders to a level comparable to that of Hong Kong registered companies.[3] Therefore, H shares are directly subject to the influences of both mainland China's weak investor protection and Hong Kong's strong investor protection. As a result, we expect H shares to fall between A shares and Red Chip shares in terms of overall investor protection.

One important factor we have not considered so far is that the controlling shareholder of state-controlled H and Red Chip firms is the Chinese government. Even though Hong Kong follows a different legal system, it is part of China, and therefore the Chinese government has the ability to impose mainland's weak investor protection on state-controlled H shares and Red Chip shares and undo the influence of Hong Kong's strong investor protection.[4] In addition, there is no extradition arrangement between mainland and Hong Kong. Prior to the signing of the agreement between mainland and Hong Kong stock market regulators on cross-border investigations in 2007, mainland China's securities regulator CSRC was banned from helping Hong Kong regulators investigate cases involving Hong Kong listed firms (See Yiu 2007). Hence, even if an executive engages in wrongdoing while working for a state-controlled H share or Red Chip firm, he can easily escape the punishment of Hong Kong regulators by fleeing to the mainland. Therefore, a Hong Kong listing may not offer significant help in improving the investor protection of state-controlled H shares and Red Chip shares.

[3] See Appendix VII of the China Construction Bank's Prospectus for a detailed discussion of these provisions (available at http://www.hkexnews.hk/listedco/listconews/sehk/20051014/939/F135_e.pdf).

[4] Hong Kong 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 were promised to be unchanged for 50 years.

2.2 Investor protection and the managerial pay-for-performance sensitivity

Assuming that a firm's objective is to maximize shareholder value, a standard prediction from the agency theory is that managerial compensation is positively tied to firm performance (see Holmstrom 1979, Hermalin and Weisbach 1998). However, the controlling shareholder (that is, the government) of state-controlled Chinese firms often has nonshareholder value-maximizing objectives and thus may have little incentive to adopt a strong managerial pay-for-performance sensitivity. First, the Chinese government often requires state-controlled Chinese firms to share part of the government's social responsibilities by forcing them to maintain an excess level of employment. Because linking managerial pay to firm performance would naturally encourage state-controlled firms' managers to maximize shareholder value by laying off excess employees, which in turn would create a huge burden on the state that may not be politically and economically acceptable in the short run, the Chinese government may have a weak incentive to tie managerial pay to firm performance.

Second, pay inequality between senior executives and lower level employees is often viewed negatively in state-controlled Chinese firms. Historically, all employees of state owned enterprises (SOEs) received similar pay. In addition, due to the weak monitoring of state owned assets, significant pay inequality between senior executives and lower level employees could be viewed as evidence of senior executives' expropriation of state owned assets (See O'Neill 2010). Since a strong pay-for-performance sensitivity would inevitably lead to a wider variation in managerial compensation, critics might use the high managerial compensation in years of good managerial performance as evidence of managerial expropriation of state owned assets. Such serious allegations could lead to resentment among ordinary Chinese people and even undermine the power of the Communist Party (See Yam 2006 and Cheng 2007 for supporting evidence.). Therefore, the Chinese government may find it optimal to force state-controlled Chinese firms to choose a weaker pay-for-performance sensitivity to the detriment of shareholder-value maximization.

Finally, the Communist Party of China holds significant and direct influence over the management of state-controlled Chinese firms, especially with regard to the appointment and termination of top executives. The involvement of the party in state-controlled firms often reduces shareholder value because the its political interests often conflict with shareholders' interests (See Yu 2008). Party members, for example, are commonly favored over nonmembers (regardless of an individual's performance) in filling in key management positions within state-controlled firms. As a result, managers of state-controlled Chinese firms are often entrenched and face little pay-for-performance sensitivity (especially the sensitivity of managerial turnover to firm performance).[5]

[5] Anecdotal news reports suggest that the influence of the Chinese government is still prevalent in the management of state-controlled H shares and Red Chip shares, especially with regard to the appointment of top executives. 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),

Research by La Porta et al. (1998, 2000) and others suggests that minority shareholders' ability to curb insiders' expropriation depends on the level of a country's investor protection. Because investor protection in A share firms is expected to be the weakest among the three types of firms in our sample, we expect minority shareholders to have the least power to force A share firms to adopt a strong pay-for-performance sensitivity. For the reasons explained in Sect. 2.1, it is unclear whether the degree of investor protection is stronger in H shares and Red Chip shares than in A shares. Hence, it is an empirical question whether the managerial pay-for-performance sensitivity is stronger in state-controlled H shares and Red Chip shares than in state-controlled A shares. We state our research hypotheses in the null form below:

H1 The managerial pay-for-performance sensitivity is the same for state-controlled A shares and state-controlled H shares, ceteris paribus.

H2 The managerial pay-for-performance sensitivity is the same for state-controlled A shares and state-controlled Red Chip shares, ceteris paribus.

Our focus is the effect of Hong Kong listing on the managerial pay-for-performance sensitivity, but Red Chip shares are a unique form of listing that has received little attention in the cross-listing literature. As discussed in Sect. 2.1, the degree of investor protection may still differ for H shares and Red Chip shares because the latter are incorporated outside China and thus not directly subject to mainland China's securities laws and regulations. Thus, we also compare the pay-for-performance sensitivity between state-controlled H shares and state-controlled Red Chip shares stated in the following null hypothesis:

H3 The managerial pay-for-performance sensitivity is the same for state-controlled H shares and state-controlled Red Chip shares, ceteris paribus.

3 Sample selection procedures and data sources

Because many of our regression variables had to be hand collected, we limited our empirical analyses to state-controlled A, H, and Red Chip firms over the 2-year period of 2003 and 2004 except for the CEO turnover analysis described below. A firm is state-controlled if its largest shareholder is the Chinese government or a state owned enterprise, which is wholly owned by the Chinese government. To avoid potential IPO-related confounding effects, we require at least a 1-year gap between the IPO year and 2003. Since the managerial compensation structure of a publicly listed firm may change over time, we require our sample firms' IPO dates to be after 1990. Using the above sample restrictions, the number of usable H shares and Red Chip shares turned out to be smaller than expected. To increase power, we add all the

Footnote 5 continued
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).

state-controlled A shares, H shares, and Red Chip shares that went public in calendar years of 2002 and 2003. For those later additions, we employ the 2004 through 2005 data for the 2002 IPOs and the 2005 through 2006 data for the 2003 IPOs.

The number of unique firms included in our initial sample is 899 for state-controlled A shares, 62 for state-controlled H shares, and 45 for state-controlled Red Chip shares. To avoid potential confounding effects caused by product market differences, we limit our sample to firms that earned the majority of their revenues from mainland China (defined as more than 50%). This restriction results in a loss of nine Red Chip firms.

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 firms in terms of size, we retain only the top 15% of the state-controlled A shares based on total assets in the first year of the 2-year sample period. The 15% cutoff is chosen so that A share firms' median total assets are between the median total assets of Red Chip shares and H shares. Results are qualitatively similar using alternative cutoffs such as top 20% or top 10%. Finally, we require nonmissing total assets, book value of common equity, and stock prices. These sample selection restrictions result in a final sample of 133 state-controlled A shares, 62 state-controlled H shares, and 36 state-controlled Red Chip shares.

We limit the CEO turnover analysis to the firms included in the above final sample over the period of 1999 through 2004 because H and Red Chip shares' CEO turnover data have to be hand collected. The CEO in this paper refers to the chairman of the board, the highest-ranking executive in all three types of Chinese firms. Because our CEO turnover data do not differentiate voluntary and involuntary turnover, similar to Lel and Miller (2008), we retain all the CEO turnover observations during 1999 through 2004 except for CEOs who reached mandatory retirement age. However, results are similar if those normal retirements are included in the analysis.[6]

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 from annual reports, except accounting and stock return data, which we retrieve from the Worldscope database.

[6] A unique feature of state-controlled Chinese firms is that a CEO who performs well in a state-controlled firm (say X) may be promoted to a higher-ranking government position (for example, becoming a minister) or transferred to another more prestigious state-controlled firm (say Y) by the government, similar to a tournament (see Rosen 1986). Although such a CEO turnover may be viewed as a reward to the departing CEO of firm X, it does not maximize the shareholder value of firm X: firm X loses a good CEO if that CEO performs well, but firm X ends up keeping a bad one if he performs poorly. Therefore, though CEO turnover is sensitive to firm performance, the sensitivity is positive and thus is not consistent with shareholder value maximization. For this reason, we should not exclude such CEO turnover from our analysis.

4 Research design

4.1 Annual cash compensation

4.1.1 The level regression

We use both the level and change regression specifications to compare the differences in the sensitivity of managerial cash compensation to firm performance across state-controlled A shares, H shares, and Red Chip shares. Our level regression is specified as follows:

$$\begin{aligned}\text{LN(CASHPAY)} = {} & \beta_0 + \beta_1\text{PERF} + \beta_2 H + \beta_3\text{REDCHIP} + \beta_4\text{PERF} \times H + \beta_5\text{PERF} \\ & \times \text{REDCHIP} + \beta_6\text{CONTROL1} + \beta_7\text{PERF} \times \text{CONTROL1} \\ & + \beta_8\text{CONTROL2} + \varepsilon; \end{aligned} \quad (1)$$

See the appendix for all variable definitions. Since we do not have data on individual executives' cash compensation, the dependent variable LN(CASHPAY) is defined using the average annual cash compensation (including the cash bonus) of the top executives that is required to be disclosed in annual reports (the top three executives for A shares and the top five executives for H and Red Chip shares). Following Ke et al. (1999) and Leone et al. (2006), accounting performance is measured by ROA, and stock performance is measured by RET. We use both ROA and RET as proxies for firm performance (PERF) because the informativeness of the two measures as indicators of managerial performance could vary across firms and thus the weights on the two measures in our regression could vary across the three types of firms (for example, Lambert and Larcker 1987, Engel et al. 2003). PERF × H and PERF × REDCHIP are the test variables for our research hypotheses.[7]

In addition to corporate governance, the managerial cash pay-for-performance sensitivity is affected by many other factors even if a firm's objective is to maximize shareholder value. We attempt to control for those factors using CONTROL1

[7] ROA may not be comparable across the three types of firms because A shares and Hong Kong listed firms follow different financial reporting standards (local Chinese GAAP versus IAS). However, Chen et al.'s (2002) analyses suggest that the Chinese accounting standards in our sample period are largely harmonized with the accounting standards under IAS. Therefore, it seems unlikely that differences in accounting standards across the three types of firms are a significant issue in our study. Another concern with ROA is that earnings management could be more aggressive and thus the quality of ROA could be lower in state-controlled A share firms than in state-controlled H or Red Chip firms. Therefore, one would naturally expect the optimal weight on ROA in the cash compensation contract to be lower while the weight on alternative performance measures (for example, RET) to be higher in state-controlled A share firms than in state-controlled H or Red Chip firms (see Engel et al. 2003). Alternatively, one may also expect shareholders to turn to alternative compensation contracts (for example, long-term financial incentives) in order to motivate managers to increase shareholder value. Inconsistent with these alternative explanations, we find no evidence that the coefficient on RET is larger for state-controlled A shares in Table 2 or the level of long-term managerial incentives is higher for state-controlled A shares in Table 4.

interacted with PERF. The variables included in CONTROL1 are UTILITIES, CONGLOMERATE, LN(ASSETS), and BM. 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 LN(ASSETS) to further control for the potential impact of business operation complexity on the pay-for-performance sensitivity. We also include CONTROL2 to control for the determinants of managerial cash compensation levels. CONTROL2 includes LN(COSTOFLIVING) and LN(FIRMAGE). The coefficient on PERF is not allowed to vary with CONTROL2 because there is no theory to support such interaction effects.

To demonstrate the causal effect of Hong Kong listings on the pay-for-performance sensitivity, ideally we should compare the coefficients on PERF × H and PERF × REDCHIP for the same firms before and after the Hong Kong listings (see Lel and Miller 2008). Unfortunately, this approach is impossible for our sample because most of the H shares and all of the Red Chip shares were not publicly traded on mainland China as A shares and therefore we do not have the data to compute the managerial cash pay-for-performance sensitivity for those firms prior to the Hong Kong listings. However, this concern should not be severe for our state-controlled firms because it is well known that there is little managerial pay-for-performance sensitivity in state owned enterprises (SOEs) prior to the public listings. Therefore, the coefficient on PERF × H and PERF × REDCHIP for state-controlled firms are likely due to the Hong Kong listings rather than the inherent differences between H/Red Chip shares and A shares prior to the public listings. This logic also applies to the long-term managerial incentive regression model in Sect. 4.2 and the CEO turnover regression model in Sect. 4.3.

4.1.2 The change regression

To alleviate the concern of correlated omitted variables associated with the level regression, we follow Ke et al. (1999) by estimating the following change regression:

$$\begin{aligned}\Delta\text{LN(CASHPAY)} = {} & \beta_0 + \beta_1 \Delta\text{PERF} + \beta_2 \text{H} + \beta_3 \text{REDCHIP} + \beta_4 \Delta(\text{PERF} \times \text{H}) \\ & + \beta_5 \Delta(\text{PERF} \times \text{REDCHIP}) + \beta_6 \Delta\text{CONTROL1} \\ & + \beta_7 \Delta(\text{PERF} \times \text{CONTROL1}) + \beta_8 \Delta\text{CONTROL2} + \varepsilon; \qquad (2)\end{aligned}$$

ΔLN(CASHPAY) is the first difference in LN(CASHPAY). The other variables are defined similarly. While the change specification can more effectively control for unobserved correlated omitted firm fixed effects, a limitation of the change specification is that both the number and identities of executives included in LN(CASHPAY) could change over time and therefore the change specification could exacerbate the noise in LN(CASHPAY). The variables of interest for our hypothesis testing are Δ(PERF × H) and Δ(PERF × REDCHIP).

4.2 Long-term managerial incentives

To assess the difference in the level of long-term managerial incentives across state-controlled A shares, H shares, and Red Chip shares, we adopt the following regression model:

$$\text{DEPENDENTVAR} = \beta_0 + \beta_1 \text{H} + \beta_2 \text{REDCHIP} + \beta_3 \text{CONTROL} + \varepsilon; \quad (3)$$

See the appendix for all variable definitions. DEPENDENTVAR is either LONGTERMINCENTIVE or EQUITYOWN.[8] We use both dependent variables because they have both strengths and weaknesses. While LONGTERMINCENTIVE captures all kinds of long-term managerial incentives, it does not capture the magnitude of long-term incentives. By contrast, EQUITYOWN captures the magnitude of stock and option ownership, but it fails to capture the magnitude of other long-term incentive plans, which are difficult to quantify.

The test variables for our hypothesis tests are H and REDCHIP. Note that we do not include PERF and its interactions with H and REDCHIP because the dependent variables LONGTERMINCENTIVE and EQUITYOWN already depend on firm performance.

Following Core and Guay (1999), CONTROL includes IDIOSYNCRATICRISK, BM, UTILITIES, CONGLOMERATE, LN(ASSETS), and LN(FIRMAGE). Demsetz and Lehn (1985) argue that firms that operate in noisier environments (proxied by IDIOSYNCRATICRISK) 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 (proxied by BM) 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 also include UTILITIES and CONGLOMERATE to control for industry effects. We use LN(FIRMAGE) to control for the effect of firm age on the use of equity incentives. Finally, we use LN(ASSETS) to control for size effects.[9]

4.3 CEO turnover

We use the following Cox (1972) proportional hazard regression to study the sensitivity of CEO turnover to firm performance:

$$\text{h}(\text{t}|\text{x}(\text{t})) = \text{h}_0(\text{t})\text{e}^{[\text{x}(\text{t})'\beta]} \quad (4)$$

The dependent variable $\text{h}(\text{t}|\text{x}(\text{t}))$ is the hazard rate of CEO turnover. A higher hazard rate h(t) corresponds to a lower CEO tenure. $\text{h}_0(\text{t})$ is called the baseline

[8] Inference is similar if EQUITYOWN is defined 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.

[9] As EQUITYOWN includes managerial share ownership, regression model (3) implicitly assumes that shareholder value monotonically increases with managerial share ownership. However, this may not be true if the managerial share ownership becomes so high that the managers become entrenched. The evidence in Morck et al. (1988) suggests that the managerial entrenchment effect may exist when the managerial share ownership exceeds 5%. As managerial equity ownership for our sample firms rarely exceeds 5%, we do not believe that the entrenchment effect is a concern for our study.

hazard rate independent of x(t) and is left unspecified for the Cox hazard model. x(t) is a vector of time-varying explanatory variables that include PERF (ΔROA and RET), 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. See the appendix for all variable definitions. Following the managerial turnover literature (for example, DeFond and Hung (2004)), we use ΔROA instead of ROA as a measure of accounting performance. In addition, PERF is lagged 1 year relative to the CEO turnover year to avoid the overlap of firm performance for the departing CEO and the new CEO. The test variables for our hypotheses are PERF × H and PERF × REDCHIP.

5 Descriptive statistics

Table 1 reports the descriptive statistics for our sample firms over the sample period of 2003 and 2004. The values of all the relevant variables are denominated in the Chinese currency RMB. One US dollar equaled 8.26 RMB on December 31, 2003. The largest shareholder's (which is the Chinese government) stock ownership (PARENT_OWN) is high in our sample. The median PARENT_OWN is more than 50% for each of the three firm types. Furthermore, for the firms whose PARENT_OWN is less than 50%, the second largest shareholder's median stock ownership is only less than a third of the largest shareholder's stock ownership (results not tabulated). These results suggest that the Chinese government should have a clear control over the management of the three types of state-controlled firms.[10]

The median managerial cash compensation (CASHPAY) is 209,000 RMB for A shares, 310,000 RMB for H shares, and 1.131 million RMB for Red Chip shares. Part of the difference in cash pay across the three firm types can be explained by the difference in the cost of living (COSTOFLIVING) between Hong Kong and mainland Chinese cities. All A shares and 58 out of the 62 unique H shares are headquartered in mainland China, while all Red Chip shares are headquartered in Hong Kong.[11]

Less than 50% of the A shares and H shares have any kind of long-term incentive plans (LONGTERMINCENTIVE). By contrast, almost all of the Red Chip shares have some form of long-term incentive plans (mostly in the form of stock and

[10] With the presence of a controlling shareholder, the managerial pay-for-performance sensitivity for cash and equity compensation could be reduced because the controlling shareholder has the power to terminate the underperforming CEO (see Ke et al. 1999). However, we do not believe that the pay-for-performance sensitivity for cash and equity compensation will drop to zero. Furthermore, the controlling shareholder in our case is the Chinese government, and therefore it is unlikely that its monitoring is as intensive as a private controlling shareholder (see Shleifer 1998). Inferences are qualitatively similar if the coefficients on ROA and RET in model (1) are allowed to vary with PARENT_OWN or if PARENT_OWN is added to model (3).

[11] 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 part of the year. However, excluding LN(COSTOFLIVING) from regression model (1) does not alter our inference.

Table 1 Descriptive statistics of state-controlled Chinese firms (mean, median, and standard deviation)

Variable name	A shares N = 266	H shares N = 124	Red Chip shares N = 71
PARENT_OWN	0.529	0.509	0.539
	(0.549)	(0.549)	(0.518)
	[0.168]	[0.149]	[0.148]
CASHPAY	0.270	0.460	1.361
	(0.209)	(0.310)	(1.131)
	[0.254]	[0.542]	[1.139]
LONGTERMINCENTIVE	0.432	0.395	0.972
	(0)	(0)	(1)
	[0.496]	[0.491]	[0.167]
EQUITYOWN	0	0.004	0.010
	(0)	(0)	(0.001)
	[0]	[0.019]	[0.025]
COSTOFLIVING	0.008	0.013	0.087
	(0.007)	(0.010)	(0.087)
	[0.002]	[0.019]	[0]
ASSETS	8,629	45,619	23,482
	(6,595)	(8,708)	(5,546)
	[7,031]	[128,837]	[59,788]
ROA	0.070	0.067	0.043
	(0.062)	(0.056)	(0.038)
	[0.062]	[0.096]	[0.078]
RET	0.097	0.161	0.179
	(0.038)	(−0.093)	(0.001)
	[0.358]	[0.877]	[0.728]
FIRMAGE	6.455	5.726	7.366
	(6)	(6)	(7)
	[2.835]	[2.892]	[2.924]
BM	0.508	1.000	1.167
	(0.461)	(0.700)	(0.938)
	[0.205]	[0.826]	[0.879]
IDIOSYNCARTICRISK	−2.828	−2.194	−2.050
	(−2.842)	(−2.210)	(−2.054)
	[0.296]	[0.501]	[0.387]
UTILITIES	0.248	0.081	0.028
	(0)	(0)	(0)
	[0.433]	[0.273]	[0.167]
CONGLOMERATE	0.045	0.129	0.338
	(0)	(0)	(0)
	[0.208]	[0.337]	[0.476]

See the appendix for variable definitions. Even though we have 36 unique Red Chip firms, the sample size for the Red Chip firms is only 71 because one Red Chip firm was delisted in the second year of our sample period

options). Using the ranksum tests, the median LONGTERMINCENTIVE is not significantly different for A shares and H shares, but the median LONGTERM-INCENTIVE is significantly larger for Red Chip shares than for A shares or H shares. The median EQUITYOWN differs significantly from each other for A shares, H shares, and Red Chip shares except that the median EQUITYOWN is only marginally significantly different for A shares and H shares (two-tailed $p = 0.06$).

As expected, ROA and RET are significantly and positively correlated for each of the three firm types. There is no evidence that one firm type's performance measures always dominate those of the other two firm types. Consistent with the general higher valuation of A share firms documented in prior research (for example, Chan and Kwok 2005), the median BM is higher for A shares than for H shares and Red Chip shares. Idiosyncratic stock return volatility (IDIOSYNCRATICRISK) is significantly different among the three firm types with A shares having the lowest volatility and Red Chip shares having the highest volatility. There is also evidence that A share firms are more likely to operate in the utilities industry, while H and Red Chip firms are more likely to be conglomerates.

6 Regression results

6.1 Annual cash compensation

6.1.1 The level regression

Table 2 reports the OLS regression result of LN(CASHPAY). To reduce multicollinearity, LN(ASSETS) is demeaned in Tables 2 and 3 (Aiken and West 1991). The coefficient on ROA is significantly positive, but the coefficient on RET is insignificant. The coefficients on ROA × H and RET × H are both insignificant, suggesting no evidence that H shares' cash pay-for-performance sensitivity is stronger than that of A shares. However, the coefficients on ROA × REDCHIP and RET × REDCHIP are both significantly positive at the 10% two-tail level. In addition, the coefficient on RET × H is significantly different from the coefficient on RET × REDCHIP (two-tailed $p = 0.029$), even though the coefficient on ROA × H is not significantly different from the coefficient on ROA × REDCHIP (two-tailed $p = 0.697$). Thus, there is evidence that Red Chip shares' managerial cash pay-for-performance sensitivity is stronger than that of both A shares and H shares. In terms of economic significance, a one standard deviation increase in both ROA and RET is associated with an increase in top executives' annual cash compensation of 13% for A shares, 47% for H shares, and 80% for Red Chip shares.[12] Overall, our cash compensation results suggest that the influence of mainland's weak investor protection still dominates the influence of Hong Kong's strong investor protection in shaping the managerial cash compensation design in

[12] The 13% for A shares is computed as $e^{(2.274*SDroa-0.056*SDret)}-1$, where SDroa and SDret are A shares' standard deviation of ROA and RET, respectively. The 47% for H shares is computed as $e^{((2.274+1.938)*SDroa+(-0.056+0.036)*SDret)}-1$, where SDroa and SDret are H shares' standard deviation of ROA and RET, respectively. The 80% for Red Chip shares is computed in a similar fashion.

Table 2 OLS regression result of top executives' average annual cash compensation level (N = 457)

	Dependent variable = LN(CASHPAY)
H	0.325
	(0.058)*
REDCHIP	0.122
	(0.773)
ROA	2.274
	(0.041)**
ROA × H	1.938
	(0.189)
ROA × REDCHIP	2.485
	(0.074)*
RET	−0.056
	(0.748)
RET × H	0.036
	(0.873)
RET × REDCHIP	0.351
	(0.056)*
UTILITIES	0.221
	(0.270)
CONGLOMERATE	0.291
	(0.056)*
LN(ASSETS)	0.206
	(0.000)***
BM	−0.121
	(0.220)
LN(COSTOFLIVING)	0.696
	(0.000)***
LN(FIRMAGE)	−0.180
	(0.106)
ROA × UTILITIES	−2.643
	(0.156)
RET × UTILITIES	−0.221
	(0.200)
ROA × CONGLOMERATE	−6.553
	(0.000)***
RET × CONGLOMERATE	0.031
	(0.833)
ROA × LN(ASSETS)	−0.591
	(0.120)
RET × LN(ASSETS)	0.071
	(0.144)

Table 2 continued

	Dependent variable = LN(CASHPAY)
ROA × BM	−3.377
	(0.000)***
RET × BM	0.019
	(0.837)
Constant	2.104
	(0.012)**
Adjusted *R*-squared	0.489
Two-tailed p value for the null hypothesis	
ROA × H = ROA × REDCHIP	0.697
RET × H = RET × REDCHIP	0.029

See the appendix for variable definitions. LN(ASSETS) is demeaned to avoid multicollinearity. Outliers are deleted using Cook's (1977) distance statistics. Standard errors are calculated based on the method of Rogers (1993), which allows heteroskedasticity and any type of correlation for observations of the same firms but assumes independence for observations of different firms. Two-tailed *p* values are reported in parentheses. *, **, and *** Indicate a significance level of 10, 5, and 1%, respectively

state-controlled H shares but that the opposite is true in state-controlled Red Chip shares.[13]

As expected, the coefficients on LN(ASSETS) and COSTOFLIVING are significantly positive. Consistent with Smith and Watts (1992), the coefficient on ROA × BM is significantly negative. Interestingly, despite the business complexity associated with conglomerates, the pay-for-performance sensitivity (ROA × CONGLOMERATE) is weaker for conglomerates.

6.1.2 The change regression

Table 3 shows the regression result of changes in the managerial cash compensation. Because changes in UTILITIES, CONGLOMERATE, and LN(COSTOFLIVING) are always zero, they are automatically dropped from the change regression in Table 3. Consistent with the level regression result in Table 2, the coefficient on ΔROA is significantly positive. The coefficients on Δ(ROA × H) and Δ(RET × H) are still insignificant. While the coefficient on Δ(ROA × REDCHIP) becomes insignificant, the coefficient on Δ(RET × REDCHIP) is still significantly positive. In addition, the coefficient on Δ(RET × REDCHIP) is significantly larger than the coefficient on Δ(RET × H) (two-tailed $p = 0.039$), while the difference in the coefficients on Δ(ROA × H) and Δ(ROA × REDCHIP) remains insignificant. Overall, the results for the change regression are consistent with those from the level regression in Table 2.

[13] Consistent with the managerial power theory (see Finkelstein 1992; Lambert et al. 1993), we find that LN(CASHPAY) increases (decreases) with the CEO's stock ownership (the controlling shareholder's stock ownership). However, including these two control variables in model (1) does not alter our inference in Table 2.

Table 3 OLS regression result of changes in top executives' average annual cash compensation

	Dependent variable = ΔLN(CASHPAY)
H	−0.115
	(0.150)
REDCHIP	−0.189
	(0.012)**
ΔROA	1.626
	(0.094)*
Δ(ROA × H)	1.062
	(0.328)
Δ(ROA × REDCHIP)	−0.389
	(0.740)
ΔRET	−0.057
	(0.527)
Δ(RET × H)	0.184
	(0.114)
Δ(RET × REDCHIP)	0.352
	(0.002)***
ΔLN(ASSETS)	0.133
	(0.288)
ΔBM	−0.245
	(0.038)**
ΔLN(FIRMAGE)	−0.082
	(0.853)
Δ(ROA × UTILITIES)	0.692
	(0.752)
Δ(RET × UTILITIES)	−0.130
	(0.214)
Δ(ROA × CONGLOMERATE)	−1.952
	(0.417)
Δ(RET × CONGLOMERATE)	0.078
	(0.505)
Δ(ROA × LN(ASSETS))	−0.082
	(0.817)
Δ(RET × LN(ASSETS))	0.001
	(0.951)
Δ(ROA × BM)	−1.256
	(0.008)***
Δ(RET × BM)	0.020
	(0.706)
Constant	0.231
	(0.004)***
Observations	217

Table 3 continued

	Dependent variable = ΔLN(CASHPAY)
Adjusted R-squared	0.038
Two-tailed p value for the null hypothesis	
Δ(ROA × H) = Δ(ROA × REDCHIP)	0.125
Δ(RET × H) = Δ(RET × REDCHIP)	0.039

See the appendix for variable definitions. Because changes in UTILITIES, CONGLOMERATE, and LN(COSTOFLIVING) are always zero, they are automatically dropped from the change regression. LN(ASSETS) is demeaned to avoid multicollinearity. Outliers are deleted using Cook's (1977) distance statistics. Standard errors are adjusted for heteroskedasticity based on the method of Rogers (1993). Two-tailed *p* values are reported in parentheses. *, **, and *** Indicate a significance level of 10, 5, and 1%, respectively

6.2 Long-term managerial incentives

Table 4 reports the regression results of LONGTERMINCENTIVE (Probit) and EQUITYOWN (Tobit) in columns (1) and (2), respectively. As inferences are qualitatively similar using either LONGTERMINCENTIVE or EQUITYOWN, we focus on the regression result of EQUITYOWN in the following discussion.[14] Shown in column (2) of Table 4, the coefficient on H for state-controlled firms is insignificant, suggesting that there is no evidence that a Hong Kong listing significantly improves state-controlled H firms' managerial equity ownership. However, the coefficient on REDCHIP is significantly positive and larger than that on H (two-tailed $p = 0.004$). Overall, these results are consistent with the regression result of managerial cash compensation. Consistent with prior US research, value firms (BM), large firms (LNASSETS), and firms in regulated utilities industry (UTILITIES) report lower levels of managerial equity ownership.

6.3 CEO turnover

Table 5 reports the Cox hazard regression result of CEO turnover over the period of 1999 through 2004. In sharp contrast to the commonly observed negative sensitivity of CEO turnover to firm performance in US firms (for example, Weisbach 1988, Engel et al. 2003) or cross-listed firms in the US (for example, Lel and Miller 2008), we find no evidence that CEO turnover is sensitive to firm performance for any of the three types of state-controlled Chinese firms. None of the coefficients on ΔROA, RET, and their interactions with H and REDCHIP are significant. These results suggest that the appointment and termination of top managers in state-controlled Chinese firms are significantly influenced by factors other than firm performance, including, for example, Communist Party politics. The results for Red Chip shares are particularly surprising because they stand in direct contrast to the cash compensation and long-term incentive results in Tables 2, 3 and 4, suggesting that

[14] Results are similar if we exclude the CEO's stock ownership from LONGTERMINCENTIVE and EQUITYOWN, suggesting that our results are not entirely driven by managerial share ownership alone.

Table 4 Regression results of long-term managerial incentives

	(1) Dependent variable = LONGTERMINCENTIVE (Probit)	(2) Dependent variable = EQUITYOWN (Tobit)
H	0.199	0.002
	(0.415)	(0.723)
REDCHIP	2.564	0.023
	(0.000)***	(0.001)***
IDIOSYNCRATICKRISK	−0.379	−0.001
	(0.080)*	(0.869)
LN(ASSETS)	−0.001	−0.006
	(0.990)	(0.035)**
BM	−0.412	−0.007
	(0.008)***	(0.039)**
UTILITIES	−0.779	−0.012
	(0.001)***	(0.015)**
CONGLOMERATE	0.101	−0.004
	(0.752)	(0.446)
LN(FIRMAGE)	0.167	−0.001
	(0.404)	(0.849)
Constant	−1.181	−0.009
	(0.141)	(0.560)
Observations	461	461
Two-tailed p value for the null hypothesis		
H = REDCHIP	<0.001	0.004

See the appendix for variable definitions. Standard errors are calculated based on the method of Rogers (1993), which allows heteroskedasticity and any type of correlation for observations of the same firms but assumes independence for observations of different firms. Two-tailed *p* values are reported in parentheses. *, **, and *** Indicate a significance level of 10, 5, and 1%, respectively

the Chinese government has a firmer grip on the personnel decisions than other management decisions in state-controlled Red Chip shares.

6.4 Self-selection bias

Doidge et al. (2009) 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 US, a country with strong investor protection. As Hong Kong's investor protection is stronger than mainland China's, Doidge et al.'s evidence suggests that state-controlled H shares and Red Chip shares are inherently better in terms of investor protection than A shares and thus we should observe a stronger pay-for-performance sensitivity even if those firms were listed domestically. This self-selection bias may explain the stronger

Table 5 Cox hazard regression result on the sensitivity of CEO turnover to firm performance

	Regression coefficient (two-tailed p value)
H	−0.259
	(0.193)
REDCHIP	−0.199
	(0.422)
ΔROA	−2.582
	(0.480)
ΔROA × H	0.965
	(0.835)
ΔROA × REDCHIP	3.803
	(0.347)
RET	0.059
	(0.881)
RET × H	0.127
	(0.781)
RET × REDCHIP	−0.030
	(0.942)
LN(ASSETS)	0.062
	(0.398)
UTILITIES	0.378
	(0.038)**
CONGLOMERATE	0.242
	(0.359)
Year fixed effects	YES
Observations	767
Two-tailed p value for the null hypothesis	
ROA × H = ROA × REDCHIP	0.413
RET × H = RET × REDCHIP	0.551

See the appendix for variable definitions. ΔROA and RET are lagged 1 year relative to the CEO turnover year. Standard errors are calculated based on the method of Rogers (1993), which allows heteroskedasticity and any type of correlation for observations of the same firms but assumes independence for observations of different firms. *, **, and *** Indicate a significance level of 10, 5, and 1%, respectively

pay-for-performance sensitivity in state-controlled Red Chip shares but cannot explain the similarity in results between state-controlled A shares and state-controlled H shares.

We also believe that the self-selection bias should be less severe in China than in other countries. State-controlled Chinese firms' stock listing decisions are tightly controlled by the Chinese government rather than by the individual firms themselves. Hung et al. (2008) find that state-controlled Chinese firms' stock listing location choice is primarily determined by political considerations and not by firms' growth opportunities and capital needs. In fact, Hung et al. (2008) find that poorly performing Chinese firms are more likely to be pushed by the Chinese government to get listed on the Hong Kong Stock Exchange. As investor protection is believed to be positively associated with firm performance, the evidence in Hung

et al. (2008) suggests that the self selection, if it exists, may bias us against finding a positive Hong Kong listing effect.

7 Conclusion

We use three unique types of state-controlled Chinese firms (A shares, H shares, and Red Chip shares) to test the effect of listing state-controlled Chinese firms in Hong Kong, a financial market with strong investor protection, on the sensitivity of managerial compensation to firm performance. 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 long term managerial incentives (that is, shares, stock options, and other long term incentives), and (c) the sensitivity of CEO turnover to firm performance. We find no evidence that the three measures of managerial pay-for-performance sensitivity are stronger for state-controlled H shares than for state-controlled A shares. However, consistent with the bonding hypothesis, we find that the sensitivity of managerial cash compensation to firm performance and the level of long-term managerial incentives are significantly higher for state-controlled Red Chip shares than for state-controlled A shares and state-controlled H shares. Red Chip shares' results suggest that the influence of mainland's institutional forces is significantly reduced in state-controlled Red Chip shares and thus their managerial compensation is more aligned with shareholder value maximization. Interestingly, we find no evidence of a significantly negative sensitivity of CEO turnover to firm performance for all three types of state-controlled Chinese firms. This evidence suggests that state-controlled Chinese firms' managerial turnover is still tightly controlled by the Chinese government and is not sensitive to firm performance.

Our findings have important implications for regulators, investors, and researchers. Our results suggest that the bonding hypothesis developed in the US does not uniformly apply to all overseas listed state-controlled Chinese firms and to all dimensions of the managerial pay-for-performance sensitivity. Our results are also relevant to investors and regulators in mainland China. In early 2006 the China Securities Regulatory Commission (CSRC) issued rules that would allow A shares and H shares to use stock option-type equity compensation. As mainland China's investor protection continues to be low, our results raise the doubt that the CSRC rule will significantly increase state-controlled A shares and H shares' managerial pay-for-performance sensitivity. The new stock option plans proposed by several large state-controlled Chinese A shares are consistent with our conjecture (for example, Yam 2006, Fairclough 2007).

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Appendix-Variable definitions

H	a dummy variable that equals one for H shares and zero otherwise
REDCHIP	a dummy variable that equals one for Red Chip shares and zero otherwise
CASHPAY	the average annual cash compensation (including cash bonus) in year t for the top executives (the top three for A shares and the top five for H/Red Chip shares)
ΔLN(CASHPAY)	the annual difference of LN(CASHPAY)
ROA	operating income in year t divided by the average total assets at the beginning and end of year t
RET	the fiscal year total return minus the market index return in year t. Market return is the Hang Seng index return for H and Red Chip shares and the Shanghai and Shenzhen composite index return for A shares
UTILITIES	a dummy variable that equals one for firms in the utilities industry and zero otherwise
CONGLOMERATE	a dummy variable that equals one for conglomerates and zero otherwise
ASSETS	total assets at the end of year t in millions of RMB
BM	the ratio of book value of equity to the total market cap of the listed firm at the beginning of year t
COSTOFLIVING	the cost of living in the listed firm's headquarters (in millions of RMB) measured in calendar year 2003
FIRMAGE	the number of years as of year t since the firm's IPO
LONGTERMINCENTIVE	a dummy variable that equals one if a firm has any kind of long term incentive plans for its CEO or board chairman (for example, stocks, stock options, share appreciation rights, phantom stocks, or any other forms of long term incentive plans) in year t and zero otherwise
EQUITYOWN	the stock and stock option ownership by the board chairman of the listed firm in year t
IDIOSYNCRATICRISK	the natural logarithm of the standard deviation of the residuals from a 36-month market model regression as of the beginning of year t. For firms that do not have

	36 months of returns, we require a minimum of 12 months of returns
PARENT_OWN	the stock ownership of the largest shareholder in the listed firm at the end of year t
ΔROA	the annual change in total operating income in year t scaled by the average total assets at the beginning and end of year t

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