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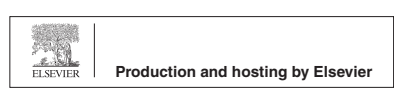

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The role of cross-listing, foreign ownership and state ownership in dividend policy in an emerging market

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ABSTRACT

In this paper, we investigate if dividend policy is influenced by ownership type. Within the dividend literature, dividends have a signaling role regarding agency costs, such that dividends may diminish insider conflicts (reduce free cash flow) or may be used to extract cash from firms (tunneling effect) – which could be predominant in emerging markets. We expect firms with foreign ownership and those that are listed in overseas markets to have different dividend policies and practices than those that are not, and firms with more state ownership and less individual ownership to be more likely to pay cash dividends and less likely to pay stock dividends. Using firms from an emerging economy (China), we examine whether these effects exist in corporate dividend policy and practice. We find that both foreign ownership and cross-listing have significant negative effects on cash dividends, consistent with the signaling effect and the notion of reduced tunneling activities for firms with the ability to raise capital from outside of China. Consistent with the tunneling effect, we find that firms with higher state ownership tend to pay higher cash dividends and lower stock dividends, while the opposite is true for public (individual) ownership. Further analysis shows that foreign ownership mediates the effect of state ownership on dividend policy. Our results have significant implications for researchers, investors, policy makers and regulators in emerging markets.

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1. Introduction

Corporate dividend policy has attracted the interest of researchers of capital markets and corporate behavior for almost half a century. Today, corporate governance and ownership structure issues continue to be of major interest to researchers, practitioners and policy makers, in particular following accounting scandals such as Enron and WorldCom in 2002 and the corresponding legislative reforms such as the Sarbanes–Oxley Act in the United States. Empirical research on corporate governance is based on the theoretical framework of agency theory (e.g., Jensen and Meckling, 1976; Fama and Jensen, 1983), which provides a framework to explain how to create an effective monitoring and incentive scheme under uncertainty and incomplete information. Following this line of research, the literature has argued that dividends can be used to prevent insiders from diverting retained earnings for their own benefit. In countries with strong investor protection, dividends are found to play a useful role in reducing agency problems, whereas they play a less important role in countries with weak investor protection (La Porta et al., 2000). China is a civil law country with weak investor protection and according to the La Porta et al. (2000) model, lower dividend payout ratios are expected. However, along with dynamic changes, extremely high payout ratios have been observed in China (Chen et al., 2009). In this paper, we shed light on such a dilemma by focusing on whether corporate ownership structure has an influence on corporate dividend policies.

Corporate ownership structure could be associated with dividend policy and practice in that dividends signal the extent of conflicts between majority shareholders and minority shareholders (e.g. Jensen et al., 1992). While empirical studies have documented the significant role of ownership variables in determining dividend policies (Thomsen, 2005; Mancinelli and Ozkan, 2006; Khan, 2006; Szilagyi and Renneboog, 2007), the results are quite mixed. For instance, Szilagyi and Renneboog (2007) find a positive relationship between stakeholders' ownership and dividends for Dutch firms, while Thomsen (2005) and Khan (2006) find a negative relationship for UK firms.

In addition, the potential impact of foreign stockholder ownership has been largely neglected, especially in emerging markets where the ownership structures and institutional background are significantly different from those of developed economies. In a recent study, Ferguson et al. (2002) show that the disclosure policies and disclosure behavior of Chinese firms issuing cross-listed shares on the Stock Exchange of Hong Kong (H-shares on SEHK) were very different from other SEHK-listed firms and state-owned firms incorporated in Hong Kong (Red-chip shares), which they attribute to signaling incentives and cost-benefit concerns. Such differences might also exist for dividend policies and practices. If dividends play a signaling role, then the fact that firms are listed overseas may have a significant influence on their dividend policies and practices compared to those that are not. Therefore, in an emerging market setting, we investigate whether there are significant differences in dividend policies and practices between firms with cross-listed shares and/or foreign ownership and those without.

Other motivations of our study come from the unique institutional setting of public firms in China. The literature has documented several possible motivations for public firms to pay dividends, such as to signal firms' future prospects to investors (e.g., Bhattacharya, 1979; John and Williams, 1985), restrain agency problems by forcing firms to external capital markets with additional monitoring (Rozeff, 1982; Easterbrook, 1984), reduce management's opportunity to invest the firm's free cash flow in projects that benefit management at shareholders' expense (Jensen, 1986) or projects that benefit controlling shareholders at minority shareholders' expense (Faccio et al., 2001) and to minimize taxes (Wilkinson et al., 2001).

However, in contrast to the earlier hypothesis that dividend payments are a vehicle to constrain the agency behavior of managers (e.g., Jensen, 1986), cash dividends are preferred by majority shareholders in emerging markets (Chen et al., 2009). This may occur because the firms listed in emerging markets are mostly equity carve-outs, a term used to indicate that these firms were originally part of assets or subsidiaries of state-owned enterprises and were chosen to be listed because they were relatively attractive to investors. Earlier literature has documented that Chinese firms with a controlling state shareholder are more likely to pay cash dividends and state shareholders are more likely to surrender the exercise of stock subscription rights (Wei et al., 2004).[1]

[1] Rights offerings are the offering to existing shareholders of rights to subscribe to common stocks.

Such dividend practices are similar to transferring state shares to other minority shareholders at a transfer price higher than a price under private placement (Lee and Xiao, 2004).[2]

In contrast, stock dividends can play a different role from cash dividends in the emerging market of China. First, firms with better prospects are more capable of signaling through stock dividend distribution, which is the only available signaling alternative as stock splits are not allowed in China. Second, stock dividend distributions restrict a firm's ability to pay cash dividends in the future, indicating that stock dividends are less likely to be used by state shareholders as such dividends limit their ability to obtain cash from listed companies in the future. Furthermore, stock dividend distribution can increase the share's liquidity and its attractiveness to investors (Lakonishok and Lev, 1987).

In summary, cash dividends and stock dividends play different roles in China. Cash dividends, coupled with non-subscription of shares in subsequent rights offers, represent the return of cash to controlling shareholders and such behavior is termed 'tunneling' in the recent literature. Stock dividends, without entailing actual cash outflow, cannot play such a tunneling role but can be used as a credible mechanism to convey insider information to investors. China provides a unique setting for researchers to study the difference between cash dividends and stock dividends and their determinants.

Both the policies and practices related to cash dividends and stock dividends are examined in our paper to obtain a sufficient understanding of their roles and relationships with corporate ownership structure in the emerging market of China. In addition, along with the roles of cross-listings and foreign ownership in influencing dividend policy, which have not been examined and are one of the aims of our paper, we also investigate the effects of state-ownership and individual ownership on dividends to obtain a comprehensive understanding of the different roles of various shareholders in the same setting. Finally, we control for other factors that are considered as determinants of dividends in the literature. These factors include firm size, leverage, risk, growth opportunity, free cash flow and profitability (Alpa, 2005; Goergen et al., 2005).

We find that firms with higher foreign ownership and cross-listed firms are less likely to distribute cash dividends, which are consistent with the notion of reduced tunneling activities for firms with the ability to raise capital outside of China. We also find that firms with higher state ownership tend to pay higher cash dividends and lower stock dividends, indicating that the tunneling effect dominates the signaling effect for firms with higher state ownership. Furthermore, firms with higher individual ownership tend to pay higher stock dividends and lower cash dividends, where the signaling effect dominates.

Our paper adds to the literature by exploring the role of cross-listing and foreign ownership in determining dividend policy. In particular, we extend the current literature by examining whether companies issuing B-shares, H-shares (in Hong Kong) or cross listed in the US or other markets follow a different policy than documented in early studies on firms issuing only domestic shares (e.g., Wei et al., 2004).

In addition, our study provides updated research on the relationship between corporate ownership structure and dividends. In light of the changes in regulation and ownership, we find a trend toward less cash dividends and more stock dividends during our sample period, which is in contrast to the trend toward more cash dividends and less stock dividends found by earlier studies, such as Wei et al. (2004) with a sample period from 1995 to 2000.

Finally, our paper contributes to the understanding of whether and how majority shareholders use dividend policies to facilitate tunneling cash to themselves. For instance, the role of state shareholders in the unique setting of the emerging market of China can help us obtain a better understanding of the role of government ownership in business.

The paper is organized as follows. Section 2 discusses the regulatory requirements of dividend policy in China, including the types of dividends and the institutional setting relevant to dividend policies. The literature review and hypothesis development are included in Section 3. Section 4 discusses the sample, variables and empirical method used in examining the association between dividend policy and corporate ownership

[2] State shares were typically non-tradable during the period of our study. They could only be bought and sold through private placement with special approval from the government. However, as discussed later in the paper, in 2005, the Chinese government launched a reform on split share structure by converting non-tradable shares (state and legal person shares) into tradable shares. Nonetheless, it has been argued that the change has only been superficial and the shares, even after the conversion, are "de facto non-tradable shares" (Cheng et al., 2009). Moreover, the dates that these shares can be converted occur after 2006, which is outside the period of our study. Note 8 below also reports the results from sensitivity tests to examine the conversion effect on our analysis.

structure. Section 5 provides the results of our empirical analysis. Finally, Section 6 presents the conclusions and implications.

2. Regulatory requirements of dividend policy in China

2.1. Dividend policy in China

Three general forms of dividend policies are used in public firms in China: cash dividends, stock dividends and a combination of the two (Milonas et al., 2006). There is no mandatory dividend rule that requires a certain percentage of net income or retained earnings to be paid out as dividends and listed companies are allowed to make their own dividend policies (Wei et al., 2004). However, when the board of directors of a firm proposes a distribution of dividends, the proposed dividend policy is subject to final approval at the shareholders' meeting (Milonas et al., 2006). Moreover, the details are required to be announced in designated newspapers along with the interim or annual report. In particular, listed firms should explicitly show the source of dividends in their annual report (Wei et al., 2004).[3]

The dividend policies of listed companies have experienced significant changes since the establishment of stock markets in China. In the early stage of the stock markets, firms tended to distribute stock dividends rather than cash dividends. For instance, in 1992, about 96.23% of firms distributing dividends paid stock dividends, while in 2000 only 11.25% paid stock dividends (Wei et al., 2004). The same study reported that on average, 53.5% of firms distributed cash dividends from 1992 to 2001. Table 1 provides information using more recent data. The percentage of firms paying only cash dividends fell from 51.91% in 2001 to 38.02% in 2006, while firms paying only stock dividends ranged from 4.91% in 2001 to 9.76% in 2006 with fluctuations in between. Firms distributing both cash and stock dividends ranged from 7.72% to 13.94% during the same period. Non-dividend payers rose from 31% in 2001 to 40.67% in 2006. Thus, our results show an inverse trend when compared to the 1995–2000 results of Wei et al. (2004). Fewer firms paid cash dividends over the period of 2001–2006 than the previous period, which warrants investigation to shed light on this shift in dividend policies.

2.2. Institutional factors that affect dividend policy

There are a few institutional features that affect dividend policies. First, state shareholders seem to play a dominant role in determining dividend policies. Most of the listed companies in China are state-owned and the government has enormous discretion on dividend policy (Wei et al., 2004). Although the number of privately-owned listed companies has increased over time, most listed companies are still controlled by state shareholders. Table 2 illustrates the ownership situation of listed firms in China from 2001 to 2006. For non-tradable shares, state ownership declined from 40.8% in 2001 to 28.8% in 2006. Management ownership (inside employee ownership) decreased from 0.71% in 2001 to 0.1% in 2006. Institutional ownership changed from 18.29% in 2001 to 19% in 2006.[4] For tradable shares, public ownership increased from 35.95% in 2001 to 45.88% in 2006. Foreign ownership (combination of B-shares and H-shares) decreased slightly from 3.06% in 2001 to 2.71% in 2006.

Second, the role of minority shareholders in corporate governance is limited in China (Jiang et al., 2010). The Chinese legal system offers few options for minority shareholders to take private enforcement against misconduct by large shareholders. The authority of regulators to enforce punitive action is also restricted. In addition, as institutional investors, such as mutual funds, are at a primitive stage in this emerging market, it is more difficult for a fund to influence corporate governance compared to its counterparts in the United States.

[3] The source of stock dividends can be from capital reserves, surplus reserves and/or undistributed profits. Capital surplus refers to capital accumulation due to the increase of net assets resulting from non-operating activities, such as premium on paid in capital, receipt of donations, government appropriations and foreign currency translation difference. Surplus reserve refers to the reserves setup from profits annually in accordance with government regulations. Article 177 of the Chinese Company Law requires an amount of 10% of after-tax profits to be provided annually to the surplus reserve.

[4] As also suggested in Note 2 above, the figures should be interpreted within the context of the 2005 share structure reform launched by the China Securities Regulatory Commission (CSRC, 2005).

Table 1
Number and percentage of China listed firms with cash and/or stock dividends. This table reports the number and percentage of firms paying no dividends and those of firms paying cash (stock) dividends from 2001 to 2006. In China some firms pay stock dividends and cash dividends at the same time, some pay only stock dividends or only cash dividends, and others pay no dividends.

	2001	2002	2003	2004	2005	2006
Firms paying only cash dividends						
Number of firms	571	519	513	554	507	530
Percentage of all listed firms (%)	51.91	45.41	42.12	41.75	37.78	38.02
Firms paying only stock dividends						
Number of firms	54	55	55	55	50	136
Percentage of all listed firms (%)	4.91	4.81	4.52	4.14	3.73	9.76
Firms paying both stock and cash dividends						
Number of firms	134	95	94	185	134	161
Percentage of all listed firms (%)	12.18	8.31	7.72	13.94	9.99	11.55
Non-dividend payers						
Number of firms paying neither cash nor stock dividends	341	474	556	533	651	567
Percentage of all listed firms (%)	31.00	41.47	45.65	40.17	48.51	40.67
All listed firms	1100	1143	1218	1327	1342	1394

Table 2
Average ownership structure of listed companies from 2001 to 2006 (%). This table reports descriptive statistics of the ownership structure of listed firms in China. Source: TEJ database.

	2001 (%)	2002 (%)	2003 (%)	2004 (%)	2005 (%)	2006 (%)
Non-tradable shares						
State-owned shares	40.81	40.46	38.50	35.90	34.18	28.75
Inside employee shares	0.71	0.44	0.20	0.18	0.12	0.10
Domestic institutional shares	11.36	11.34	12.71	14.48	14.83	16.03
Placement institutional shares	6.93	6.83	6.88	6.64	6.06	2.96
Other shares	0.13	0.37	0.82	1.92	1.74	2.18
Foreign institutional shares	1.05	1.01	1.18	1.30	1.40	1.39
Subtotal	60.99	60.45	60.29	60.42	58.33	51.41
Tradable shares						
Public individual shares	35.95	36.49	36.79	36.85	38.88	45.88
Foreign within China shares (B-shares)	2.39	2.30	2.15	2.01	2.05	1.92
Foreign outside China shares (H-shares)	0.67	0.76	0.77	0.72	0.74	0.79
Subtotal	39.01	39.55	39.71	39.58	41.67	48.59
Total	100.00	100.00	100.00	100.00	100.00	100.00
Of the above						
Total foreign shares	4.11	4.07	4.10%	4.03	4.19	4.10
Total institutional shares	18.29	18.17	19.59	21.12	20.89	18.99
Average ownership by top 10 shareholders	61.50	61.95	61.31%	61.91	60.60	56.36

The average ownership by all mutual funds was only 3.75% of total shares outstanding in 2004 (Jiang et al., 2010). Hence, it is more difficult for a fund to influence corporate governance compared to its counterparts in the US.

Finally, controlling shareholders of public firms seem to prefer cash dividends to stock dividends in China, where most firms are carved out from state-owned enterprises (SOEs). As the government restrictively regulates both IPOs and seasoned equity financing, many firms and their holding companies are short of working capital. Moreover, state shares are not tradable in the market (Sami and Zhou, 2004). In such a setting, controlling shareholders, particularly in SOEs, may force listed firms to pay cash dividends to fulfill their capital needs (Lee and Xiao, 2004).

In addition to the approval from the shareholders' general meeting (GTA, 2010), public companies must meet the following requirements[5] in order to distribute stock dividends: (1) they must have recovered any prior losses (if any), (2) the amount can be distributed only if there is a sufficient balance for the appropriation of the statutory surplus reserve, including that related to the public welfare fund, (3) the statutory surplus reserve and capital reserve, after the distribution, must not be less than 50% of the capital stock account balance, and (4) the stock dividend must be offered to all registered common stockholders. As a result, stock dividend distribution is not only limited to profitable companies it is also limited in its scale.

The accounting treatment for stock dividends also affects the popularity of stock dividends. Stock dividends are accounted for in China by reclassifying the appropriate undistributed and reserve accounts to the capital stock account based on the par value of the stock dividends issued (Lan, 2001, pages 11–13). This is different from the prevailing practices in other countries (such as the US) where the transfer is based on the fair value of the stock dividends issued (Kieso et al., 2007, pages 745–746). The fact that the par value is usually lower than its fair value explains why stock dividends are more prevalent in China than in the US.

3. Literature review and hypothesis development

3.1. Determinants of dividend payout policy

The literature on dividend policy provides three schools of theoretical models to explain corporate dividend behavior. The first group of theories (full information models) argues that investors demand higher expected returns on shares of dividend-paying stocks as a result of the imposition of a tax liability on dividends (Miller and Scholes, 1978; DeAngelo and Masulis, 1980). The second group of theories (information asymmetry models) is based on the market inefficiency hypothesis related to asymmetric information (Kale and Noe, 1990; John and Kalay, 1982; Jensen, 1986). The third group of theories (behavioral models) suggests that investor behavior is substantially influenced by societal norms and attitudes (Shiller, 1984) and dividend payouts can be viewed as the socioeconomic effect of corporate evolution (Frankfurter and Lane, 1992).

First, the literature has documented that tax factors affect the demand from investors to increase shareholders' pre-tax returns (Miller and Scholes, 1978; DeAngelo and Masulis, 1980). This suggests a negative relationship between tax rates and dividend payouts. However, a survey on the management of US companies indicates that differential taxes were a consideration, but not a first-order concern in payout policy decisions (Brav et al., 2005). Their results suggest that the factors discussed below could be more important in a low dividend tax environment.

Second, the literature also provides models based on the market inefficiency hypothesis related to asymmetric information, such as dividend signaling models (Kale and Noe, 1990). This is consistent with agency theory, which uses dividend policy to align the interests of shareholders and corporate managers (John and Kalay, 1982). Many researchers believe that dividends can convey information about a firm's prospects. One possibility is that dividends could simply convey information not previously known to the market (Miller and Rock, 1985), even if managers are not explicitly signaling private information. Alternatively, dividends can be used explicitly as an expensive signal to alter market perceptions of future earnings prospects (e.g., Bhattacharya, 1979; John and Williams, 1985). This line of literature has consistent findings that firms' hesitancy to cut dividends is related to signaling. The reason is that the market perceives that only firms with long-run and severe liquidity crises make dividends cut, and firms normally do not want to give the market such an impression. It would be extremely costly for bad firms to mimic good firms' policy of not cutting dividends. Therefore, by not cutting its dividend, a good firm might be able to separate itself from bad competitors (Brav et al., 2005).

Third, the dividend literature has also developed clientele theory, which suggests that investor behavior is substantially influenced by societal norms and attitudes (Shiller, 1984) and dividend payouts can be viewed as the socioeconomic effect of corporate evolution. That is, the segregation of management and ownership makes

[5] The requirements are based on the Provisional Regulations on the Administration of Stock Issuance and Trading (see GTA 2010, page 11). Further to Note 3 above, the public welfare fund is part of the surplus reserve which is designed to be used for expenditure relating to employees' welfare (Chong and Wang, 2004).

it necessary to use dividend payouts to increase the attractiveness of equity issues. Even with the large tax disadvantage of dividends, paying dividends is an important factor in attracting individual investors to own shares (Brav et al., 2005). From management's perspective, institutions attempt to influence dividend decisions as much as they try to influence repurchase decisions. However, there are mixed results as to whether dividend payments are a significant factor affecting institutions' decisions (e.g., Allen et al., 2000; Brav et al., 2005).

Corporate ownership structure could be associated with dividend policy and practice in that dividends signal the extent of conflicts between majority shareholders and minority shareholders (Jensen et al., 1992). While empirical studies have investigated the significant role of different ownership variables in determining dividend policies (Thomsen, 2005; Khan, 2006; Szilagyi and Renneboog, 2007, among others), the results are quite mixed. For instance, Szilagyi and Renneboog (2007) find a positive relationship between stakeholders' ownership and dividends for Dutch firms, while Thomsen (2005) and Khan (2006) find a negative relationship for UK firms. We attempt to shed more light on such issues using data from the emerging market of China.

3.2. Studies on dividend payout in china and hypothesis development

The dividend literature usually suggests that paying cash dividends mitigates the conflict of interest between majority shareholders and minority shareholders (e.g., Faccio et al., 2001). However, recent studies in China provide the opposite evidence. For instance, Wei et al. (2004) analyze the effects of state and individual shareholders on dividend policy, and find a positive relationship between state ownership and cash dividends and between individual ownership and stock dividends. Moreover, the higher the state ownership, the higher the cash dividend rate. Similarly, Lee and Xiao (2004) find that firms with higher state ownership in China are more likely to pay cash dividends, increase cash dividends subsequent to rights offerings and give up stock subscription rights. As state shares in China can only be transferred with special approval by the government, this dividend practice has the same effect as the state's transfer of a portion of non-tradable shares to other shareholders. In addition, Lee and Xiao (2004) find that the computed transfer price is about three times higher than that of a typical private placement officially approved by the government. The capital market reacts negatively to the cash dividend announcements of state controlling firms but positively to those of other firms, suggesting that instead of alleviating agency problems, cash dividends might be used as a vehicle for tunneling in firms with the state as the controlling shareholder.

There are several reasons proposed in the literature suggesting stock dividends can play a different role than cash dividends in China. First, as argued by the traditional signaling theory, managers of public firms can use stock dividends to signal favorable insider information to the market (Grinblatt et al., 1984). Firms with better prospects are more capable of signaling because the reduction in the balance of retained earnings resulting from stock dividend distributions will constrain their future cash dividend payments. However, firms with poorer prospects find it more difficult to mimic this behavior as their undistributed profits cannot be replenished so easily. Although stock splits are as credible a signal as stock dividends, they are prohibited in China (Wei and Xiao, 2009). Thus, stock dividends are the only available signaling alternative. Second, stock dividend distribution restricts a firm's ability to pay cash dividends in the future, indicating that stock dividends are less likely to be used to tunnel cash to majority shareholders in the future. Third, as the demand for equity shares in China is strong due to the lack of other investment opportunities (Chen and Yuan, 2004), stock dividend distribution can increase the share's liquidity and its attractiveness to investors (Lakonishok and Lev, 1987). Fourth, Chinese companies could raise more capital by paying stock dividends than paying cash dividends before a rights issue (Wei and Xiao, 2009). Under the rules of the China Securities Regulatory Commission, the price used for rights issues should be based on the average share price during the period of twenty days prior to the disclosure of the prospectus. As stock dividend declaration often increases stock prices while cash dividends often decrease stock prices, stock dividends can increase the money raised in a subsequent rights issue.

In sum, cash dividends and stock dividends play different roles in China. Cash dividends, coupled with non-subscription of shares in subsequent rights offerings, represent the return of cash to controlling shareholders and such behavior is termed "tunneling" in the recent literature. Stock dividends, without entailing actual cash outflow, cannot play such a tunneling role but can be used as a credible mechanism to convey insider information to investors.

Extant empirical evidence is consistent with the argument above. Chen et al. (2002) document that when earnings surprise is corroborated by a stock dividend surprise of the same directional sign, the earnings signal is stronger. Chen et al. (2002) also find that changes in cash dividends have little incremental information value. Cheng et al. (2006) conduct event studies on Chinese firms' announcements of stock dividends and cash dividends. Their results indicate that cash dividends are preferred by non-tradable shareholders while stock dividends are preferred by individual investors. They also find that stock dividends are positively related to earnings and return on assets, supporting the signaling hypothesis of dividend policy. In a more recent paper, Cheng et al. (2007) examine dividend policies of underperforming firms in China and Hong Kong. They find that poor performing Chinese firms with higher non-tradable shares pay out more cash dividends than those with a lower proportion of non-tradable shares.

Hence, the literature generally supports the two distinct roles played by cash and stock dividends in China. However, none of these studies have investigated whether firms with cross-listed shares and/or foreign ownership use different dividend policies than other firms or how foreign ownership and cross-listing act as moderating factors for different types of dividends.

As indicated in the dividend literature, dividends play a signaling role. The fact that firms are listed overseas could make a significant difference in these firms' dividend policies and practices compared to those that are not. For instance, cross-listing in the U.S. allows "good" firms to separate themselves from "bad" firms because disclosure requirements and legal liability makes cross-listing much more costly for "bad" firms (Fuerst, 1998). In addition, given that foreign investors are at an informational disadvantage in obtaining information about a local firm's future prospects compared with domestic investors (Choe et al., 2005), an increase in foreign ownership may lead to increased demand and pressure for increased disclosure by local firms. For instance, Sami and Zhou (2004) find that the value relevance of accounting information in the B-share market of China (where foreigners invest) is generally higher than in the A-share market (where domestic investors trade). A-shares' accounting information is prepared and audited for domestic investors under the domestic accounting standards, while B-shares' information is prepared and audited for foreign investors under international accounting standards. Their results suggest that the presence of foreign ownership may help to improve the general information environment of public companies. Similarly, an increase in foreign ownership may lead to increased demand and pressure for improved corporate governance. Not surprisingly, foreign investors are shown to contribute to firm performance through shareholder activism and board representation (Choi et al., 2007). Thus we would expect that the presence of foreign investors would deter the tunneling behavior of state shareholders and that foreign ownership would be negatively associated with cash dividends and positively associated with stock dividends. This is consistent with the signaling hypothesis of dividends in that the managers of public firms with foreign investors and cross-listings would have different dividends policies than those without. Finally, foreign investors tend to prefer firms with more investment opportunities. Hence, they might be more likely to prefer stock dividends to cash dividends (Lin and Schiu, 2003).

Based upon the discussions above, we develop the following hypotheses for our study:Hypothesis on cross-listing and dividends:

Hypothesis 1. Firms with cross-listed shares are more likely to pay stock dividends and less likely to pay cash dividends.

Hypothesis on foreign ownership and dividends:

Hypothesis 2. Firms with foreign ownership are more likely to pay stock dividends and less likely to pay cash dividends.

In addition, the literature above indicates that cash dividends could be used by majority shareholders as a tunneling tool, which could be predominant in emerging markets (e.g., Lee and Xiao, 2004; Cheng et al., 2006). If firms have controlling state shareholders, they are more likely to pay cash dividends and increase cash dividend payments soon after rights offerings to transfer more cash to state controlling shareholders. Cash dividends are paid to a government agent, the State-owned Asset Management Office, which supervises the state

shares and collects cash dividends on behalf of the government. As state-held shares in China can only be transferred with special approval by the government, giving up stock subscription rights and using receipts from rights offerings to pay cash dividends are similar to the transfer of non-tradable shares from majority shareholders to minority shareholders, with a computed sale price higher than that of officially approved private placements (Lee and Xiao, 2004). Thus, state shareholders would be more likely to use cash dividends as a vehicle of tunneling in firms with higher state ownership. As the privatization of state-owned enterprises simultaneously involves a reduction in state-ownership and an increase in individual (public) ownership, we also expect an opposite effect of individual ownership on dividend policy to that of state ownership. In other words, firms with more individual (public) ownership are less likely to pay cash dividends and more likely to pay stock dividends.

We retest the hypotheses on the relationship between state and individual ownership and dividend policy as the literature has documented an obvious trend that more and more firms are paying cash dividends instead of stock dividends (Wei et al., 2004). In light of the change in the trend regarding stock dividends versus cash dividends, we examine whether the findings of early studies, such as Wei et al. (2004) and Lee and Xiao (2004) on state and/or individual ownership and dividends, still apply to more recent years or not. Thus, we test the following hypotheses.Hypothesis on state ownership and dividends:

Hypothesis 3. Firms with more state ownership are more likely to pay cash dividends and less likely to pay stock dividends.

Hypothesis on individual (public) ownership and dividends:

Hypothesis 4. Firms with more individual ownership are less likely to pay cash dividends and more likely to pay stock dividends.

4. Research design

4.1. Sample selection

In this paper, we examine the dividend policies of publicly traded firms in China during the period 2001–2006. Sample selection started with the entire population of firms issuing A-shares and/or B-shares that are listed on the Shanghai Stock Exchange or Shenzhen Stock Exchange, as well as firms issuing H-shares on the Stock Exchange of Hong Kong and those firms that are cross-listed in the US and/or other foreign markets. The sample companies are selected on the basis of the following screening criteria: (1) Firms have been listed on the exchanges for at least a year before dividend announcements to exclude the effects of new listings, (2) Financial and insurance firms are excluded due to their different operations from other firms, (3) Firms that experience reorganizations during the sample period are excluded as the ownership and corporate governance of these firms could experience great changes, and so could their performance. The screening procedures result in 7519 firm-year observations from 1712 companies, of which 908 companies are listed on the Shanghai Stock Exchange and 804 on Shenzhen Stock Exchange. Among these 1712 companies, 33 firms are cross-listed on the Stock Exchange of Hong Kong, 27 in the United States, 5 in London and 1 in Singapore.

4.2. Models of dividend policy

As mentioned earlier, the literature has documented three schools of dividend policy theories to explain the determinants of corporate dividend behavior – (1) full information models, (2) models of information asymmetry and (3) behavioral models. Although these models have conflicting predictions on the effect of dividend policy on share returns, they provide a theoretical background for the determinants of dividend policies. Hence, a theoretical function of the determinants of corporate dividend policy is:

$$\text{Dividends} = f\ (\text{tax factor, information asymmetry, agency costs, socioeconomic factors, cash flow})$$

The tax factor might not play a role in dividend payouts in China. Under the current Chinese tax system, cash dividend income is exempt from tax if the cash dividend income is less than the one-year saving deposit rate declared by China's central bank. If the cash dividend income is higher than the above-mentioned amount, a flat tax rate of 20% is charged on the excess amount. For stock dividends, since the gains on the stock dividends are not realized, there is no tax effect. Dividend yields of Chinese firms are generally lower than the declared saving rates which are around two to ten percent during the past decade (Cheng et al., 2009). As our study uses data from a single country and a period with no significant changes in tax policies, we exclude the tax factor from our model. The literature shows that firm's ownership structure, firm size, firm debt, specific risk (beta) and investment opportunities (firm growth) could affect information asymmetry risk and agency costs (e.g., Choi et al., 2009). Industry features, time trend and previous dividend payout record could form the socioeconomic factors of dividend policy (Faccio et al., 2001; Wei et al., 2004). For instance, a firms' past dividend policy determines its current clientele of investors and clientele effects impede changing policy, which is consistent with the socio-economic view of dividend policy (Shiller, 1984). Performance and the level of cash in the firm could affect cash flow and in turn dividend policy. Accordingly, we examine the following dividend policy model:

$$\begin{aligned} \mathrm{CDPR_i(SDPR_i)} = {} & \alpha_0 + \alpha_1 \mathrm{CROSSLIST}i + \alpha_2 \mathrm{FOREIGN_i} + \alpha_3 \mathrm{STATE_i} + \alpha_4 \mathrm{PUBLIC_i} + \alpha_5 \mathrm{SIZE_i} \\ & + \alpha_6 \mathrm{DEBT_i} + \alpha_7 \mathrm{BETA_i} + \alpha_8 \mathrm{GROW_i} + \alpha_9 \mathrm{CASH_i} + \alpha_{10} \mathrm{ROAi} \\ & + \alpha_{11} \mathrm{LAGCDPR_i(LAGSDPR_i)} + \alpha_{12+j} \Sigma \mathrm{INDUSTRY_j} + \alpha_{13+j+k} \Sigma \mathrm{YEAR_k} + \mathrm{e_i} \end{aligned} \quad (1)$$

where CDPR = cash dividend payout ratio, calculated as cash dividends per share divided by earnings per share; SDPR = stock dividend payout ratio, calculated as stock dividends per share divided by earnings per share; CROSSLIST = 1 if the firm is cross-listed in Hong Kong, U.S., U.K. or Singapore, and 0 otherwise. FOREIGN = the percentage of equity shares owned by foreign shareholders at the fiscal year end; STATE = the percentage of equity shares owned by the government and its fully owned enterprises at the fiscal year end; PUBLIC = the percentage of equity shares owned by public (individual) shareholders; SIZE = the logarithm of book value of total assets at the fiscal year end; DEBT = the ratio of total liabilities to total assets at the fiscal year end; BETA = a firm's specific risk, estimated from a regression of share returns on market returns during the fiscal year; GROW = a firm's market to book (M/B) ratio at fiscal year end as the proxy for growth and investment opportunities; CASH = the logarithm of the total cash balance at the fiscal year end; ROA = a firm's return on assets for the fiscal year; LAGCDPR = cash dividend payout ratio in the previous fiscal year; LAGSDPR = stock dividend payout ratio in the previous fiscal year;INDUSTRY = indicator variables for industries; YEAR = indicator variables controlling for year effects; e = the error term.

The regression analysis is conducted as follows. First, we conduct a series of OLS and Tobit regressions using panel data. Furthermore, to mitigate the effects of outliers, we winsorize variables involving ratio calculations to their 1st and 99th percentile values. We also report the results of sensitivity analysis.

5. Empirical results

5.1. Univariate tests

Table 3 reports descriptive statistics for the variables in Model (1). Columns two through six report the statistics for the overall sample. The following two columns show information on firms paying zero and non-zero cash dividends, respectively. The last two columns provide information on firms paying zero and non-zero stock dividends, respectively. Details of statistical significance are also provided. The results show that on average firms with positive cash dividends have higher state ownership, lower individual (public) ownership, lower market to book ratios (GROW), higher cash balances, larger asset bases (SIZE), higher debt, higher ROA, higher possibility of being cross-listed and higher lagged cash dividends than firms paying no cash dividends. On the other hand, firms distributing stock dividends on average have lower foreign ownership, lower state ownership, and higher public ownership. They are also larger, have higher debt, lower risk (BETA), higher market to book ratios (GROW), higher cash balances, higher

Table 3
Descriptive statistics. CDPR = Cash dividends payout ratio, calculated as cash dividend per share paid in a year divided by earnings per share; SDPR = Stock dividend rate, calculated as stock dividend per share distributed in a year divided by earnings per share; FOREIGN = the percentage of equity shares owned by foreign shareholders; CROSSLIST = 1 for firms cross-listed in stock exchanges outside mainland China and 0 otherwise. STATE = the percentage of equity shares owned by the government; PUBLIC = percentage of shares owned by the general public; SIZE = log10(total assets), DEBT = total liabilities to total assets ratio; BETA = estimate of beta of the firm; GROW = market to book ratio; CASH = log10(Cash balance); ROA = return on assets. LAGCDPR and LAGSDPR are lagged (one year) measures of cash and stock dividends, respectively. *T*-tests values are computed assuming unequal variances. ***, ** and * represent significance at 0.01, 0.05 and 0.10 levels respectively.

Variables	Overall					Cash dividend		Stock dividend	
	$N = 7519$					=0 $N = 3523$	>0 $N = 3996$	=0 $N = 6391$	>0 $N = 1128$
	Mean	Median	Std. dev.	Min.	Max.	Mean	Mean	Mean	Mean
CDPR	0.28	0.13	0.37	0.00	2.44	0.00	0.52***	0.27	0.29
SDPR	0.45	0.00	1.63	0.00	11.40	0.47	0.44	0.00	3.01***
FOREIGN	4.08	0.00	11.01	0.00	92.52	4.09	4.08	4.31	2.91***
CROSSLIST	0.03	0.00	0.16	0.00	1.00	0.02	0.04***	0.03	0.01***
STATE	36.09	39.89	25.13	0.00	88.58	31.83	39.86***	36.74	32.71***
PUBLIC	38.71	37.66	14.08	2.39	100.00	40.37	37.23***	38.05	42.18***
SIZE	6.19	6.15	0.44	2.35	8.77	6.05	6.30***	6.17	6.28***
DEBT	0.37	0.40	0.08	0.01	0.40	0.38	0.35***	0.37	0.37
BETA	0.81	0.98	0.54	−2.84	11.54	0.80	0.82	0.82	0.78**
GROW	3.08	2.38	2.81	−3.76	18.51	3.39	2.81***	3.05	3.25***
CASH	5.24	5.31	0.62	0.90	7.36	4.97	5.48***	5.21	5.40***
ROA	0.02	0.03	0.07	−0.30	0.24	−0.02	0.06***	0.02	0.05***
LAGCDPR	0.21	0.00	0.46	0.00	2.44	0.12	0.29***	0.21	0.22
LAGSDPR	0.38	0.00	1.50	0.00	11.40	0.38	0.37	0.36	0.48**

returns on assets, lower possibility of being cross-listed and higher lagged stock dividends. Contrary to our expectations, firms issuing cash dividends are more likely to be cross-listed and firms issuing stock dividends are less likely to be cross-listed. As univariate analysis examines the effect of each variable in isolation, the results should be interpreted with caution and further examined under multivariate analysis, which is presented later.[6]

Table 4 reports the correlations between the variables. Based on Pearson correlations, cash dividend payout ratios (CDPR) are positively correlated with STATE (0.17), SIZE (0.16), CASH (0.26), ROA (0.29) and LAGCDPR (0.21), and negatively correlated with PUBLIC (−0.10) and GROW (−0.11). Hence the univariate statistics are consistent with the notion that firms with higher state ownership, lower public ownership, higher accounting returns, higher cash balances, higher prior year cash dividends and lower growth opportunities tend to have higher cash dividend payout rates. On the other hand, the Pearson correlations show that stock dividend payout rates (SDPR) are positively related to PUBLIC (0.09), CASH (0.04), ROA (0.04) and LAGSDPR (0.03), and negatively related to FOREIGN (−0.05), CROSSLIST (−0.04) and STATE (−0.05). Hence, firms with higher public ownership, more cash, higher profitability and higher prior year stock dividends tend to have higher stock dividends, while firms with higher STATE ownership tends to have lower stock dividends. Again, these results should be interpreted with caution because the analysis is conducted on each variable in isolation.

Explanatory variables with high correlations include those between ownership variables, such as PUBLIC and FOREIGN (with a Pearson correlation coefficient of −0.45 and a Spearman coefficient of −0.40), FOREIGN and CROSSLIST (both Pearson and Spearman coefficients are 0.40), and PUBLIC and STATE (with a Pearson correlation coefficient of −0.33 and a Spearman coefficient of −0.35). Other high correlations between control variables are SIZE and CASH (both Pearson and Spearman coefficients

[6] The values reported in the cash dividend and stock dividend columns in Table 3 also include firms paying both cash and stock dividends. Such "joint paying" firms (795 firm-year observations) are less likely to be cross-listed, have lower foreign ownership, but are larger, have bigger cash balances and higher ROA. Other differences are insignificant.

Table 4
Correlation analysis. CDPR = Cash dividends payout ratio, calculated as cash dividend per share paid in a year divided by earnings per share; SDPR = Stock dividend rate, calculated as stock dividend per share distributed in a year divided by earnings per share; FOREIGN = the percentage of equity shares owned by foreign shareholders; CROSSLIST = 1 for firms cross-listed in stock exchanges outside mainland China and 0 otherwise; STATE = the percentage of equity shares owned by the government; PUBLIC = percentage of shares owned by the general public; SIZE = log10(total assets), DEBT = total liabilities to total assets ratio; BETA = estimate of beta of the firm; GROW = market to book ratio; CASH = log10(Cash balance); ROA = return on assets. LAGCDPR and LAGSDPR are lagged (one year) measures of cash and stock dividends, respectively. T-tests values are computed assuming unequal variances. ***, ** and * represent significance at 0.01, 0.05 and 0.10 levels respectively. The upper diagonal figures are Spearman correlations and the lower diagonal values are Pearson correlations.

	CDPR	SDPR	FOREIGN	CROSS-LIST	STATE	PUBLIC	SIZE	DEBT	BETA	GROW	CASH	ROA	LAGCDPR	LAGSDPR
CDPR	1.00	0.08***	0.02*	0.04***	0.19***	−0.14 ***	0.23***	0.03***	0.00	−0.05***	0.35***	0.51***	0.35***	0.07***
SDPR	0.00	1.00	−0.05***	−0.06***	−0.05***	0.08***	0.09***	0.02**	−0.05***	0.07***	0.12***	0.20***	0.08***	0.13***
FOREIGN	−0.01	−0.05***	1.00	0.40***	−0.08***	−0.40***	0.18***	0.01	0.00	−0.01	0.15***	0.01	0.02	−0.03***
CROSSLIST	0.01	−0.04**	0.40***	1.00	0.07***	−0.24***	0.22***	0.06***	0.00	−0.06***	0.19***	0.07***	0.05***	−0.04***
STATE	0.17***	−0.05***	−0.08***	0.08***	1.00	−0.35***	0.20***	0.07***	0.00	0.00	0.18***	0.10***	0.10***	−0.02**
PUBLIC	−0.10***	0.09***	−0.45***	−0.28***	−0.33***	1.00	−0.04***	0.04***	0.03***	−0.19***	−0.08***	−0.11***	−0.01	0.07***
SIZE	0.16***	0.01	0.21***	0.31***	0.23***	−0.09***	1.00	0.35***	−0.03***	−0.33***	0.74***	0.18***	0.26***	0.09***
DEBT	0.01	0.01	0.02	0.07***	0.08***	−0.01	0.30***	1.00	−0.01	−0.11***	0.12***	0.01	0.07***	0.03***
BETA	0.01	−0.01	0.00	0.00	0.01	0.03***	0.00	−0.01	1.00	0.05***	0.00	−0.05***	0.01	−0.03**
GROW	−0.11***	0.02	0.00	−0.05***	−0.04 ***	−0.11***	−0.27***	−0.09***	−0.01	1.00	−0.21***	0.11***	−0.21***	−0.02
CASH	0.26***	0.04***	0.14***	0.20***	0.20***	−0.08***	0.74***	0.10***	0.04***	−0.19***	1.00	0.34***	0.25***	0.09***
ROA	0.29***	0.04***	0.00	0.06***	0.12***	−0.07***	0.28***	0.02**	0.02	−0.03**	0.46***	1.00	0.27***	0.13***
LAGCDPR	0.21***	−0.00	0.00	0.04**	0.09***	−0.02*	0.14***	0.05***	0.01	−0.12***	0.15***	0.13***	1.00	0.17***
LAGSDPR	0.02	0.03***	−0.03*	−0.03**	−0.02*	0.06****	0.02*	0.02	−0.02	−0.03**	0.03**	0.01	0.03***	1.00

Table 5
Regression analysis: determinants of cash and stock dividends the regression is based on 7519 observations over 2001–2006 and includes all listed firms in China. The dependent variables are cash dividend payout ratio, calculated as cash dividend per share paid in a year divided by earnings per share, and stock dividend, calculated as stock dividend per share distributed in a year divided by earnings per share. STATE is the percentage of equity shares owned by the government. FOREIGN is the percentage of equity shares owned by foreign shareholders; CROSSLIST = 1 for firms cross-listed in stock exchanges outside mainland China and 0 otherwise; PUBLIC is the percentage of equity shares owned by public shareholders; SIZE = log10(total assets), DEBT = total liabilities to total assets ratio; BETA = estimate of beta of the firm; GROW = market to book ratio; CASH = log10(Cash balance); ROA = return on assets. LAGCDPR and LAGSDPR are lagged (one year) measures of cash and stock dividends, respectively. In each regression we also put in INDUSTRY, indicator variables for industries and YEAR, indicator variables controlling for year effects. For simplicity of presentation the last two items are not shown here. ***, **, * represent significance at 0.01, 0.05 and 0.10, respectively. Robust standard errors are used to compute the *t*-statistics.

	Cash dividend	Stock dividend
INTERCEPT	0.2655***	−0.3998
STATE	0.0010***	−0.0018**
FOREIGN	−0.0010***	−0.0031
CROSSLIST	−0.0784***	−0.2134***
PUBLIC	−0.0016***	0.0072***
SIZE	−0.0212	0.0194
DEBT	−0.5280***	0.3081
BETA	0.0114	−0.0722*
GROW	−0.0111***	0.0154***
CASH	0.0753***	0.1199**
ROA	0.8220***	0.7275**
LAGCDPR	0.2311***	
LAGSDPR		0.0331**
Adj R-sq	0.2076	0.0218
F-value	88.21***	12.54***

are 0.74), SIZE and DEBT (with a Pearson correlation coefficient of 0.30 and a Spearman coefficient of 0.35), and CASH and ROA (with a Pearson correlation coefficient of 0.46 and a Spearman coefficient of 0.34). Nonetheless, analysis based on variance inflation factors (VIFs) indicate that none of the explanatory variables have VIF values larger than 10, alleviating the concern of severe multicollinearity problems.

5.2. OLS and TOBIT regressions

We present the results of OLS regressions for both cash and stock dividends, respectively in Table 5. Consistent with our hypotheses, cash dividend payment varies positively with STATE ownership and negatively with FOREIGN ownership, PUBLIC ownership and CROSSLIST. These results are consistent with the notion that firms with higher state ownership distribute more cash dividends and that they might even do so to tunnel cash to major shareholders (state) in situations when cash dividend payments might not be the best strategy for the firm. Interestingly, both foreign ownership and cross-listings have significant negative effects on cash dividends, consistent with the expected moderating effect on tunneling activity. As expected, the results on PUBLIC (individual) ownership are the opposite of those for STATE ownership. For control variables, firms with higher cash balances and higher return on assets are more likely to pay higher cash dividends in order to signal their value. All of these results are consistent with the signaling theory of dividend payments. Also, firms with lower growth rates (more mature firms) are more likely to pay cash dividends, consistent with the notion that mature firms pay more dividends. In addition, cash dividend levels are positively and significantly related to lagged cash dividends in the previous fiscal year,

Table 6
Tobit analysis: determinants of cash and stock dividends. The regression is based on 7519 observations over 2001–2006 and includes all listed firms in China. The dependent variables are cash dividend payout ratio, calculated as cash dividend per share paid in a year divided by earnings per share, and stock dividend, calculated as stock dividend per share distributed in a year divided by earnings per share. STATE is the percentage of equity shares owned by the government. FOREIGN is the percentage of equity shares owned by foreign shareholders; CROSSLIST = 1 for firms cross-listed in stock exchanges outside mainland China and 0 otherwise; PUBLIC is the percentage of equity shares owned by public shareholders; SIZE = log10(total assets), DEBT = total liabilities to total assets ratio; BETA = estimate of beta of the firm; GROW = market to book ratio; CASH = log10(Cash balance); ROA = return on assets. LAGCDPR and LAGSDPR are lagged (one year) measures of cash and stock dividends, respectively. In each regression we also put in INDUSTRY, indicator variables for industries and YEAR, indicator variables controlling for year effects. For simplicity of presentation the last two items are not shown here. ***, **, * represent significance at 0.01, 0.05 and 0.10, respectively.

	Cash dividend	Stock dividend
INTERCEPT	−0.3261**	−21.301***
STATE	0.0009***	−0.0164***
FOREIGN	−0.0024***	−0.0225
CROSSLIST	−0.1449***	−5.2975***
PUBLIC	−0.0032***	0.0530***
SIZE	−0.1054***	1.1708***
DEBT	−0.4692***	3.2992**
BETA	0.0336**	−0.4845**
GROW	−0.0457***	0.2024***
CASH	0.2715***	0.9551***
ROA	3.9949***	27.826***
LAGCDPR	0.3885***	
LAGSDPR		0.1535**
Pseudo R-sq	0.1847	0.0145
Log-likelihood	−4754.44***	−5336.53***

which provides evidence of the clientele effect on dividends. Finally, firms with higher debt pay less cash dividends.

The results of OLS regressions on stock dividends imply that the determinants of stock dividends are different from those of cash dividends. First, consistent with our hypotheses and in contrast to the findings on cash dividends, stock dividends are negatively associated with STATE ownership and positively associated with PUBLIC ownership. Note that the coefficient on PUBLIC is now significantly positive, indicating that firms with higher individual ownership (free float) are more likely to pay more stock dividends, which is consistent with the literature (Wei et al., 2004; Cheng et al., 2006). Because the coefficient on PUBLIC in the cash dividends model is significantly negative, it suggests that stock and cash dividends are probably perfect substitutes from the perspective of individual shareholders. Unlike cash dividends, stock dividends have no wealth redistribution effect. Hence, it is also natural that firms with higher state ownership distribute less stock dividends. CROSSLIST is significantly negative here, which is not consistent with our hypothesis on the effect of cross-listing on stock dividends. For control variables, firms with higher growth opportunities (GROW), more cash (CASH), higher profitability (ROA) and lower risk (BETA) are more likely to pay stock dividends. Firms with these attributes are more growth-oriented, hence these firms are trying to preserve their cash to take advantage of growth opportunities. In addition, stock dividend levels are positively and significantly related to those of the previous fiscal year, which again provides evidence of the clientele effect on dividends.

The results are robust even when Tobit analysis is used instead of OLS regressions. Table 6 reports the results using TOBIT analysis. For cash dividends, except for a difference in the significance of the SIZE

Table 7
Regression analysis: determinants of cash and stock dividends to earnings per share ratio the regression is based on 7519 observations over 2001–2006 and includes all listed firms in China. The dependent variables are cash dividend payout ratio, calculated as cash dividend per share paid in a year divided by earnings per share, and stock dividend, calculated as stock dividend per share distributed in a year divided by earnings per share. STATE is the percentage of equity shares owned by the government. FOREIGN is the percentage of equity shares owned by foreign shareholders; CROSSLIST = 1 for firms cross-listed in stock exchanges outside mainland China and 0 otherwise; PUBLIC is the percentage of equity shares owned by public shareholders; SIZE = log10(total assets), DEBT = total liabilities to total assets ratio; BETA = estimate of beta of the firm; GROW = market to book ratio; CASH = log10(Cash balance); ROA = return on assets. LAGCDPR and LAGSDPR are lagged (one year) measures of cash and stock dividends, respectively. In each regression we also put in INDUSTRY, indicator variables for industries and YEAR, indicator variables controlling for year effects. For simplicity of presentation the last two items are not shown here. ***, **, * represent significance at 0.01, 0.05 and 0.10, respectively. Robust standard errors are used to compute the t-statistics.

	Cash dividend	Stock dividend
INTERCEPT	0.2488****	−0.4338
STATE	0.0016***	0.0017
FOREIGN	0.0009	−0.0046
CROSSLIST	−0.0873**	−0.1691**
PUBLIC	−0.0013***	0.0101***
SIZE	−0.0224	0.0648
DEBT	−0.5208***	0.3103
BETA	0.0118	−0.0723*
GROW	−0.0109***	0.0149***
CASH	0.0766***	0.1199**
ROA	0.8142***	0.7429***
LAGCDPR	0.2303***	
LAGSDPR		0.0324*
STATE*FOREIGN	−0.0001***	0.0001
STATE*CROSSLIST	0.0010	−0.0024
STATE*PUBLIC	−0.0000	−0.0001
Adj *R*-sq	0.2093	0.0224
F-value	82.26***	12.08***

variable, which is now significant, the qualitative results are the same as in Table 5. The results for stock dividends are also consistent with those in Table 5.[7]

[7] We also would like to report some results which for conciseness are not provided in the tables. First, in Tables 5 and 6, we put both FOREIGN and CROSSLIST in the regressions. One potential criticism is that these are overlapping measures. However, in the Chinese setting, this is not true. The correlation between the variables in our sample is 0.40 which is not exceedingly large. FOREIGN captures ownership by foreign investors in the listed firms through strategic ownership or direct investment on both domestic and foreign markets, while CROSSLIST measures share percentage traded on foreign exchanges. Nonetheless, if we use only FOREIGN or CROSSLIST (but not both) in the regression, they are still be negative and significant in the regression for cash dividends, insignificant for FOREIGN but marginally significant for CROSSLIST in stock dividends. Second, we explore the effects of controlling for stock dividends (lagged and non-lagged) in the cash dividend model and cash dividends (lagged and non-lagged) in the stock dividend model. We do not find any significant results for these additional controls, suggesting that cross effects among cash and stock dividends do not exist. Third, we explore the possibility of using both stock and cash dividends versus stock dividends as a signal of future prospects. We use a logit regression for our analysis as it is difficult to find a basis to sum up both dividends. We find that firms paying both cash and stock dividends, when compared with firms paying stock dividends only, tend to be larger, with higher ROA, higher market to book ratios and more cash. Nonetheless, they also have much lower state ownership or cross-listing, which are the typical features of cash dividend paying firms. Hence firms paying cash and stock dividends have the hybrid characteristics of firms paying cash dividends alone and firms paying stock dividends only. However, since one of our research focuses is to contrast the two types of dividends, our analysis concerning firms paying both types of dividends is supplementary at best.

5.3. Sensitivity tests

In this section, we perform several sensitivity tests to verify the robustness of our results. First, as alternative measures of dividend payout ratios, we use dividends per share (DPS) and dividends per share divided by net sales per share. The results are qualitatively the same as those reported.

Second, to test the robustness of our results using ROA as a proxy for profitability, we use return on equity (ROE). Again, the results are qualitatively similar to those reported above.

Third, we test whether other shareholders mediate the effect of state ownership on dividend policies. Table 7 reports these results. With the interaction terms between state ownership and other ownership variables added in the cash dividend regression, FOREIGN is not significant but CROSSLIST is significantly negative. However, the interaction effect STATE*FOREIGN is negative and significant at the 0.001 level, consistent with the notion that foreign ownership (FOREIGN) in effect suppresses cash tunneling by state owners (STATE). The results are different for stock dividends. Here the interaction term STATE*FOREIGN is not significant, which is expected as stock dividends have no cash effect. Our results are also consistent with a recent line of literature that argues that foreign ownership is useful in restraining controlling shareholders in their exploitation of domestic minority shareholders (Leuz and Oberholzer-Gee, 2006).

Finally, a common concern in using a panel dataset like ours is inference problems due to the correlation of the residuals across firms and across years, which may result in estimation bias (Fama and MacBeth, 1973). To alleviate this concern, we re-perform our OLS analysis using the Fama-MacBeth approach. Our results (not presented here) indicate that such a bias is not likely to affect our conclusions.[8]

6. Conclusions

In this paper, we investigate whether firms with different ownership characteristics have different dividend policies. As indicated in the dividend literature, dividends play a signaling role. Also, dividends could be used by state-owned agents who are majority shareholders to tunnel money from state-controlled firms to themselves (tunneling effect). Such a situation could especially be dominant in emerging markets.

[8] We summarize here other sensitivity tests we have performed. First, we perform tests to study the effect of rights issues on both types of dividends. We find that the rights issue variable is significantly positive for both stock and cash dividends, signifying the importance of future financing in dividend decisions in China. Second, we examine the effect of ownership concentration. Our measure of concentration is HOLD, which is defined as the percentage of shares owned by the top 10 shareholders. We find that HOLD is significantly positively related to cash dividends, signifying that cash dividends are more prevalent among concentrated firms, which is consistent with the tunneling story. In contrast, HOLD is significantly negatively related to stock dividends, consistent with the notion that stock dividends are prevalent for low concentration firms. Third, we examine tunneling activities through intercorporate loans in China. Using other receivables to total assets (ORECTA) ratio, we find that the variable is significantly negative in the cash dividend regression. We interpret this result as suggesting that cash dividends and intercorporate loans are substitutes for tunneling. We do not find a significant effect of ORECTA on stock dividends. Fourth, we decompose foreign shareholders into foreign individual and foreign institutional shareholders. We find that the negative effect of foreign ownership on cash dividends is driven by foreign individual shares and not by foreign institutional shares. When we exclude the foreign institutional shares from the definition of total foreign ownership, the negative effect of foreign ownership on cash dividends is even more significant. Fifth, we perform a test on the potential influence of the split share structure reform (2005–2007). As mentioned in Note 2, state shares were typically non-tradable during the period of our study, as they could only be bought and sold through private placement with special approval from the government. However, in 2005, the Chinese government launched a reform on split share structure by converting non-tradable shares (state and legal person shares) into tradable shares. We perform the regressions separately for the two sub-periods - one with the data on or before 2004 and another after 2004. We find that the significance of the variables in the regressions does not vary much from the tabled results. Finally, an alternative explanation of our results could be that firms in different stages of their life cycle have different preferred dividend choices. Firms with high maturity (larger in size and with lower growth rates) are more likely to distribute cash dividends, while firms with lower maturity (smaller and higher growth) are more likely to distribute stock dividends. To shed light on this issue, we group our observations into four different partitions: HA-HG, HA-LG, LA-HG and LA-LG, where HA is for firms with above mean SIZE, LA is for firms with SIZE at or below the mean value, HG is for firms with above mean GROW and LG is for firms with GROW at or below the mean value. Based on these partitions, our variables of interest, FOREIGN and CROSSLIST have the expected signs in all four regression segments. CROSSLIST is significant for the large firm segments. This is reasonable as larger firms are more likely to be cross-listed than smaller firms and thus they have more variation in these segments. FOREIGN, however, is highly significant in small firms with high growth rates. This is expected as smaller firms are less likely to be cross-listed and the differentiating factor is more likely to be FOREIGN. The results are robust when we use median rather than mean values to differentiate between high and low observations.

Using firms from the emerging market of China, we examine whether the above effects exist in corporate dividend policy and practice. We find that both foreign ownership and cross-listing have significant negative effects on cash dividends, consistent with the notion of reduced tunneling activities for firms with the ability to raise capital outside of China. Consistent with the tunneling hypothesis, we find that firms with higher state ownership tend to pay higher cash dividends and lower stock dividends. In addition, firms with higher individual (public) ownership pay lower cash dividends and higher stock dividends.

These results have significant implications for researchers, investors, policy-makers and regulators. Our results indicate that foreign shareholders prefer low cash dividends, suggesting that foreign investors help reduce tunneling activities in firms in emerging markets. Our results further suggest the benefits of fostering foreign investors' activities in public companies in emerging markets.

In addition, in contrast to prior literature, our results document an inverse trend with fewer firms paying cash dividends over the period 2001–2006 than the previous period, which helps to shed light on a time-series shift in dividend policies. These results suggest a dynamic approach is needed for researchers to investigate dividend payment policies.

Also, the results on the role of majority shareholders, such as state shareholders in the unique setting of China, can help us obtain a better understanding of the role of government ownership in the business world, as more governments in western countries have obtained and/or increased state ownership in business enterprises during the recent economic crisis.

Finally, our results help investors obtain a comprehensive understanding of the different roles of various shareholders in shaping corporate dividend policies. Further, our results show that growth opportunities, cash flow and profitability have similar effects on dividends in the emerging market of China as documented by prior literature (Alpa, 2005; Goergen et al., 2005), which helps investors determine their investment strategies.

References

Allen, F., Bernardo, A., Welch, I., 2000. A theory of dividends based on tax clientele. Journal of Finance 55, 2499–2536.

Alpa, D., 2005. Corporate dividend policy: the views of British financial managers. Journal of Business Finance and Accounting 32 (7/8), 1625–1672.

Bhattacharya, S., 1979. Imperfect information, dividend policy and "the bird in the hand" fallacy. Bell Journal of Economics 10, 259–270.

Brav, A., Graham, J.R., Harvey, C.R., Michaely, R., 2005. Payout policy in the 21st century. Journal of Financial Economics 77 (3), 483–527.

Chen, D., Jian, M., Xu, M., 2009. Dividends for tunneling in a regulated economy: the case of China. Pacific-Basin Finance Journal 17, 209–223.

Chen, G., Firth, M., Gao, N., 2002. The information content of concurrently announced earnings, cash dividends and stock dividends: an investigation of the Chinese stock market. Journal of International Financial Management and Accounting 13 (2), 101–124.

Chen, K., Yuan, H., 2004. Earnings management and capital resource allocation: evidence from China's accounting-based regulation of rights Issues. The Accounting Review 79, 645–665.

Cheng, L., Fung, H., Leung, T., 2006. Why do Chinese investors prefer stock dividends to cash dividends? Working paper, University of Missouri and Hong Kong Polytechnic University.

Cheng, L., Fung, H., Leung, T., 2007. Why do poorly performing firms pay cash dividends? Evidence from mainland China and Hong Kong, Working paper, University of Missouri and Hong Kong Polytechnic University.

Cheng, L., Fung, H., Leung, T., 2009. Dividend preferences of tradable-share and non-tradable-share holders in Mainland China. Accounting and Finance 49, 291–316.

Choe, H., Kho, B.C., Stulz, R., 2005. Do domestic investors have an edge? The trading experience of foreign investors in Korea. Review of Financial Studies 18, 795–829.

Choi, J.J., Park, S., Yoo, S., 2007. The value of outside directors: Evidence from corporate governance reform in Korea. Journal of Financial and Quantitative Analysis 42, 941–962.

Choi, J., Sami, H., Zhou, H., 2009. Corporate ownership and bid-ask spread: Evidence on information asymmetry in Chinese capital markets, Working paper, Temple University, Lehigh University and University of Texas Pan American.

Chong, L.M., Wang, S., 2004. Understanding Chinese Financial Statements. Shanghai University of Finance and Economic Press, Shanghai China.

CSRC., 2005. Circular on issues relating to the pilot reform of listed companies split share structure, China Securities Regulatory Commission, No.5.

DeAngelo, H., Masulis, R.W., 1980. Leverage and dividend irrelevancy under corporate and personal taxation. The Journal of Finance 35, 453–464.

Easterbrook, F.H., 1984. Two agency-cost explanations of dividends. The American Economic Review 74, 650–659.

Faccio, M., Lang, L., Young, L., 2001. Dividends and expropriation. The American Economic Review 91 (1), 54–78.

Fama, E., Jensen, M., 1983. Separation of ownership and control. Journal of Law and Economics (June), : 301–325.
Fama, E.F., MacBeth, J.D., 1973. Risk, return and equilibrium: Empirical tests. Journal of Political Economy 81, 607–636.
Ferguson, M.J., Lam, K.C., Lee, G.M., 2002. Voluntary disclosure by state-owned enterprises listed on the stock exchange of Hong Kong. Journal of International Financial Management and Accounting 13 (2), 125–142.
Frankfurter, G.M., Lane, W.R., 1992. The rationality of dividends. International Review of Financial Analysis 1, 115–129.
Fuerst, O., 1998. A theoretical analysis of the investor protection regulations argument for global listing of stocks. Working paper, Yale School of Management.
Goergen, M., Correia da Silva, L., Renneboog, L., 2005. When do German firms change their dividends?. Journal of Corporate Finance 11 375–399.
Grinblatt, M., Masulis, R.W., Titman, S., 1984. The valuation effects of stock splits and stock dividends. Journal of Financial Economics 13, 461–490.
GTA., 2010. China Listed Firms' Cash and Stock Dividends Research Database. User Guide GTA Information Technology Company Limited. Centre for China Financial Research of the University of Hong Kong.
Jensen, M.C., 1986. Agency costs of free cash flow, corporate finance, and takeovers. The American Economic Review 76, 323–329.
Jensen, M., Meckling, W., 1976. Theory of the firm: managerial behavior, agency costs, and ownership structure. Journal of Financial Economics 3 (October), 305–360.
Jensen, G.R., Solbreg, D.P., Zorn, T.S., 1992. Simultaneous determination of insider ownership, debt, and dividend Policies. Journal of Financial and Quantitative Analysis 27 (2), 247–263.
Jiang, G., Lee, C.M., Yue, H., 2010. Tunneling through intercorporate loans: the China experience. Journal of Financial Economics 98, 1–20.
John, K., Kalay, A., 1982. Costly contracting and optimal payout constraints. The Journal of Finance 37, 457–470.
John, K., Williams, J., 1985. Dividends, dilution, and taxes: a signaling equilibrium. The Journal of Finance 40, 1053–1070.
Kale, J.R., Noe, T.H., 1990. Dividends, uncertainty, and underwriting costs under asymmetric information. The Journal of Financial Research 13, 265–277.
Kieso, D.E., Weygandt, J., Warfield, T.D., 2007. Intermediate Accounting, 12 ed. Wiley, New Jersey.
Khan, T.S., 2006. Company dividends and ownership structure: evidence from UK panel data. Economic Journal 116, 172–189.
Lakonishok, J., Lev, B., 1987. Stock splits and stock dividends: why, who and when? Journal of Finance 47, 913–932.
Lan, F.Y., 2001. On the Theory of Dividend Policy of Listed Companies in China. East China Normal University Press, China Shanghai, ISBN 7-5617-2385-7 (in Chinese).
La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R.W., 2000. Agency problems and dividend policies around the world. Journal of Finance 55 (1), 1–33.
Lee, J. and Xiao, X., 2004. Tunneling dividends. Working paper, Tulane University.
Leuz, C., Oberholzer-Gee, F., 2006. Political relationships, global financing, and corporate transparency: evidence from Indonesia. Journal of Financial Economics 81, 411–439.
Lin, C.H., Schiu, C., 2003. Foreign ownership in the Taiwan stock market: an empirical analysis. Journal of Multinational Financial Management 13 (1), 19–41.
Mancinelli, L., Ozkan, A., 2006. Ownership structure and dividend policy: evidence from Italian firms. European Journal of Finance 12 (3), 265–282.
Miller, M.H., Rock, K., 1985. Dividend policy under asymmetric information. Journal of Finance 40, 1031–1051.
Miller, M.H., Scholes, M.S., 1978. Dividends and taxes. Journal of Financial Economics 6, 333–364.
Milonas, T., Travlos, N., Xiao, J., Tan, C., 2006. The Ex-dividend day stock price behavior in the Chinese stock market. Pacific-Basin Finance Journal 14 (2), 155–174.
Rozeff, M.S., 1982. Growth, beta and agency costs as determinants of dividend payout ratios. The Journal of Financial Research 5, 249–259.
Sami, H., Zhou, H., 2004. A comparison of value relevance of accounting information in different segments of the Chinese stock market. International Journal of Accounting, 403–427.
Shiller, R.J., 1984. Stock prices and social dynamics. Brookings Papers on Economic Activity, 457–510.
Szilagyi, P.G., Renneboog, L., 2007. How relevant is dividend policy under low shareholder protection? Working paper, University of Cambridge and Tilburg University.
Thomsen, S., 2005. Conflicts of interest or aligned incentives? Blockholder ownership, dividends and firm value in the US and the EU. European Business Organization Law Review 6 (2), 201–226.
Wei, G., Xiao, J., 2009. Equity ownership segregation, shareholder preferences and dividend policy in China. The British Accounting Review 41, 169–183.
Wei, G., Zhang, W., Xiao, J., 2004. Dividends payment and ownership structure in China. Advances in Financial Economics 9, 187–219.
Wilkinson, B.R., Cahan, S.F., Jones, G., 2001. Strategies and dividends imputation: the effect of foreign and domestic ownership on average effective tax rates. Journal of International Accounting, Auditing, and Taxation 10, 157–175.

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Banking system reform, earnings quality and credit allocation

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ABSTRACT

This paper investigates credit allocation before and after the 2003 banking system reform in China. We find that relationships between earnings quality and new short-term loans, long-term loans and total loans in listed companies changed significantly after the banking system reform, especially in state-owned listed companies. Further investigation shows that due to the influence of rent-seeking, banks have eased the earnings requirements of non-state-owned listed companies. These findings enhance our understanding of the economic consequences of the banking system reform and of credit discrimination under the new regime.

1. Introduction

Government intervention in the financial system to promote the development of the capital markets is one of the distinguishing characteristics of China's transitional economy. Theorists and practitioners have long held that ownership is an important factor that determines China's financial resource allocation and that there

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is serious non-equilibrium credit rationing[1] in China's credit market with discrimination against non-state-owned enterprises (Brandt and Li, 2003; Cull and Xu, 2005; Sun et al., 2005). Relative to state-owned enterprises, the financial resources obtained by non-state-owned enterprises do not support the value created or "ownership determinism" theory. However, Fang (2010) implies that the financial discrimination that non-state-owned enterprises suffer is more likely to be due to their own strategy decisions or "corporate decisions" theory.

However, due to the mandatory change in China's financial market, commercial banks and borrowers have long been active participants in the market and thus research on credit resource allocation should pay more attention to the rent-seeking of banks that originates from their monopoly. Xue and Zhu (2010) find that the financial reform at the end of 2003 did not affect property rights arrangements, nor did it change banks' forecasts of soft budget constraints, as borrowers' debt maturity choices depend on banks' rent-seeking characteristics. This paper takes ownership into account and studies whether state-owned enterprises and non-state-owned enterprises had different credit sources during the process of institutional change, whether banks' rent-seeking affects the loan allocation structure and whether the banking system reform has promoted the marketization of credit resource allocation.

We investigate credit allocation efficiency before and after the 2003 banking system reform and find that since the banking system reform, the role of earnings quality has been enhanced in the credit market and the relationships between earnings quality and new short-term loans, long-term loans and total loans have changed significantly in listed companies, especially in state-owned listed companies. Further research implies that due to the influence of rent-seeking (Xue and Zhu, 2010), commercial banks have loosened the earnings requirements of non-state-owned listed companies.

The remainder of this paper is organized as follows. Section 2 discusses the related literature and hypotheses. Section 3 covers the data, variables and descriptive analysis. Section 4 provides the empirical methodology and presents the empirical findings and robustness tests, and Section 5 concludes.

2. Related literature and hypotheses

2.1. Impact of soft budget constraints and banks' rent-seeking on credit allocation

When legal systems are weak, government regulation and financial intervention may be external constraints to running financial markets in emerging economies. Due to socialist governments' "father complex" toward state-owned enterprises (Kornai, 1980; Kornai et al., 2003) and government compensation for policy loss during transition periods (Lin et al., 1994/1999, 1997, 2004), governments tend to relax financial discipline and soften budget constraints (Kornai, 1980). When state-owned commercial banks themselves benefit from soft budget constraints and expect the government to redeem them, they will inevitably weaken its oversight role. Further, the increased government-backed interest may result in bankruptcy, harm owners' benefits and generate enormous social costs (Akerlof and Romer, 1993). This in turn leads to more widespread soft budget constraints (Berglof and Roland, 1995). Gao and Schaffer (1998) find that in transition countries, soft budget constraints give unprofitable enterprises access to bank credit more easily, thus the resource allocation efficiency of the banking system is lower. Studies on China's financial market show that ownership and political relations are important in giving enterprises access to long-term loans, with state-owned enterprises receiving more long-term loans at lower credit standards (Sun et al., 2005; Jiang and Li, 2006; Zhang et al., 2010).

Before the banking system reform, a dual soft budget constraints mechanism[2] substituted for a creditor protection mechanism, which to a certain extent reduced the commercial banks' losses but caused state-owned

[1] In contrast to non-equilibrium credit rationing, equilibrium credit rationing is due to information asymmetry or customer relationships (Jaffee and Russell, 1976; Williamson, 1986).

[2] Soft budget constraints contain at least two subjects: the constrained object and the supporter (Kornai et al., 2003). Constrained objects are limited by their own resources. If they make a loss, then they will not survive without external aid. Supporters are controlled by government and can transfer resources to aid troubled firms. After January 1, 1985, China's commercial banks replaced fiscal appropriation and became supporters of soft budget constraints, whereas the Central Bank became the supporter of the commercial banks and an eventual lender to state-owned enterprises and banks, creating a dual soft budget constraint.

commercial banks to neglect their credit risk control, which led to more serious soft budget constraints. The mixed property rights between state-owned commercial banks and state-owned listed enterprises induced some state-owned enterprises to regard credit loans from state-owned commercial banks as "free capital." Once they obtained such loans, diversion and embezzlement were inevitable.[3] At the same time, state-owned commercial banks that had a monopoly over financial resources inevitably sought rent, which resulted in a large number of "relation-loans" or "corruption-loans" and eventually produced a large amount of non-performing loans that had to be borne by the government. Negotiation between banks and enterprises led not only to "state-owned enterprise escape," but also to "non-state-owned enterprise escape." In the long run, state-owned commercial banks' exclusive monopoly over financial resources caused serious corruption, which threatened China's financial stability (Xie and Lu, 2005).

2.2. Impact of the banking system reform on budget constraints

Before 2003, China's financial market reform mainly served the development of the capital market and did not display characteristics of independence and marketization. The dual soft budget constraint and rent-seeking behavior led state-owned commercial banks to the edge of "technical bankruptcy" (Xie and Lu, 2005). The Chinese government responded with a new round of financial reforms at the end of 2003 that involved the following aspects. (1) Capital injection and financial restructuring – at the end of 2003 and beginning of 2004, the Bank of China and the China Construction Bank received injections of US$22.5 billion and US$45 billion, respectively, of foreign exchange reserves and sold US$278.7 billion of suspicious bad assets to Xinda Assets Management Companies. On November 6, 2008, Central Huijin Investment injected US$19 billion into the Agriculture Bank of China. In April 2005, Central Huijin Investment injected US$15 billion into the China Industrial and Commercial Bank. By 2005, the proportion of non-performing loans of these banks had fallen to below 5% and their capital adequacy ratio had reached the 8% required by the Basel New Capital Accord (Basel II) of 2006. (2) Corporate governance system improvement – according to "Guidance on the Corporate Management of Joint-stock Commercial Banks" released by the People's Bank of China in June 2002, "Guidance on the Corporation Governance Reform and Supervision of Bank of China and China Construction Bank" released by the China Banking Regulatory Commission in 2004 and "Guidance on the Corporation Governance Reform and Supervision of Stated-owned Commercial Banks" released in April 2006, the three banks set up a corporate governance structure and introduced international investment banks as strategic investors to optimize the shareholding structure. (3) Exchange listings – after a series of capital injections, financial restructuring and the issuance of new shares, China Construction Bank listed on the Hong Kong Stock Exchange on October 27, 2005; the Bank of China listed on the Hong Kong Stock Exchange on June 1, 2006 and on the Shanghai Stock Exchange on July 5 of that year, and the China Industrial and Commercial Bank listed on both the Shanghai and Hong Kong Stock Exchanges on October 27, 2006. The Agricultural Bank of China Co., Ltd. was established on January 16, 2009 and listed on the Shanghai and Hong Kong Stock Exchanges on July 15 and 16 of that year, respectively. (4) Financial legal system construction – to ensure the smooth reform of the financial system, the sixth meeting of the NPC Standing Committee promulgated the "Law of the People's Republic of China on the People's Bank of China (Revised)", the "Law of the People's Republic of China on Commercial Banks (Revised)" and the "Banking Supervision Law of the People's Republic of China." The three laws were executed in early 2004. The People's Bank of China and the China Banking Regulatory Commission either individually or jointly issued nearly 60 regulations and guidelines in 2004.

Wu and Bai (2009) find that the financial system reform at the end of 2003 significantly tightened budget constraints, but due to the mandatory nature of the reform the economic system retained automaticity during the reform period (Aoki and Okuno, 2005). Xue and Zhu (2010) note that the financial reform, bound by the cost–benefit balance of state-owned banks and enterprises, has not alleviated banking corruption.

[3] There were widespread problems in the restructuring of state-owned enterprises and borrowers diverted and embezzled their debt in the weak legal environment, harming creditors' interests.

According to the foregoing analysis, before the reform there was a weak legal environment, soft budget constraints and banking corruption in China's financial market. After the reform, the soft budget constraints were eased, but the rent-seeking behavior of banks was not totally resolved. Thus, it is particularly important to study the relationships between banking reform, banking corruption and credit discrimination. This paper focuses on two aspects of these issues: the change in the relationship between ownership and access to loans after the financial reform and the difference in total loans between state-owned enterprises and non-state-owned enterprises after the financial reform.

2.3. Impact of financial reform on the decisions of lenders and borrowers: Hypothesis 1

It has been proved that earnings quality has a significantly negative influence on the cost of capital (Francis et al., 2002, 2003, 2005; Chow, 2008). According to the foregoing analysis, the mandatory reform was triggered not only by government, but also by the urgent need for the development of the financial market at this stage. In the long run, market-oriented resource allocation is not only needed by listed companies and commercial banks, but is also a fundamental way to improve the efficiency of resource allocation. After the reform, along with the improvement of the legal environment, the quality of accounting information became more important to credit resource allocation. This is summarized as hypothesis 1.

H1. The banking reform enhanced the role of earnings quality in market-oriented credit resource allocation.

2.4. Impact of ownership on the effect of the banking reform: Hypothesis 2

Before the reform, state-owned enterprises did not have to pay rent because they were supported by soft budget constraints. Further, the controlling shareholders of state-owned enterprises and non-state-owned enterprises had different residual claims on the firm and thus shareholders had no motive to pay rent. Managers of state-owned enterprises were essentially asset exploiters and had no efficient resources to pay rent. In this case, due to the impulse of investment and credit rationing restrictions, non-state-owned enterprises become the main entities paying rent to the commercial banks. All other things being equal, non-state-owned enterprises that were willing to pay the rent had easier access to credit.

According to this analysis, China's financial market has two significant characteristics: soft budget constraints and rent-seeking. Thus, if state-owned enterprises with lower earnings quality obtain more loans after the reform, this means that government aid mechanisms have had an effect, whereas if non-state-owned enterprises with lower earnings quality obtain more loans then they must be paying rent. According to Xue and Zhu (2010), the reform has not really changed the nature of ownership and state-owned enterprises and commercial banks have not changed their use of soft budget constraints. In the short run, there is still an institutional basis for rent-seeking by banks after the reform, as non-state-owned enterprises are still the main entities that pay rent. All other things being equal, commercial banks will loosen the restriction on the earnings quality of non-state-owned enterprises. This is summarized as hypothesis 2.

H2. After the reform, commercial banks require lower earnings quality from non-state-owned enterprises than state-owned enterprises.

3. Sample, variables and descriptive analysis

3.1. Sample

Our data covers all A-share listed companies with financial data for the period 1998–2010.[4] Financial data and other annual data were obtained from the CSMAR and WIND databases. Data on non-state-owned

[4] We calculate earnings quality using the direct cash flow statements method. Accurate accruals data in the statement of cash flows is only available from 1998, so the initial year of our study is 1998.

enterprises was sourced from the CCER database. We exclude all utilities and financial institutions and winsorize the major variables at the 1% and 99% levels.

We investigate the impact of the financial reform on loan allocation to study whether the effect of ownership on loan allocation changes with an institutional change. Restricted by the measurement of earnings quality, we choose listed companies in the period 2001–2003 before the reform, and divide the period of our study of 2001–2009 at 2004 to obtain two stages, the pre-reform period from 2001 to 2003 and the post-reform period from 2005 to 2009.

3.2. Variables

(1) Bank loans

We use new short-term loans (Dls), new long-term loans (Dll) and new total loans (Dlt) to measure loan allocations, where Dls equals the difference between firm *i*'s closing and initial short-term loan balances divided by total assets, Dll equals the difference between firm *i*'s closing and initial long-term loan balances added to long-term loans of a maturity of less than 1 year divided by total assets, and Dlt equals the sum of Dls and Dll.

(2) Earnings quality

We use the modified Dechow–Dichev (2002, hereafter DD) measure to capture the quality attribute of main operating profits. We calculate 2001–2009 accrual quality using the relevant accounting information for rolling 5-year windows during 1998–2010:

$$\frac{\mathrm{TCA}_{i,t}}{\mathrm{AVASSET}_{i,t}} = \alpha_0 + \alpha_1 \frac{\mathrm{CFOBT}_{i,t-1}}{\mathrm{AVASSET}_{i,t}} + \alpha_2 \frac{\mathrm{CFOBT}_{i,t}}{\mathrm{AVASSET}_{i,t}} + \alpha_3 \frac{\mathrm{CFOBT}_{i,t+1}}{\mathrm{AVASSET}_{i,t}} + \alpha_4 \frac{\Delta\mathrm{REV}_{i,t}}{\mathrm{AVASSET}_{i,t}} + \alpha_5 \frac{\mathrm{PPE}_{i,t}}{\mathrm{AVASSET}_{i,t}} + \varepsilon_{i,t}$$

where $\mathrm{TCA}_{i,t}$: firm *i*'s total current accruals in year $t = (\mathrm{MOP}_{i,t} - \mathrm{CFOBT}_{i,t})$[5]; $\mathrm{CFOBT}_{i,t}$: cash flow from operations adjusted by tax in year $t = (\mathrm{CFO}_{i,t} - \mathrm{IncomeTaxReturns} + \mathrm{IncomeTaxExpense})$; $\mathrm{AVASSET}_{i,t}$: firm *i*'s average total assets in year t and $t-1$; $\Delta\mathrm{REV}_{i,t}$: firm *i*'s change in revenue between year t and $t-1$; $\mathrm{PPE}_{i,t}$: firm *i*'s gross value of property, plant and equipment in year t; EQ: the negative standard deviation of firm *i*'s estimated residuals from (I) and $\mathrm{EQ} = -\sigma(\hat{\varepsilon}_{i,t})$ (large (small) values of EQ corresponding to good (poor) earnings quality).

(3) External financing dependence

According to Rajan and Zingales (1998) and Xue and Zhu (2010), we modify external financing dependence to measure a firm's external financing requirements:

$$\mathrm{EXDEP}_{it} = \frac{\mathrm{CAPX}_{it} - \mathrm{CFO}_{it-1}}{\mathrm{AVASSET}_{it}},$$

where CAPXit: firm *i*'s capital expenditure in year t, which is equal to the sum of new long-term investment, fixed assets, intangible assets and other long-term assets; and CFO_{it_1}: firm *i*'s lagged operating cash flow in year t.

(4) Ownership

According to previous research, companies with different ownership types have a different loan structure. We thus code state-owned enterprises as 0 and non-state-owned enterprises as 1.

[5] The foreign literature calculates CFO as earnings before extraordinary items less total accruals. However, data on earnings before extraordinary items is not available before 2003 in China, so we use operating profit as a substitute and adjust operating cash flow to pretax CFO to be consistent with earnings.

(5) Control variables

Lagsize is the natural log of firm *i*'s lagged total assets. Gruber and Warner (1977) and Ang et al. (1982) find that bankruptcy costs as a percentage of a firm's value reduce with increasing firm size, because large firms are more inclined to diversify, which leads to a lower risk of bankruptcy. Empirical studies also find that leverage is greater in large firms (Rajan and Zingales, 1995). Other studies suggest that small firms have higher agency costs, a higher adverse selection cost of public financing (Smith, 1977) and prefer short-term loans, which means that the size and leverage of small firms may be negatively related.

Lagroe is lagged return on equity. Financing order theory (Myers, 1984; Myers and Majluf, 1984) suggests that due to asymmetric information and transaction costs, firms prefer retained earnings when sourcing capital. Thus, a firm's current profitability is important in measuring capital structure and a firm with higher earnings quality has less loans. However, trade-off theory suggests that when the marginal cost (bankruptcy costs and agency costs between shareholders and creditors) is equal to the marginal revenue (tax shields to decrease the constraints of cash flow and the information cost relative to equity financing) of debt financing, the firm maximizes its value and a firm with a higher profitability has more loans. Gonzalez and Gonzalez (2008) state that in countries with weak property rights protection, firms face higher external financing costs and follow financing order theory, although trade-off theory is more suitable in countries with good property rights protection.

Laglev is the lagged ratio of debt to total assets. Morris (1992) finds that long-term loans help firms to postpone bankruptcy, thus overleveraged firms prefer long-term loans. Stohs and Mauer (1996) suggest that a high ratio of long-term loans helps to increase a firm's value. Leland and Toft (1996) show that a firm's leverage depends on its debt maturity, where firms with a lower asset–liability ratio access short-term loans more easily. Dennis et al. (2000) found that a firm's leverage has a close relationship with debt maturity. Others studies find that firms with a lower asset–liability ratio have to pay more cash in the future and face higher liquidity risk.

Laggrow is the lagged sales growth rate. A firm with higher growth opportunities has more flexibility in its future investment, and managers may choose investment projects that benefit shareholders but harm creditors.

Table 1
Variable definitions.

Variable	Definition
Dls	Difference between the closing and initial short-term loan balances divided by total assets
Dll	Difference between the closing and initial long-term loan balances plus long-term loans of a maturity of less than 1 year divided by total assets
Dlt	The sum of Dls and Dll
Soe	A dummy variable that is coded 0 if the company is a state-owned enterprise, and 1 if the company is a non-state-owned enterprise
Eq	The negative standard deviation of firm *i*'s estimated residuals from a regression of current accruals on lagged, current and future cash flows from operations
Rerform	A dummy variable that is coded 0 if an observation occurs in the period 2001–2003 and 1 if it is in the period 2005–2009
Exdep	The difference between current capital expenditure and lagged operating cash flow divided by average total assets
Lagsize	Natural log of firm *i*'s lagged total assets
Lagroe	Lagged return on equity
Laglev	Lagged ratio of debt to total assets
Laggrow	Lagged sales growth rate
Lagfix	Lagged ratio of fixed assets to total assets
Indus1	A dummy variable that is coded 1 if a company belongs to the public utilities industry and 0 otherwise
Indus2	A dummy variable that is coded 1 if a company belongs to the real estate industry and 0 otherwise
Indus3	A dummy variable that is coded 1 if a company belongs to a comprehensive industry and 0 otherwise
Indus4	A dummy variable that is coded 1 if a company belongs to an industrial industry and 0 otherwise
Distr1	A dummy variable that is coded 1 if a company is located in northern China and 0 otherwise
Distr2	A dummy variable that is coded 1 if a company is located in northeastern China and 0 otherwise
Distr3	A dummy variable that is coded 1 if a company is located in central China and 0 otherwise
Distr4	A dummy variable that is coded 1 if a company is located in eastern China and 0 otherwise
Distr5	A dummy variable that is coded 1 if a company is located in southern China and 0 otherwise

Table 2
Descriptive statistics before and after financial reform.

	Pre-reform		Post-reform		*T*-test		Wilcoxon	
	Mean	Median	Mean	Median				
Dls	0.0199	0.0145	−0.0121	0.0000	−8.41	<.0001	−11.70	0.0000
Dll	0.0196	0.0000	0.0211	0.0000	0.61	0.5429	0.09	0.9266
Dlt	0.0395	0.0306	0.0092	0.0029	−6.03	<.0001	−9.60	0.0000
Eq	−0.0518	−0.0262	−0.0592	−0.0298	−2.85	0.0044	−2.54	0.0110
Exdep	−0.0249	−0.0258	−0.0363	−0.0413	−1.36	0.1732	−4.34	0.0000
Lagsize	20.9218	20.8928	21.2871	21.3073	11.98	<.0001	13.02	0.0000
Lagroe	0.0009	0.0641	0.0316	0.0533	0.38	0.7060	−0.93	0.3530
Laglev	0.5054	0.4751	0.6803	0.5536	4.38	<.0001	12.20	0.0000
Laggrow	0.0672	0.0410	0.0302	0.0559	−0.96	0.3374	2.83	0.0046
Lagfix	0.3329	0.3121	0.3229	0.2965	−1.78	0.0748	−2.59	0.0097
N	1735	1735	3382	3382				

Table 3
Descriptive statistics for state-owned and non-state-owned enterprises before and after the financial reform.

	Non-state-owned		State-owned		*T*-test		Wilcoxon	
	Mean	Median	Mean	Median				
Panel A: Descriptive statistics before the financial reform								
Dls	0.0235	0.0643	0.0197	0.0228	−0.56	0.5746	−2.25	0.0248
Dll	0.0248	0.0000	0.0194	0.0000	−1.35	0.1762	−0.21	0.8300
Dlt	0.0483	0.0285	0.0391	0.0429	−1.17	0.2415	−2.59	0.0096
Eq	−0.0746	−0.0239	−0.0436	−0.0355	7.11	<.0001	7.49	0.0000
Exdep	−0.0265	−0.0263	−0.0229	−0.0234	0.40	0.6860	−0.42	0.6753
Lagsize	20.4776	21.0083	21.0630	20.5215	12.52	<.0001	11.80	0.0000
Lagroe	−0.0461	0.0641	0.0271	0.0614	0.77	0.4419	1.12	0.2631
Laglev	0.5549	0.4583	0.4797	0.5167	−3.80	0.0002	−4.99	0.0000
Laggrow	0.0514	0.0453	0.0707	0.0268	1.42	0.1547	2.94	0.0033
Lagfix	0.2983	0.3298	0.3489	0.2726	5.02	<.0001	5.01	0.0000
N	448		1287					
Panel B: Descriptive statistics after the financial reform								
Dls	−0.0387	−0.0005	−0.0005	0.0000	7.34	<.0001	6.97	<.0001
Dll	0.0177	0.0000	0.0231	0.0000	1.48	0.1399	1.27	0.1016
Dlt	−0.0204	0.0000	0.0225	0.0101	5.98	<.0001	4.98	<.0001
Eq	−0.0866	−0.0358	−0.0476	−0.0245	11.15	<.0001	11.14	<.0001
Exdep	−0.0549	0.6839	−0.0268	0.5436	2.17	0.0302	−1.55	0.0603
Lagsize	20.6747	20.9211	21.5328	21.4864	2.72	0.0065	19.44	<.0001
Lagroe	−0.0522	0.0588	0.0650	0.0575	21.03	<.0001	−2.97	0.0015
Laglev	0.9746	0.5391	0.5683	0.5326	−0.93	0.3507	−9.14	<.0001
Laggrow	−0.0278	0.0590	0.0530	0.0692	6.29	<.0001	7.69	<.0001
Lagfix	0.2765	0.2681	0.3468	0.3248	1.28	0.2012	9.12	<.0001
N	957		2425					

Myers (1984) suggests that firms borrow short-term loans to reduce agency costs, thus short-term loans will be positively related to growth and long-term loans will be negatively related to investment. However, Titman and Wessels (1988) consider that growth is the added value of firm's assets and cannot be collateral or create tax revenue.

Lagfix is the lagged ratio of fixed assets to total assets. Scott (1972) and Myers and Majluf (1984) suggest that managers may benefit from selling collateral and the more managers can use collateral assets, the more opportunistic their behavior. Jensen and Meckling (1976) and Myers (1977) suggest that in a firm with higher leverage, managers are more likely to invest in projects that may harm creditors. Collateral helps to restrict borrowers from investing in higher risk projects and manager's non-pecuniary compensation demands may lead to a positive relationship between collateral and debt levels.

Table 4
Impact of the banking system reform on loan allocation.

	Dls	Dll	Dlt
Intercept	−0.0427	−0.0603**	−0.1030**
	(−1.14)	(−2.33)	(−2.12)
Eq	0.0784**	−0.0689***	0.0095
	(2.10)	(−2.65)	(0.19)
Reform	−0.0217***	0.0048	−0.0170***
	(−4.97)	(1.57)	(−2.98)
Eq ∗ reform	0.0806*	0.0596**	0.1402**
	(1.86)	(1.98)	(2.49)
Exdep	0.1591***	0.1114***	0.2705***
	(18.36)	(18.50)	(24.01)
Lagsize	0.0032*	0.0033***	0.0065***
	(1.81)	(2.68)	(2.83)
Lagroe	0.0002	−0.0001	0.0001
	(0.34)	(−0.33)	(0.09)
Laglev	−0.0212***	0.0008	−0.0204***
	(−16.12)	(0.92)	(−11.91)
Laggrow	0.0254***	0.0175***	0.0429***
	(13.53)	(13.38)	(17.56)
Lagfix	0.0346***	0.0300***	0.0647***
	(3.85)	(4.80)	(5.53)
Distr	Yes	Yes	Yes
Indus	Yes	Yes	Yes
Adj *R*-Sq	0.1787	0.0682	0.1786
F	87.04***	29.97***	87.03***
N	5117	5117	5117

The *T*-statistics are in parentheses.
* Significance at the 1% level.
** Significance at the 5% level.
*** Significance at the 10% level.

Following the literature, we also include year and industry dummies, and the district corruption index (Xie and Lu, 2005)[6] as control variables. Table 1 presents the definitions of the variables.

3.3. Descriptive statistics

Table 2 reports descriptive statistics for the variables in the analysis before and after the financial reform. The mean and median values of new short-term loans (Dls) decrease significantly after the financial reform. The mean value of Dls decreases from 0.0199 to −0.0121, and the median value decreases from 0.0145 to 0. The mean and median values of new long-term loans (Dll) also decrease after the financial reform, with the median value decreasing significantly. Influenced by new short-term loans and new long-term loans, the mean and median values of new total loans also decrease significantly after the financial reform.

After the reform, the mean and median values of earnings quality (Eq) decrease significantly from −0.0518 and −0.0262 to −0.0592 and −0.0298, respectively. The mean and median values of external financial dependence (Exdep) decrease significantly from −0.0249 and −0.0258 to −0.0363 and −0.0413, respectively. After the reform, size and leverage are significantly higher and growth and fixed assets are significantly lower. These statistical results indicate that after the reform, the external financing of firms was significantly lower, with fewer loans, especially short-term loans. This indicates that short-term loans are more vulnerable to the impact of external environmental fluctuations.

Table 3 reports the descriptive statistics for the variables for state-owned and non-state-owned enterprises before and after the financial reform. Panel A reports the descriptive statistics before the reform and Panel B

[6] The National Banking corruption index is 4.17. The index for northern China is 4.97, for western China is 4.71, for central China is 4.39, for southern China is 4.05, for northeastern China is 3.70 and for eastern China is 3.07 (Xie and Lu, 2005).

reports the descriptive statistics after the reform. Before the reform, the mean and median values of new short-term loans (Dls) for state-owned enterprises are significantly lower than for non-state-owned enterprises. The values of new long-term loans and new total loans for state-owned enterprises are also lower than that for non-state-owned enterprises. This statistical result indicates that before the reform, short-term loans and long-term loans were complementary. The mean and median values of earnings quality (Eq) of state-owned enterprises are significantly higher than those of non-state-owned enterprises. There is an insignificant difference in the external financial dependence (Exdep) of state-owned and non-state-owned enterprises.

Post-reform, the values of new short-term loans and new total loans of state-owned enterprises is significantly higher than that of non-state-owned enterprises. There is an insignificant difference in long-term loans between state-owned and non-state-owned enterprises, which means that soft budget constraints are still in force after the reform. The mean and median values of earnings quality (Eq) of state-owned enterprises are still significantly higher than those of non-state-owned enterprises. There is still an insignificant difference in the external financial dependence (Exdep) of state-owned and non-state-owned enterprises. This result indicates that the earnings quality of state-owned enterprises is significantly higher during 2001–2009 than that of non-state-owned enterprises, and thus the reform has significantly improved the short-term credit market.

4. Results

4.1. Impact of the banking system reform on loan allocation

We use model (1) to analyze the variance in the impact of earnings quality on loan allocation between state-owned enterprises and non-state-owned enterprises:

Table 5
Impact of the banking system reform on loan allocation to state-owned enterprises.

	Dls	Dll	Dlt
Intercept	−0.0604*	−0.0780***	−0.1384***
	(−1.77)	(−3.02)	(−3.23)
Eq	0.0438	−0.1109***	−0.0671
	(1.06)	(−3.53)	(−1.29)
Reform	−0.0134***	0.0057*	−0.0077
	(−3.41)	(1.92)	(−1.56)
Eq ∗ reform	0.1541***	0.0701*	0.2242***
	(3.23)	(1.94)	(3.75)
Exdep	0.1267***	0.1457***	0.2724***
	(13.62)	(20.69)	(23.37)
Lagsize	0.0034**	0.0036***	0.0070***
	(2.10)	(2.97)	(3.47)
Lagroe	−0.0003	0.0013**	0.0011
	(−0.37)	(2.52)	(1.22)
Laglev	−0.0111***	0.0019	−0.0092***
	(−5.37)	(1.20)	(−3.55)
Laggrow	0.0238***	0.0272***	0.0510***
	(11.70)	(17.62)	(19.98)
Lagfix	0.0418***	0.0454***	0.0872***
	(5.28)	(7.59)	(8.80)
Distr	Yes	Yes	Yes
Indus	Yes	Yes	Yes
Adj *R*-Sq	0.1095	0.1164	0.1710
F	36.22***	38.87***	60.12***
N	3712	3712	3712

The *T*-statistics are in parentheses.
* Significance at the 1% level.
** Significance at the 5% level.
*** Significance at the 10% level.

Table 6
Impact of the banking system reform on loan allocation to non-state-owned enterprises.

	Dls	Dll	Dlt
Intercept	0.1428	0.0043	0.1471
	(1.34)	(0.06)	(1.04)
Eq	0.1624**	−0.0228	0.1396
	(2.21)	(−0.47)	(1.43)
Reform	−0.0401***	0.0020	−0.0381**
	(−3.36)	(0.25)	(−2.40)
Eq * reform	−0.0400	0.0434	0.0034
	(−0.47)	(0.77)	(0.03)
Exdep	0.3493***	0.1434***	0.4928***
	(15.25)	(9.45)	(16.20)
Lagsize	−0.0044	0.0013	−0.0030
	(−0.86)	(0.40)	(−0.45)
Lagroe	−0.0004	−0.0013*	−0.0017
	(−0.33)	(−1.82)	(−1.16)
Laglev	−0.0290***	−0.0019	−0.0308***
	(−13.18)	(−1.27)	(−10.56)
Laggrow	−0.0063	−0.0028	−0.0090
	(−1.35)	(−0.91)	(−1.47)
Lagfix	0.0294	0.0000	0.0294
	(1.13)	(0.00)	(0.85)
Distr	Yes	Yes	Yes
Indus	Yes	Yes	Yes
Adj *R*-Sq	0.2810	0.0622	0.2527
F	43.56***	8.22***	37.83***
N	1405	1405	1405

The *T*-statistics are in parentheses.
* Significance at the 1% level.
** Significance at the 5% level.
*** Significance at the 10% level.

$$\mathrm{Dls}(\mathrm{Dll}/\mathrm{Dlt}) = f(\mathrm{Eq}, \mathrm{Reform}, \mathrm{Eq} * \mathrm{Reform}, \mathrm{Exdep}, \mathrm{Lagsize}, \mathrm{Lagroe}, \mathrm{Laglev}, \mathrm{Laggrow}, \mathrm{Lagfix}, \mathrm{Distr}, \mathrm{Indus}) \quad (1)$$

Table 4 reports the results of model (1) testing the variance in the impact of earnings quality on loan allocation before and after the reform. We find that before the reform earnings quality has a significant positive influence on new short-term loans and a significant negative influence on new long-term loans, which due to the substitutability of soft budget constraints means that earnings quality has no significant influence on new total loans. After the reform, the strength of the positive relationship between earnings quality and loans increases. The results in Table 4 indicate that the banking system reform has improved the efficiency of financial resource allocation and that earnings quality has had an incremental influence on credit loans.

Table 5 reports the results of model (1) testing the impact of state-owned enterprises' earnings quality on loan allocation before and after the reform. After the reform, the positive relationship between the earnings quality of state-owned enterprises and new short-term loans, new long-term loans and new total loans is enhanced. The results in Table 5 indicate that the banking system reform has improved credit allocation and tightened budget constraints.

Table 6 reports the results of model (1) testing the impact of the earnings quality of non-state-owned enterprises on loan allocation before and after the reform. After the reform, the relationship between the earnings quality of non-state-owned enterprise and new short-term loans, new long-term loans and new total loans does not change significantly. Combined with the results in Table 5, the reform appears to have had a greater impact on state-owned enterprises than non-state-owned enterprises, which provides preliminary evidence to verify Hypothesis 2.

4.2. Impact of ownership on the effect of the banking system reform

To further analyze the impact of the banking system reform on financial resource allocation, we include the Soe ownership variable (equal to 1 for non-state-owned enterprises) in our model:

$$\mathrm{Dls(Dll/Dlt)} = f(\mathrm{Eq, Reform, Soe, Eq * Reform, Reform * Soe, Eq * Soe, Eq * Reform * Soe, Exdep, Lagsize, Lagroe, Laglev, Laggrow, Lagfix, Distr, Indus}) \quad (2)$$

Table 7 reports the impact of ownership on the effect of the banking system reform. When the ownership variable is included, the impact of the reform on credit resources becomes significantly negative and the post-reform impact of the interaction between earnings quality and ownership on short-term loans, long-term loans and total loans is −0.2, −0.0232, and −0.2233. This means that the effect of the banking system reform on earnings quality has been lower in non-state-owned enterprises than in state-owned enterprises. These results show that commercial banks and non-state-owned enterprises have not reduced their rent-seeking since the reform.

The foregoing results are reported with White-adjusted standard errors. We also conducted several additional tests. We repeated the tests using the Jones model (Jones, 1991), substituting earnings predictability

Table 7
Impact of ownership on the effect of the banking system reform.

	Dls	Dll	Dlt
Intercept	−0.0320	−0.0773***	−0.1093**
	(−0.82)	(−2.84)	(−2.15)
Eq	0.0239	−0.0965**	−0.0727
	(0.44)	(−2.55)	(−1.03)
Reform	−0.0107**	0.0055	−0.0052
	(−2.09)	(1.55)	(−0.78)
Soe	0.0196**	0.0112**	0.0307***
	(2.42)	(1.99)	(2.93)
Eq * reform	0.1743***	0.0647	0.2390***
	(2.83)	(1.51)	(2.98)
Reform * soe	−0.0370***	−0.0048	−0.0418***
	(−3.89)	(−0.73)	(−3.38)
Eq * soe	0.1256*	0.0594	0.1850**
	(1.75)	(1.19)	(1.99)
Eq * reform * soe	−0.2000**	−0.0232	−0.2233**
	(−2.57)	(−0.43)	(−2.20)
Exdep	0.1576***	0.1121***	0.2697***
	(18.18)	(18.59)	(23.92)
Lagsize	0.0025	0.0039***	0.0064***
	(1.35)	(3.08)	(2.69)
Lagroe	0.0002	−0.0001	0.0001
	(0.39)	(−0.34)	(0.12)
Laglev	−0.0217	0.0010	−0.0206***
	(−16.29)	(1.13)	(−11.92)
Laggrow	0.0250***	0.0176***	0.0427***
	(13.32)	(13.48)	(17.45)
Lagfix	0.0321***	0.0322***	0.0643***
	(3.54)	(5.10)	(5.44)
Distr	Yes	Yes	Yes
Indus	Yes	Yes	Yes
Adj *R*-Sq	0.181	0.069	0.1799
F	67.86***	23.40***	67.35***
N	5117	5117	5117

The *T*-statistics are in parentheses.
* Significance at the 1% level.
** Significance at the 5% level.
*** Significance at the 10% level.

(Lev, 1983; Ali and Zarowin, 1992; Francis et al., 2002) for earnings quality, using cash from borrowing from the cash-flow statement as total loans and using the sample year 2001 only. In addition, we repeated the tests using Tobin's Q to measure a firm's growth opportunities, ROA to measure a firm's profitability and the natural logarithm of total sales to measure size. The results do not change in any of these additional tests and we do not report them due to space limitations.

5. Conclusion

This paper investigates credit allocation before and after the 2003 banking system reform to analyze the interactive influence of government, commercial banks, state-owned enterprises and non-state-owned enterprises on credit allocation. We find that the banking system reform has enhanced the role of earnings quality in the credit markets and eased the budget constraints of state-owned enterprises. Further analysis implies that, due to the influence of rent-seeking, banks have relaxed the earnings requirements of non-state-owned listed companies.

The practical implication of these findings is that improving credit allocation efficiency is not a matter of a simple policy choice, but is the result of institutional design. In the long run, further research is needed on the game theory of government, commercial banks, state-owned enterprises and non-state-owned enterprises in light of the stock-liquidity reform and the deeper financial system reform, with a focus on the influence of government governance on credit allocation.

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References

Akerlof, George A., Romer, 1993. Looting: the economic underworld of bankruptcy for profit. Brookings Papers on Economic Activity 98/2, 1–60.

Ali, A., Zarowin, P., 1992. The role of earnings levels in annual earnings–returns studies. Journal of Accounting Research 30, 286–296.

Ang, J., Chua, J., McConnell, J., 1982. The administrative costs of corporate bankruptcy: a note. Journal of Finance 37 (March), 219–226.

Aoki, Okuno, 2005. Comparative Institutional Analysis of the Economic System. Chinese Development Publisher (in Chinese).

Berglof, Erik, Roland, Gerard, 1995. Soft budget constraints and credit crunches in financial transition. Journal of Japanese and International Economies 9, 354–375.

Brandt, L., Li, H., 2003. Bank discrimination in transition economics: ideology, information, or incentives? Journal of Comparative Economics 31, 387–413.

Chow, G.L., 2008. Earnings Quality and Cost of Capital. Ph.D. Thesis, Shanghai University of Finance (in Chinese).

Cull, R., Xu, L., 2005. Institutions, ownership, and finance: the determinants of profit reinvestment among Chinese firms. Journal of Financial Economics 77, 117–146.

Dechow, P., Dichev, I., 2002. The quality of accruals and earnings: the role of accrual estimation errors. Accounting Review 77 (Supplement), 35–59.

Dennis, S., Nandy, D., Sharpe, I.G., 2000. The determinants of contract terms in bank revolving credit agreements. Journal of Financial and Quantitative Analysis 35, 87–110.

Fang, J.X., 2010. Non SOEs: really facing banking lending discrimination? Management World 11, 123–131 (in Chinese).

Francis, J., LaFond, R., Olsson, P., Schipper, K., 2002. The Market Pricing of Earnings Quality. Working Paper, Duke University, University of Wisconsin and the FASB.

Francis, J., LaFond, R., Olsson, P., Schipper, K., 2003. Earnings Quality and the Pricing Effects of Earnings Patterns. Working Paper, Duke University, University of Wisconsin and the FASB.

Francis, J., Khurana, K., Pereira, R., 2005. Disclosure incentives and effects on cost of capital around the world. Accounting Review 80, 1125–1162.

Gao, S., Schaffer, M.E., 1998. Financial Discipline in the Enterprise Sector in Transition Countries: How Does China Compare? Center for Economic Reform and Transition Discussion Paper: 98/1, Heriott-Watt University, Edinburgh.

Gonzalez, Victor M., Gonzalez, Francisco, 2008. Influence of bank concentration and institutions on capital structure: new international evidence. Journal of Corporate Finance 4 (14), 363–375.
Gruber, M., Warner, J., 1977. Bankruptcy costs: some evidence. Journal of Finance 32, 337–347.
Jaffee, Dwight M., Russell, Thomas, 1976. The imperfect information, uncertainty, and credit rationing. The Quarterly Journal of Economics 90 (4), 651–666.
Jensen, M.C., Meckling, W., 1976. Theory of the firm: managerial behavior, agency costs and capital structure. Journal of Financial Economics 3, 305–360.
Jiang, W., Li, B., 2006. Institutional environment, state ownership and lending discrimination. China Financial Research 11, 116–126 (in Chinese).
Jones, J., 1991. Earnings management during import relief investigations. Journal of Accounting Research 29, 193–228.
Kornai, J., 1980. Economics of Shortage. Amsterdam, North Holland.
Kornai, János, Maskin, Eric, Roland, Gérard, 2003. Understanding the soft budget constraints. Journal of Economic Literature XLI, 1095–1136.
Leland, H.E., Toft, K.B., 1996. Optimal capital structure, endogenous bankruptcy, and the term structure of credit spreads. Journal of Finance 51, 987–1019.
Lev, B., 1983. Some economic determinants of the time-series properties of earnings. Journal of Accounting and Economics, 31–38.
Lin, Y.F., Cai, F., Li, Z., 1997. Full information and Reform of SOEs. Shanghai People's Publisher.
Lin,Y.F., Cai, Li, Z., 1994/1999 . Chinese Miracle:Development strategy and economic reform. Shanghai People's Publisher (1999 Revised Edition).
Lin, Y.F., Liu, M.X., Zhang, Q., 2004. Policy burden and enterprises' soft budgetary binding: a case study from China. Management World 8, 34–45 (in Chinese).
Morris, J.R., 1992. Factors Affecting the Maturity Structure of Corporate Debt. Working Paper, University of Colorado at Denver.
Myers, S., 1977. Determinants of corporate borrowing. Journal of Financial Economics 9, 147–176.
Myers, S., 1984. The capital structure puzzle. Journal of Finance 39, 575–592.
Myers, S., Majluf, N., 1984. Corporate financing and investment decisions when firms have information investors do not have. Journal of Financial Economics 13, 187–221.
Rajan, R.G., Zingales, L., 1995. What do we know about capital structure? Some evidence from international data. Journal of Finance 50 (5), 1421–1460.
Rajan, R., Zingales, L., 1998. Financial dependence and growth. American Economic Review 88, 559–586.
Scott, D., 1972. Evidence on the importance of financial structure. Financial Management 1, 45–50.
Smith, C., 1977. Alternative methods for raising capital: rights versus underwritten offerings. Journal of Financial Economics 5, 273–307.
Stohs, M.H., Mauer, D.C., 1996. The determinants of corporate debt maturity structure. Journal of Business 69, 279–312.
Sun, Z., Liu, F.W., Li, Z.Q., 2005. Market development, government influence and corporate debt maturity structure. Economic Research Journal 5, 52–63 (in Chinese).
Titman, S., Wessels, R., 1988. The determinants of capital structure choice. Journal of Finance 43, 1–19.
Williamson, Stephen D., 1986. Costly monitoring, financial intermediation, and equilibrium credit rationing. Journal of Monetary Economics 18, 159–179.
Wu, J., Bai, Y., 2009. The impact of China's banking reform on the soft budget constraint of SOEs. China Financial Research 10, 180–192.
Xie, P., Lu, L., 2005. The Economic Analysis of Chinese Financial Corruption. Zhongxing Publisher.
Xue, Y.K., Zhu, X.L., 2010. Institutional changes, earnings quality and debt contract empirical evidence from the Chinese banking system reform. China Accounting and Finance Review 3, 57–106 (in Chinese).
Zhang, M., Zhang, S., Sheng, H., Wang, C., 2010. Political connections and credit resource allocation efficiency. Management World 11, 143–153 (in Chinese).

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Internal corporate governance and the use of IPO over-financing: Evidence from China

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ABSTRACT

In this paper, we describe how Shenzhen A-share listed companies used funds raised in over-financed IPOs during the 2006–2010 period. In exploring the relationship between internal corporate governance and the use of funds raised in over-financed IPOs, we find that the use of such funds to engage in severe over-investment behavior is prevalent among listed companies. Reasonable internal corporate governance mechanisms can effectively alleviate over-investment problems listed companies encounter in using funds raised in over-financed IPOs. However, the same individual serving as both chairman and CEO leads to funds raised in over-financed IPOs being over-invested. Moreover, executives driven by high levels of monetary compensation are more likely to use funds raised in such IPOs to engage in over-investment. We find that improving the balance of power between shareholders will help alleviate the over-investment of excess IPO funds. In addition, the over-investment problem is less severe in state-controlled listed companies than in their non-state-controlled listed counterparts. This study provides policy recommendations for Chinese securities regulators to ensure listed companies use funds raised in over-financed IPOs both rationally and effectively.

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1. Introduction

Each year since its establishment in 1991, the Chinese capital market has hosted a considerable number of newly listed companies with over-financed IPOs, i.e. those where the amount of funds actually raised is greater than the size of the planned financing. As a phenomenon unique to China's capital market, IPO over-financing has become an important concern for the China Securities Regulatory Commission, China's domestic financial media and scholars alike. In addition, the frequent occurrence of over-financed IPOs in the newly established Growth Enterprises Market indicates that studying and resolving the IPO over-financing problem to enhance resource allocation efficiency in the Chinese capital market and maintain the healthy development of this new market is both important and urgent. Supervising and ensuring the rational use of funds listed companies raise in IPOs to protect the interests of general investors has recently become the focus of Chinese securities regulatory authorities.[1] Existing research fails to provide a clear explanation of how listed companies use funds raised in over-financed IPOs after meeting their established financing needs, whether listed companies misuse or waste such funds and whether they engage in over-investment and other types of behavior against the interests of investors when using the proceeds of over-subscribed IPOs. We consider these issues important and address them in this paper.

The question of how to use funds raised in over-subscribed IPOs in a reasonable and effective manner not only tests the business wisdom of listed company executives, but also examines their professional integrity. We consider that the use and investment of funds raised in over-financed IPOs among Chinese listed companies provide a natural setting for examining the relationship between internal corporate governance mechanisms and corporate investment decisions. It also provides a better environment for testing the effectiveness of internal corporate governance. There are two main reasons for this. First, the use and investment of the funds raised in over-financed IPOs more truly reflect the real motives of executives. The relevant provisions require that funds raised by a listed company through a public offering must be used for specific purposes in accordance with the applicable commitments in the prospectus.[2] However, the use of excess funds raised in such offerings is not subject to this rule. There is no commitment related to an established purpose and investment plan for funds raised in excess of the IPO target, and no problem would arise even if the investments for which such funds were used changed. Because excess funds raised in IPOs are essentially an extra source of finance given to the company by its shareholders when the company goes public, shareholders do not immediately require cash dividends from such capital, which is akin to manna from heaven. Therefore, listed companies can use this portion of additional funds as they wish. In addition, the huge amount of funds raised in over-financed IPOs also induces companies to engage in rapid investment and expansion. After meeting the funding needs of the enterprise's established investments, the listed company's executives are more likely to use funds raised in an over-financed IPO to further their own interests because of agency problems. Hence, the use and investment of excess funds raised in over-financed IPOs are more reflective of the real motives of executives. This provides us with a better opportunity to test the effect of internal corporate governance.

Second, analysis of the ways in which excess funds raised in over-financed IPOs are used may help us distinguish between firms that engage in distinct forms of over-investment. The public financing of enterprise investment projects is approved following rigorous discussion by the board of directors and at the shareholders meeting. In addition, Chinese financings are currently managed through an examination and approval system. The use of project financing funds is subject to stringent scrutiny by the China Securities Regulatory Commission (CSRC). Chinese enterprises are required to submit their prospectus to the issuance examination committee of the CSRC during the listing process. Investment projects are the focus of scrutiny by the CSRC issuance examination committee. In accordance with relevant laws and regulations, such as the Administrative Measures for Initial Public Offerings and Listings and the Interim Measures for the Administration of Initial

[1] For example, the Shenzhen Stock Exchange issued the "Memorandum on information disclosure business in GEM No.1 – the use of funds raised in IPO over-financings" in 2009 in response to the frequent occurrence of IPO over-financing in the newly established Growth Enterprises Market.

[2] It is noteworthy that Chinese listed companies have frequently changed the investment projects to which they are committed and seriously undermined the interests of small shareholders when using money raised through public offerings (Wang et al., 2011; Zhang and Zhai, 2005; Liu and Dai, 2004).

Public Offerings and Listings on the Growth Enterprises Market, funds raised should be used for the main business of the issuer and should be compatible with the issuer's existing scale of production operations, financial condition, level of technology and management capabilities, as well as being in line with laws, rules and regulations covering national industrial policy, investment management, environmental protection, land management and other matters. If the funds raised are not used in compliance with the IPO conditions, the application of the company to go public will be rejected by the CSRC.[3] Therefore, the IPO investment plan formed through the approval process should be relatively scientific and reasonable, and the size and purpose of IPO investment projects must comply with the requirements of appropriate regulations, as well as being closely aligned to the company's corporate investment and development needs over the next few years. However, if a listed company continues to use excess IPO funds to invest in projects outside the scope of the established investment plan, it is more likely to engage in over-investment, which will inevitably result in a decline in the rate of return on investment, thus providing us with a good opportunity to explore whether internal governance inhibits corporate over-investment.

We make a number of theoretical contributions to the literature in this paper. First, by targeting the IPO over-financing phenomenon unique to the emerging capital market of China, we explore agency problems experienced by listed companies using funds raised in over-financed IPOs. We find that most listed companies engage in severe over-investment when using excess IPO funds. This finding complements and expands free cash flow theory in the corporate finance literature. Second, listed companies with good internal corporate governance can effectively alleviate the over-investment problem, reduce over-investment in the use of funds raised in over-financed IPOs, and improve the efficiency with which such funds are used. This conclusion not only adds to our understanding of the role of corporate governance and expands our conception of the part played by corporate governance in emerging capital markets and improving investment efficiency, but also provides a basis for corresponding policy recommendations for Chinese securities regulators to ensure listed companies use funds raised in over-financed IPOs in a rational manner. Third, we extend the line of research examining how listed companies use and invest funds raised through public offerings. Previous studies of the domestic market in China show listed companies frequently change the investment projects to which they are committed and seriously undermine the interests of small shareholders in their use of money raised through public offerings. This type of behavior also occurs in the use of funds raised in over-financed IPOs, suggesting the use and investment of funds raised through public offerings must be closely governed.

The remainder of this paper is organized as follows. In Section 2, we outline our theoretical analysis and develop our hypotheses. Section 3 presents the research design and Section 4 provides the test results and empirical analysis. Additional checks are discussed in Section 5. Section 6 concludes the paper.

2. Theoretical analysis and hypotheses

The main function of the capital market is to optimize resource allocation and distribute funds among high-quality corporations requiring funds for development. However, the over-allocation of funds to good enterprises will also result in a low level of resource allocation efficiency in the capital market. Consequently, the over-financing of an enterprise implies the reduction and disappearance of financing opportunities for other enterprises that urgently need funding (Jiang and Li, 2010; Fang and Fang, 2010). The essence of the IPO over-financing phenomenon is the mismatch of resources in the Chinese capital market, reflecting its imperfections and poor investment channels. It is impossible to completely eliminate the over-financing problem in the short term without establishing efficient investment channels in China. Therefore, establishing a sound internal corporate governance mechanism is an effective way for listed companies to supervise and ensure the rational and proper use of funds raised in over-financed IPOs.

We have not yet established a clear picture of how Chinese listed companies make use of the funds they raise in over-financed IPOs or whether they act against the interests of investors in using such funds, which is one focus of this study. Agency theory indicates that due to the separation of ownership and management,

[3] For example, Shanghai Chaori Solar Energy Science & Technology Co., Ltd. and Beijing Fuxing Xiaocheng Electronic Technology Stock Co., Ltd. both had their IPO applications rejected by the CSRC in recent years because their use of the funds raised did not comply with the IPO conditions.

managers of modern enterprises will deviate from the interests of shareholders and engage in self-serving practices. Managers of enterprises with substantial free cash flows tend to become involved in activities contrary to the interests of shareholders, such as awarding themselves perks, over-investment and empire building (Jensen and Meckling, 1976; Jensen, 1986). Jensen (1986) found that in the late 1970s and early 1980s, the excess-capacity US oil and tobacco industries became involved in over-investment due to agency problems, blindly expanding the scope of their business and affecting the interests of investors instead of returning surplus cash flows to them via cash dividends. Lamont (1997) and Ghose (2005) come to similar conclusions in later studies. Focusing on US oil companies, they find the level of over-investment is directly related to the amount of cash available to managers. Therefore, enterprises need a corresponding internal governance mechanism to align the interests of managers and shareholders, to supervise and motivate managers and to reduce principal-agent costs (Jensen and Meckling, 1976; Eisenhardt, 1988; Shleifer and Vishny, 1997).

We consider that given China's status as an emerging economy, the IPO over-financing phenomenon unique to the Chinese capital market has some similarities to the free cash flow problem of Jensen (1986).[4] Where basic financing needs are satisfied, listed companies with excess IPO funds provided by investors are more likely to engage in over-investment and misuse or waste such funds because of agency problems, thereby resulting in the inefficient use of enterprise funds and damaging the interests of shareholders. Chinese listed companies that raise excess funds in IPOs currently provide a natural population for examining the relationship between internal corporate governance mechanisms and corporate investment decisions, and for testing the effectiveness of internal corporate governance in a more rigorous fashion. The use and investment of funds raised in over-financed IPOs more truly reflect the real motives of executives. Excess IPO funds are not subject to any commitment related to an established purpose and investment plans, and no problem would arise even if the projects in which such funds were invested changed. Therefore, listed companies can use this source of additional funds as they please. After meeting the funding needs of the enterprise's established investments, the listed company's executives are more likely to use IPO funds left over to further their own interests because of agency problems. In addition, the huge amount of funds raised in over-financed IPOs will also induce companies to engage rapidly in investment and expansion. A typical case is that of the company Beijing Lier High-Temperature Materials Co., Ltd. (002392)[5] listed on the Shenzhen SME Board. In circumstances where the industry was contracting and there were a lack of good investment opportunities, Beijing Lier misused the funds it raised and embarked on a counter-cyclical expansion program in September 2010, blindly investing in a technology line that had been taken out of production and seriously damaging the interests of investors as a result.

Jensen (1993) argues that managers generally have an impulse to over-invest because they can obtain more private benefits by controlling more resources such as perks, which are often positively related to the size of the company, and that managers have the motivation to expand the scale of business investments. Jensen and Meckling (1976) considered that giving managers corresponding incentives to reduce their opportunistic behavior can reduce agency conflicts to realize the maximization of enterprise value. Morck et al. (1988) find that self-serving managers who hold fewer shares in the company will exacerbate conflicts of interest between

[4] Although the IPO over-financing phenomenon unique to the Chinese capital market has some similarities to the free cash flow problem referred to by Jensen, there are some major differences between them. First, excess funds raised in IPOs and free cash flows come from different sources. Free cash flows are generated by corporations which have survived for a long time and are the result of many years of production and operation. However, this is not the case for excess funds raised in IPOs, as they are not generated by the corporation's production and operating activities. Excess funds raised in an IPO are essentially an extra portion of capital given to the company by its shareholders when the company goes public, and is akin to manna from heaven. Second, whether excess IPO funds and free cash flows should be paid back to shareholders through cash dividends involves different considerations for these two sources of funds. Excess IPO funds are an extra portion of capital given to the company by its shareholders, who require no immediate cash dividends in return. However, this is not the case for free cash flow. Jensen (1986) argued that free cash flow should be returned to shareholders as soon as possible in the form of cash dividends to reduce agency problems such as empire building, diversification and mergers and acquisitions. Third, while excess IPO funds are easily identified, this is not so for free cash flow. Although Jensen (1986) clearly defines free cash flow as cash flow in excess of that required to fund all projects that have positive net present values when discounted at the cost of capital, this definition cannot be implemented in practice because outsiders have no way of knowing which of the enterprise's investment projects have a positive NPV. Therefore, it is difficult to judge whether an enterprise has free cash flow, and if so, the amount of free cash flow. However, funds raised in over-financed IPOs are easy to recognize.

[5] This information is sourced from www.wlstock.com (http://hudong.wlstock.com/StockBar/d7934732.aspx).

managers and outside shareholders. With higher managerial ownership, managers have a greater share of residual income, thus incentivizing them to focus on the long-term performance of the enterprise and exerting a convergence effect. Hall and Liebman (1998) point out in a study of US listed companies that in comparison with wages, bonuses and other forms of compensation, equity incentives are an effective incentive tool. Therefore, managerial ownership can reduce the conflict between the interests of shareholders and effectively reduce agency costs. Subsequent research has also shown that equity incentives can improve the efficiency of investment, inhibit managers from engaging in myopic behavior (Balkin et al., 2000; Tang et al., 2011) and reduce over-investment (Broussard et al., 2004).

Studies based on China's domestic market have found that managers of listed companies also have a tendency to over-invest and that this kind of over-investment leads to less efficient investments that damage firm value (Wei and Liu, 2007). Given the lack of financing constraints and securities market mechanisms in China's capital market as the country goes through a period of economic transition, listed companies lack constraints on their integrity (Liu and Dai, 2004). Moreover, information asymmetry in investment projects exacerbates opportunistic behavior among managers and promotes their misuse of funds raised in over-financed IPOs to engage in over-investment. As yet, we lack a clear understanding of whether managers granted stock option incentives use excess funds raised in IPOs in a reasonable and effective manner based on the investment opportunities available. Therefore, we propose Hypothesis 1 as follows:

Hypothesis 1. The higher the proportion of equity incentives granted to executives, the greater the extent to which they alleviate the over-investment of funds raised in over-financed IPOs.

Jensen and Murphy (1990) argue that a well-designed compensation contract is an important mechanism enabling the company to converge the interests of managers and shareholders. Enterprises motivate executives in various ways. One of the methods most commonly adopted is monetary compensation contracts. Monetary compensation contracts set out how much the enterprise may pay an executive during the contract period (Chen et al., 2010). Compensation contracts that do not incentivize managers to work hard and compensate them for doing so are likely to cause opportunistic behavior among managers. In comparison with equity incentives, monetary rewards exert an incentive effect within a short period and tie compensation more closely to the current efforts of managers.

Studies conducted to date are not unanimous on whether monetary compensation plays a role in inspiring the managers of Chinese enterprises. Wei (2000) and Li (2000) find that monetary compensation paid to managers does not play an incentivizing role in China, showing the performance of Chinese listed companies is not positively related to managers' annual pay. However, the empirical evidence of Liu et al. (2003) and Zhang et al. (2003) shows that monetary rewards have an incentivizing effect to some degree, demonstrating firm performance has a significant positive relationship with monetary rewards paid to managers. However, the effect of managerial monetary compensation on over-investment among enterprises remains an untested empirical question.

Xin et al. (2007) point out that managers who can obtain large private benefits from corporate investment projects are more likely to accept investment projects with a negative net present value and that setting monetary compensation too low will cause managers to engage in over-investment, thereby seriously damaging the wealth of shareholders. Executives with higher monetary rewards are likely to engage in myopic behavior because they are insufficiently incentivized and have a greater likelihood of directly misusing excess funds raised in IPOs to over-invest and obtain private benefits. Based on this discussion, we propose Hypothesis 2 as follows:

Hypothesis 2. The greater the monetary rewards paid to executives, the more likely they use funds raised in over-financed IPOs to engage in over-investment.

Jensen (1993) argues that the function of the chairman is to run board meetings and oversee the process of hiring, firing, evaluating and compensating the CEO. Clearly, the CEO cannot perform this function in isolation from their personal interest. Without the direction of an independent leader, it is much more difficult for the board to perform its critical functions. Therefore, the corresponding internal control systems of the enterprise will be ineffective. Fama and Jensen (1983) and Jensen (1993) argue that the separation of the chair-

man and CEO roles allows the board to monitor the CEO more effectively, thus reducing agency costs, whereas having the CEO also serve as chairman of the board may result in higher agency costs. Based on this discussion, we propose Hypothesis 3 as follows:

Hypothesis 3. CEO duality leads to the over-investment of funds raised in over-financed IPOs.

Cronqvist and Fahlenbrach (2009) find that the largest shareholder has an influence on investment, financing, executive compensation and other company policies. Using a theoretical model, Shleifer and Vishny (1986) point out that the existence of large shareholders and concentrated ownership can reduce managers' opportunistic behavior, can partially solve the free-rider problem of small and medium-sized shareholders, and can alleviate agency conflicts between shareholders and managers. However, Shleifer and Vishny (1997) argue that most agency costs in some emerging countries come from conflicts of interest between controlling shareholders and small shareholders rather than from conflicts of interest between managers and dispersed shareholders.

Based on their investigation of the phenomenon whereby Chinese listed companies frequently change the projects to which money raised through public offerings is committed, Zhang and Zhai (2005) show that the probability and degree of these changes is significantly negatively related to ownership concentration. This means that large shareholders of listed companies in China determine how the interests of small shareholders are served by controlling how funds raised are used. In addition, Chen and Chen (2005) find that the use of IPO proceeds was influenced by the agency problems of large shareholders and that the largest shareholder controlled the proceeds of listed company IPOs. Therefore, governance mechanisms are needed to curb the behavior of large shareholders and prevent them from acting against the interests of small shareholders.

The theoretical literature suggests that balanced ownership is an effective internal corporate governance mechanism and that ownership checks and balances can to some extent inhibit large shareholders from acting against the interests of small shareholders and improve firm performance (Shleifer and Vishny, 1986; La Porta et al., 1999). If the company has more than one large shareholder, the behavior of the largest shareholder can be restricted and the interests of other shareholders can be upheld. Due to the improvement brought about by balanced ownership, checks and balances between multiple large shareholders can limit the misappropriation of private benefits of control (Zhu and Wang, 2004; Tu and Liu, 2010) and increase the time and energy directed toward the supervision of managers so they dare not over-invest. Based on the above theoretical predictions, mutual checks and balances among the largest shareholders to some extent influence the use and investment of funds raised in IPOs. However, empirical evidence pointing to whether such checks and balances between large shareholders can inhibit the misuse of excess IPO funds to engage in over-investment is still lacking. Based on this discussion, we propose Hypothesis 4 as follows:

Hypothesis 4. The more even the balance of power between shareholders, the greater the extent to which they alleviate the over-investment of funds raised in over-financed IPOs.

3. Research design

3.1. Sample selection and data sources

Since 2005, the Chinese capital market has experienced the split-share structure reform, the implementation of an IPO inquiry system and the promulgation of provisions on the use of funds raised by listed companies. Given this background, we select as the sample for this study companies listed on the A-share section of the Shenzhen Stock Exchange that launched over-financed IPOs in the 2006–2010 period. The first reason we consider the Shenzhen market only is that only 31 companies listed on the Shanghai Stock Exchange had over-subscribed IPOs in the same period and no specific disclosures on the use of excess funds raised by such companies can be found. The second reason is that the listing rules and information disclosure system of the Shenzhen Stock Exchange are stricter than those of its Shanghai counterpart and information disclosed on the use of excess funds raised by Shenzhen listed companies is more complete. A total of 542 Shenzhen-listed companies launched over-financed IPOs in the 2006–2010 period, of which 170 did not make disclosures on their use of excess funds. After excluding missing data, we have a final sample comprising 372 firm-year

observations. Among these observations, 27, 30, 21, 56 and 238 are for each of the years from 2006 to 2010 respectively. Financial and corporate governance data are obtained from the China Stock Market and Accounting Research (CSMAR) Database.

3.2. The use and investment of funds raised in over-financed IPOs

Data regarding the use and investment of funds raised in over-financed IPOs are drawn from "Assurance reports on the annual use and storage of raised funds", "Independent opinions of independent directors on the plan to use excess funds raised", "Announcements on the use of some of the funds raised in over-financed IPOs to repay bank loans and add liquidity" and other publicly available information. We manually collect data on the use of funds raised in over-financed IPOs. Funds raised in over-financed IPOs are invested for purposes including the following: add liquidity, set up subsidiaries, mergers and acquisitions, purchase plant, construct self-built buildings and plant, purchase land and real estate, purchase office space, pay back bank loans, investment in subsidiaries, investment projects and construction projects, capital increase, overseas investment, deposit in dedicated account, working capital related to the main business, advertising, marketing services network construction, expansion of headquarters R&D center, investment in the main business and not disclosed.

According to the relevant requirements of the "Memorandum on information disclosure business of GEM No. 1 – the use of funds raised in over-financed IPOs" promulgated by the Shenzhen Stock Exchange: (1) funds raised in over-financed IPOs should be deposited in a dedicated account; (2) funds raised in over-financed IPOs should be used for the main business of the company and should not be used for securities investment, trust management, derivatives investment, venture capital or other high-risk investments, or to provide financial assistance to others; (3) the amount of funds raised in an over-financed IPO to permanently add liquidity and repay bank loans should not exceed 20% of the total amount of funds raised every 12 months; and (4) the use of funds raised in an over-financed IPO to temporarily add liquidity is to be regarded as the same as using idle funds raised funds to temporarily add liquidity. Therefore, adding liquidity, paying back bank loans, making deposits in a dedicated account and other working capital accounts related to the main business are classified as non-capital investments. That is, they constitute projects that only maintain value and cannot add value, while other projects are classified as capital investments.

3.3. Model specification and variable definitions

In this paper, we study the effect of executive ownership incentives, monetary compensation paid to executives, CEO duality and the balance of power between shareholders on the over-investment of funds raised in over-financed IPOs. We follow prior literature in selecting the corresponding control variables. Based on data on Chinese listed companies, Wei and Liu (2007) find that the better the firm performs and the stronger its profitability (EPS), the greater the possibility of over-investment. In addition, investment opportunities (Tobin's q) have a far-reaching influence on the investment behavior of enterprises (Broussard et al., 2004; Richardson, 2006; Wei and Liu, 2007; Xin et al., 2007; Tang et al., 2010). Previous studies point out that corporate over-investment is related to ineffective corporate governance (Wei and Liu, 2007; Xin et al., 2007). Yu et al. (2010) and Qin (2010) further find that independent directors can play a supervisory role to a certain extent and that the higher the proportion of independent directors, the more the board can inhibit over-investment. However, the empirical evidence of Luo et al. (2012), Tang et al. (2010) and Liu (2006) shows that Chinese independent directors do not yet play a significant role in the restraint of corporate over-investment. Although some studies point out that a reasonable board size is an assurance that the enterprise is highly efficient (Yermack, 1996), there is no unanimous conclusion on the relationship between board size and corporate over-investment in China. Qin (2010) finds that board size is significantly negatively correlated with over-investment. However, Luo et al. (2012) point out there is no clear relationship between them. Other studies demonstrate that in comparison with private enterprises, state-owned enterprises engage in more serious over-investment (Yu et al., 2010; Qin, 2010; Luo et al., 2012). Therefore, we select as our control variables the investment opportunities of the firm (Tobin's q), firm performance (EPS), nature of the controlling owner (Control), proportion of independent directors (Dirp), board size (Dirsize), year effects (Year) and industry

effects (Industry), and build the following model. The definitions of the main variables are presented in Table 1.

$$OI_{t+1} = \alpha_0 + \alpha_1 Stock_t + \alpha_2 Lpay_t + \alpha_3 Dual_t + \alpha_4 Dirp_t + \alpha_5 Dirsize_t + \alpha_6 Z_t + \alpha_7 Eps_t + \alpha_8 Control_t + \sum_{i=1}^{m} \alpha_{8+i} Year + \sum_{i=1}^{n} \alpha_{8+m+i} Industry + \varepsilon$$

$$OF_{t+1} = \alpha_0 + \alpha_1 Stock_t + \alpha_2 Lpay_t + \alpha_3 Dual_t + \alpha_4 Dirp_t + \alpha_5 Dirsize_t + \alpha_6 Z_t + \alpha_7 Eps_t + \alpha_8 Control_t + \sum_{i=1}^{m} \alpha_{8+i} Year + \sum_{i=1}^{n} \alpha_{8+m+i} Industry + \varepsilon$$

The empirical logic we follow in this paper includes the following three steps: first, if the company uses excess IPO funds for non-capital investment projects, its retention of idle funds means it is more likely to wait for better investment opportunities in the future and participate in investment projects with an NPV greater than zero. It can maintain the value of the funds raised while holding them in custody and at least help alleviate the agency problems it faces. Second, if the enterprise uses funds raised in an over-financed IPO for capital investments, we need to undertake a specific analysis of whether such capital investments constitute over-investment. The key measure of over-investment is to investigate the investment purposes of the enterprise's capital investments. We use investment opportunities to determine whether a capital investment represents over-investment. If the enterprise has good investment opportunities in comparison with those available in its industry and uses excess IPO funds to make investments that maintain and add value, such capital investments do not constitute over-investment. In contrast, if the enterprise does not have good investment opportunities relative to those in its industry and uses excess IPO funds to make investments, the capital investments represent over-investment increasing the agency costs of the enterprise. Third, we investigate what internal corporate governance mechanisms are effective in suppressing over-investment in capital projects.

4. Empirical results

4.1. Descriptive statistics

Table 2 shows that the average proportion of sample companies that use funds raised in over-financed IPOs for capital investments (RI) is 0.3631. In addition, the descriptive statistics in Table 3 indicate that the proportion of sample companies that use excess IPO funds to add liquidity, make deposits in dedicated accounts or participate in other non-capital investment projects is 46.49%, with the remaining 53.51% using such funds for capital investment projects. As much as 54.84% of all non-capital investment projects are used to add liquidity, with 44.89% being used to pay back bank loans. The largest category of capital investments is investment projects and construction projects, accounting for 56.10%, followed by mergers and acquisitions (15.12%), setting up subsidiaries (11.68%) and investment in subsidiaries (10.67%). It should be noted that 170 listed companies did not disclose any details of their investment of excess IPO funds.

We further analyze how Shenzhen A-share listed companies have used funds raised in over-financed IPOs by year. Table 4 reports the corresponding data. We find that the number of listed companies raising excess funds in IPOs is small for the 2006–2008 period. Even listed companies that raised funds in over-financed IPOs used such funds to add liquidity and rarely made capital investments in any form. However, in 2009 and 2010, listed companies used excess IPO funds for various forms of capital investment, indicating agency problems became increasingly serious in the Chinese capital market in those two years. In our view, the major reason may be that the Chinese government has since 2008 put 4 trillion yuan into the market to expand domestic demand and stimulate economic growth. Thus, the over-investment problem is becoming more serious under the influence of excess liquidity.

Table 5 shows that in comparison with state-owned enterprises, non-state-owned enterprises are more likely to make capital investments. In addition, state-controlled listed companies tend to concentrate their capital investments in investment projects and construction projects, mergers and acquisitions and setting up subsidiaries, having no involvement in the other categories of capital investment. However, non-state-controlled

Table 1
Definitions of variables.

	Variable	Symbol	Definition
Dependent variables	Capital investment	RI	Capital investment of funds raised in over-financed IPO of listed company/(capital investment of funds raised in over-financed IPO + non-capital investment of funds raised in over-financed IPO)
		OI	Over-investment proportion of funds raised in over-financed IPO, that is, OI = capital investment of funds raised in over-financed IPO of listed company/(capital investment of funds raised in over-financed IPO + non-capital investment of funds raised in over-financed IPO) when Tobin's $q <$ industry average value or Ppa < industry average value
		RF	Capital investment of funds raised in over-financed IPO of listed company/total assets at year-end
		OF	Over-investment proportion of funds raised in over-financed IPO, that is, OF = capital investment of funds raised in over-financed IPO of listed company $*$ 100/total assets at year-end when Tobin's $q <$ industry average value or Ppa < industry average value
	Return on long-term capital	ROLC	ROLC = (total profit + financial expenses)/long-term capital = 2 (total profit + financial expenses)/(long-term liabilities at beginning of year + long-term liabilities at year-end) + (equity at beginning of year + equity at year-end)
Explanatory variables	Equity incentives of executives	Stock	Stock ownership of executives
	Amount of monetary compensation paid to executives	Lpay	Natural logarithm of maximum amount of top three executives' compensation
	CEO duality	Dual	Dummy variable equal to 1 for CEO duality and 0 otherwise
	Balance of power between shareholders	Z	Ownership of largest shareholder/ownership of second largest shareholder
Control variables	Proportion of independent directors	Dirp	Number of independent directors/number of members of the board of directors
	Board size	Dirsize	Total number of members of the board of directors
	Investment opportunities of firm	Tobin's q	Tobin's q = firm's market value/firm's replacement cost = (number of tradable shares $*$ this year's closing price + non-tradable shares $*$ book value of net assets per share + book value of liabilities)/total assets at year-end
		Ppa	Ppa = firm's market value/total assets at year-end
	Firm performance	EPS	Earnings per share, EPS = Net profit/total number of ordinary shares at year-end
	Nature of controlling owner	Control	A dummy variable equal to 1 for a state-owned listed company, 0 otherwise
	Industry effects	Industry	First-level industry classification according to the CSRC industry standard; after removing the finance industry, we define 12 dummy variables for which the benchmark is M representing the comprehensive industry
	Year effects	Year	We define 4 dummy variables, for which the benchmark year is 2006

listed companies make capital investments in various forms. These results indicate that non-state-owned enterprises are more likely to use funds raised in over-financed IPOs to make capital investments than their state-owned counterparts.

4.2. Univariate analysis

In accordance with the hypotheses stated above, we use Tobin's q to measure investment opportunities and to divide the sample into two sub-groups. One sub-group consists of firms with a Tobin's q greater than the industry average, with the other sub-group comprising firms with a Tobin's q less than the industry average. Our logic outlined above suggests that if a company uses funds raised in an over-financed IPO for projects with good investment opportunities (Tobin's $q >$ industry average), it does not engage in over-investment and alleviates the agency problems of the enterprise. Otherwise, it engages in over-investment and exacerbates the agency problems of the enterprise. Panel A of Table 6 shows that in capital investments (RI or RF), the

Table 2
Descriptive statistics.

Variable	Mean	Median	SD	Min	Max	N
RI	0.3631	0.1303	0.4054	0.0000	1.0000	372
RF	7.27e−06	7.63e−07	1.31e−05	0.0000	1.13e−04	372
OI[a]	0.4126	0.3972	0.3923	0.0000	1.0000	223
OF[b]	8.43e−06	3.01e−06	1.29e−05	0.0000	0.0001	223
OI[c]	0.2809	0.0000	0.3735	0.0000	1.0000	200
OF[d]	4.88e−06	0.0000	9.61e−06	0.0000	6.31e−05	200
Dirsize	8.7263	9.0000	1.6230	3.0000	18.0000	369
Dirp	0.3649	0.3333	0.0506	0.2500	0.6667	369
Stock	0.3461	0.3425	0.3113	0.0000	0.9969	372
Lpay	14.48525	14.4702	0.6594	12.7195	16.5883	372
Z	4.1020	2.4371	4.7494	1.0000	34.6150	372
Control	0.1243	0.0000	0.3304	0.0000	1.0000	372
Eps	0.7666	0.6400	0.4884	0.1100	4.4200	372
Ppa	1.6132	1.5636	0.3341	0.9554	3.5671	372

[a] The over-investment proportion of funds raised in an over-financed IPO, that is, OI = capital investment of funds raised in over-financed IPO of listed company/(capital investment of funds raised in over-financed IPO + non-capital investment of funds raised in over-financed IPO) when Tobin's $q <$ industry average value.

[b] The over-investment proportion of funds raised in an over-financed IPO, that is, OF = capital investment of funds raised in over-financed IPO of listed company * 100/total assets at year-end when Tobin's $q <$ industry average value.

[c] The over-investment proportion of funds raised in an over-financed IPO, that is, OI = capital investment of funds raised in over-financed IPO of listed company/(capital investment of funds raised in over-financed IPO + non-capital investment of funds raised in over-financed IPO) when Ppa < industry average value.

[d] The over-investment proportion of funds raised in an over-financed IPO, that is, OF = capital investment of funds raised in over-financed IPO of listed company * 100/total assets at year-end when Ppa < industry average value.

number of sample firms with good investment opportunities is 149 and the number of sample firms with poor investment opportunities is 223, almost double that of the former. In addition, the mean t-value for the good investment opportunities group is significantly lower than that of the poor investment opportunities group (the mean differences are −9.98% and −3.89e−06, significant at the 1% level). The results show that enterprises do not use excess IPO funds for projects with good investment opportunities and that more such funds are used for projects with poor investment opportunities. This indicates that Chinese listed companies often engage in severe over-investment behavior when using funds raised in over-financed IPOs.

We also conduct parametric tests (*t*-tests) on the state-owned enterprise and non-state-owned enterprise subsamples respectively. Panel B of Table 6 reports the corresponding data. In Panel B, when capital investments are measured by RI, we find no significant differences between state-owned enterprises and non-state-owned enterprises. However, when capital investments are measured by RF, there are significant differences between state-owned enterprises and their non-state-owned counterparts. The mean value for state-owned enterprises is lower than that for non-state-owned enterprises (the mean difference is −4.83e−06, significant at the 1% level). This indicates that the over-investment problem is less severe among state-controlled listed companies than among non-state-controlled listed companies. Wang and Zhou (2006) and Wang (2008) demonstrate that because of their greater social and public responsibilities, state-owned companies more effectively protect the interests of investors and thus have better firm performance. We believe that because managers of state-owned enterprises are often appointed by the Chinese government, they are subject to government oversight and intervention and thus may behave in a manner consistent with the interests of investors and superior to that of the managers of other companies, thereby reducing agency costs (Li, 2009). Therefore, the over-investment problem is less acute in state-controlled listed companies than in their non-state-controlled listed counterparts.

We also undertake further parametric tests (*t*-tests) of state-owned enterprises and non-state-owned enterprises, respectively, according to their investment opportunities (Tobin's *q*). The corresponding results are shown in Panels C and D of Table 6. The results reported in Panel C show that most state-owned enterprises are more likely to engage in projects with good investment opportunities. Moreover, when capital investments are measured by RF in Panel C, the mean value of good investment opportunities is significantly lower than that of poor investment opportunities (the mean difference is −4.15e−06, significant at the 5% level). This

Table 3
Descriptive statistics regarding the investment purpose of funds raised in over-financed IPOs.

Investment purpose of funds raised in over-financed IPOs	Number of companies	Amount (¥)	Percentage 1[a] (%)	Percentage 2[b] (%)
Panel A: Descriptive statistics regarding the non-capital investment of funds raised in over-financed IPOs				
Add liquidity	246	1826099.56	54.84	25.49
Deposit in dedicated account	1	9033.98	0.27	0.13
Pay back bank loans	148	1494811.35	44.89	20.87
Working capital related to the main business	30	0.00	0.0000	0.00
Total		3329945	100	46.49
			Percentage 3[c] (%)	Percentage 4[d] (%)
Panel B: Descriptive statistics regarding the capital investment of funds raised in over-financed IPOs				
Set up subsidiaries	52	447617.31	11.68	6.25
Mergers and acquisitions	36	579439.01	15.12	8.09
Purchase plant, construct self-built buildings and plant	3	49538.20	1.29	0.69
Purchase land and real estate	21	141895.47	3.70	2.00
Purchase of office space	1	4994	0.13	0.07
Purchase office supplies	1	7000	0.18	0.10
Investment in subsidiaries	40	409083.61	10.67	5.71
Investment projects and construction projects	111	2150250.1	56.10	30.02
Capital increase	1	4900	0.13	0.07
Overseas investment	1	2200	0.06	0.03
Investment in the main business	2	16745.74	0.43	0.23
Advertising	1	2170	0.06	0.03
Marketing services network construction	1	14562	0.38	0.20
Expansion of headquarters R&D center	1	2405	0.07	0.02
Not disclosed	170	0.00	0.00	0.0000
Total		3832800	100	53.51

[a] Percentage 1 = Amount/non-capital investment of funds raised in over-financed IPO.
[b] Percentage 2 = Amount/(capital investment of funds raised in over-financed IPO + non-capital investment of funds raised in over-financed IPO).
[c] Percentage 3 = Amount/capital investment of funds raised in over-financed IPO.
[d] Percentage 4 = Amount/(capital investment of funds raised in over-financed IPO + non-capital investment of funds raised in over-financed IPO).

indicates that some state-owned enterprises engage in over-investment. The results in Panel D where capital investments are measured by RI and RF show the mean value of good investment opportunities is significantly lower than that of poor investment opportunities (the mean differences are -0.0932 and −3.89e−06, significant at the 5% and 1% levels, respectively). These results once again demonstrate that non-state-owned enterprises are more likely than their state-owned counterparts to use funds raised in over-financed IPOs to make capital investments, and have a more serious problem of over-investment.

4.3. Multivariate regression analysis

We examine the relationship between internal governance mechanisms and over-investment behavior further through multivariate analysis. Table 7 presents the results. The coefficients on Stock are negative and statistically insignificant in models (1) and (2). This means ownership incentives paid to executives do not curb over-investment, thus rejecting hypothesis 1. We find that the coefficients for Lpay and Dual are positive and statistically significant in models (1) and (2). This indicates that executives paid greater monetary rewards and executives in firms with CEO duality are more likely to use excess IPO funds to engage in over-investment. The empirical evidence in Table 7 thus supports hypotheses 2 and 3. We also find that the coefficients for Z are negative and statistically significant in models (1) and (2), indicating the greater the balance of power between shareholders, the greater the alleviation of over-investment in the use of excess IPO funds. The empirical evidence reported in Table 7 thus supports hypothesis 4. In the results for the control variables, we find that the coefficients for Eps are positive and statistically significant in models (1) and (2). Therefore, better firm performance (EPS) leads to a greater possibility of over-investment.

Table 4
Descriptive statistics regarding the investment purpose of funds raised in over-financed IPOs annually.

Investment purpose of funds raised in over-financed IPOs	2006		2007		2008		2009		2010	
	Amount (¥ Ten thousand)	Percentage (%)	Amount (¥ Ten thousand)	Percentage (%)	Amount (¥ Ten thousand)	Percentage (%)	Amount (¥ Ten thousand)	Percentage (%)	Amount (¥ Ten thousand)	Percentage (%)
Add liquidity	108574.84	54.19	78391.41	79.67	58115.25	100	172419.10	17.93	1408598.96	23.71
Deposit in dedicated account	0	0	0	0	0	0	0	0	9033.98	0.1521
Pay back bank loans	0	0	0	0	0	0	65014.21	6.76	1429797.14	24.07
Working capital related to the main business	0	0	0	0	0	0	0	0	0	0
Set up subsidiaries	0	0	20000.00	20.33	0	0	79002	8.21	348615.3	5.87
Mergers and acquisitions	61896.00	30.89	0	0	0	0	135301.43	14.07	382241.58	6.43
Purchase plant, construct self-built buildings and plant	29878.20	14.92	0	0	0	0	15160.00	1.57	4500	0.08
Purchase land and real estate	0	0	0	0	0	0	42500.85	4.42	99394.62	1.67
Purchase of office space	0	0	0	0	0	0	65014.21	6.75	4994	0.08
Purchase office supplies	0	0	0	0	0	0	37058.54	3.86	7000.00	0.12
Investment in subsidiaries	0	0	0	0	0	0	37058.54	3.86	371125.07	6.25
Investment projects and construction projects	0	0	0	0	0	0	312583.9	32.52	1837666.18	30.93
Capital increase	0	0	0	0	0	0	0	0	4900	0.08
Overseas investment	0	0	0	0	0	0	0	0	2200	0.04
Advertising	0	0	0	0	0	0	0	0	2170	0.04
Marketing services network construction	0	0	0	0	0	0	0	0	14562	0.25
Expansion of headquarters R&D center	0	0	0	0	0	0	0	0	2405.00	0.04
Investment in the main business	0	0	0	0	0	0	4745.735	0.5	12000	0.19
Not disclosed	0	0	0	0	0	0	0	0	0	0

Table 5
State-owned vs. non-state-owned enterprises: Descriptive statistics regarding the investment purpose of funds raised in over-financed IPOs.

Investment purpose of funds raised in over-financed IPOs	State-owned enterprises		Non-state-owned enterprises	
	Amount (¥ Ten thousand)	Percentage (%)	Amount (¥ Ten thousand)	Percentage (%)
Add liquidity	251617.47	40.63	1566682.09	24.04
Deposit in dedicated account	0	0	9033.98	0.14
Pay back bank loans	57654.43	9.31	1431656.92	21.97
Working capital related to the main business	0	0	0	0
Set up subsidiaries	31031.00	5.01	415056.3	6.37
Mergers and acquisitions	27670.00	4.47	550789.81	8.45
Purchase plant, construct self-built buildings and plant	0	0	49538.20	0.76
Purchase land and real estate	7082.50	1.14	134812.97	2.07
Purchase of office space	0	0	4994	0.08
Purchase office supplies	0	0	7000	0.11
Investment in subsidiaries	13481	2.18	395602.61	6.07
Investment projects and construction projects	226019.48	36.50	1912706	29.35
Capital increase	0	0	4900	0.08
Overseas investment	0	0	2200	0.03
Advertising	0	0	2170	0.03
Marketing services network construction	0	0	14562	0.22
Expansion of headquarters R&D center	0	0	2405.00	0.04
Investment in the main business	4745.735	0.8	12000	0.18
Not disclosed	0	0	0	0

Table 6
Univariate analysis of capital investments.

Variable	Mean (*N*)		Mean difference test (*t*-value)
	Tobin's $q >$ industry average	Tobin's $q <$ industry average	
Panel A: Full sample			
RI	0.3231 (149)	0.4229 (223)	−0.0998 (−2.3396***)
RF	5.71e−06 (149)	9.60e−06 (223)	−3.89e−06 (−2.8308***)
	Mean (*N*)		
	State-owned enterprises	Non-state-owned enterprises	
Panel B: State-owned enterprises vs. non-state-owned enterprises			
RI	0.3186 (46)	0.3686 (326)	−0.0500 (−0.7806)
RF	3.05e−06 (46)	7.88e−06 (326)	−4.83e−06 (−2.3442***)
	Mean (*N*)		
	Tobin's $q >$ industry average	Tobin's $q <$ industry average	
Panel C: State-owned enterprises			
RI	0. 2573 (19)	0.4057 (27)	−0.1484 (−1.1206)
RF	1.34e−06 (19)	5.49e−06 (27)	−4.15e−06 (−2.2927**)
Panel D: Non-state-owned enterprises			
RI	0.3322 (130)	0. 4254 (196)	−0.0932 (−2.0700**)
RF	6.32e−06 (130)	1.02e−05 (196)	−3.89e−06 (−2.5297***)

*Statistical significance at the 10% level for two-tailed tests.
** Statistical significance at the 5% level for two-tailed tests.
*** Statistical significance at the 1% level for two-tailed tests.

We further investigate the influence of over-investment behavior among enterprises on future firm performance and report the results in Table 8. Over-investment (OI and OF) is significantly negatively related to the return on long-term capital, indicating the misuse of funds raised in over-financed IPOs significantly reduces the company's future investment yield, thus negatively affecting the firm's performance in the future.

Table 7
Regression results for internal corporate governance and the over-investment of funds raised in over-financed IPOs.

Variables	Predicted sign	OI (1)		OF (2)	
		Coef.	*t*-Value	Coef.	*t*-Value
Cons	?	−0.164	−1.00	−2.45e−05	−1.45
Stock	−	−1.18e−10	−1.42	−9.01e−06	−1.22
Lpay	+	0.058***	4.14	3.33e−05***	5.15
Dual	+	0.057**	2.53	1.09e−04**	2.38
Dirp	−	−0.075	−0.69	−9.43e−03	−0.58
Dirsize	−	−0.544	−0.82	−2.35e−04	−0.55
Z	−	−0.004*	−1.92	−2.45e−05***	−3.96
Eps	+	0.092***	2.75	1.42e−04**	2.23
Control	−	−0.399	−0.96	−2.24e−04	−0.78
Year		Yes		Yes	
Industry		Yes		Yes	
Pseudo R2		0.0773		−0.0020	
N		222		222	

We use clustering by years in the regression.
* Statistical significance at the 10% level for two-tailed tests.
** Statistical significance at the 5% level for two-tailed tests.
*** Statistical significance at the 1% level for two-tailed tests.

Table 8
Regression results for corporate over-investment and future return on investment.

Variables	Predicted sign	ROLC		ROLC	
		Coef.	*t*-Value	Coef.	*t*-Value
Cons	?	0.077	0.44	0.091	0.53
OI	−	−0.001**	−2.47		
OF	−			−571.09*	−1.89
Size	+	0.005	0.63	0.005	0.57
Lev	+	0.032*	1.65	0.023	0.61
Year		Yes		Yes	
Industry		Yes		Yes	
F-statistics		2.03**		2.27***	
Adj-R2		7.05%		8.57%	
N		222		222	

We use OI and OF as proxy variables for over-investment when Tobin's $q <$ industry average.
* Statistical significance at the 10% level for two-tailed tests.
** Statistical significance at the 5% level for two-tailed tests.
*** Statistical significance at the 1% level for two-tailed tests.

5. Robustness tests

5.1. Tests of corporate investment opportunities

We use the market to book value ratio (Ppa) as the proxy variable for corporate investment opportunities in conducting our robustness tests. We form a new sample of firms with a market to book value ratio higher than the industry average (comprising 200 firm-year observations) to carry out parametric tests (*t*-tests). The corresponding results are shown in Tables 9–11. The results reported in Table 9 are consistent with those of Table 6, indicating our earlier empirical results are robust. The results shown in Table 10 also remain consistent with those reported in Tables 7 and 11 results are consistent with the results of Table 8. Taken together, these results provide additional support for our hypotheses.

Table 9
Univariate analysis of capital investment (robustness tests).

Variable	Mean (*N*)		Mean difference test (*t*-value)
	Ppa > industry average	Ppa < industry average	
Panel A: Full sample			
RI	0.2964 (172)	0.4405 (200)	−0.1441 (−3.4684***)
RF	4.99e−06 (172)	9.92e−06 (200)	−4.93e−06 (−3.6811***)
	Mean (*N*)		
	State-owned enterprises	Non-state-owned enterprises	
Panel B: State-owned enterprises vs. non-state-owned enterprises			
RI	0.3186 (46)	0.3686 (326)	−0.0500 (−0.7806)
RF	3.05e−06 (46)	7.88e−06 (326)	−4.83e−06 (−2.3442***)
	Mean (*N*)		
	Ppa > industry average	Ppa < industry average	
Panel C: State-owned enterprises			
RI	0.2854 (17)	0.3753 (29)	−0.0899 (−0.6593)
RF	1.14e−06 (17)	6.31e−06 (29)	−5.17e−06 (−2.8881***)
Panel D: Non-state-owned enterprises			
RI	0.2983 (155)	0.4477 (171)	−0.1494 (−3.4216***)
RF	5.64e−06 (155)	1.03e−05 (171)	−4.68e−06 (−3.1198***)

* Statistical significance at the 10% level for two-tailed tests.
** Statistical significance at the 5% level for two-tailed tests.
*** Statistical significance at the 1% level for two-tailed tests.

Table 10
Regression results for internal corporate governance and over-investment of funds raised in over-financed IPOs (robustness tests).

Variables	Predicted sign	OI (1)		OF (2)	
		Coef.	*t*-Value	Coef.	*t*-Value
Cons	?	−1.482*	−1.77	−5.64e−04	−0.23
Stock	−	−4.85e−10	−0.75	−3.22e−14	−0.16
Lpay	+	0.106***	4.19	2.83e−05*	1.91
Dual	+	0.061***	5.30	5.72e−05***	3.30
Dirp	−	−1.025	−0.47	−3.71e−04	−0.83
Dirsize	−	−0.200	−0.42	−2.36e−05	−0.62
Z	−	−0.010***	−3.94	−1.23e−05**	−2.45
Eps	+	0.254***	6.34	8.43e−05***	4.87
Control		−0.100	−0.45	−3.00e−04	−1.23
Year		Yes		Yes	
Industry		Yes		Yes	
Pseudo R2		0.1360		−0.0024	
N		200		200	

We use clustering by years in the regression.
* Statistical significance at the 10% level for two-tailed tests.
** Statistical significance at the 5% level for two-tailed tests.
*** Statistical significance at the 1% level for two-tailed tests.

5.2. Tests of selection bias

If listed companies self-select in making disclosures on the use of funds raised in over-financed IPOs, the main regression results of this study may be subject to self-selection bias. Therefore, we also perform the following robustness tests. We select as the sample Shenzhen A-share listed companies that launched over-financed IPOs in the 2006–2010 period. Since 2009, the Shenzhen Stock Exchange has required listed

Table 11
Regression results for corporate over-investment and future return on investment (robustness tests).

Variables	Predicted sign	ROLC		ROLC	
		Coef.	*t*-Value	Coef.	*t*-Value
Cons	?	−0.223	−1.07	−0.214	−1.07
OI	−	−0.001*	−1.67		
OF	−			−1366.63**	−2.56
Size	+	0.020**	2.08	0.020**	2.14
Lev	+	−0.006	−0.13	−0.012	−0.27
Year		Yes		Yes	
Industry		Yes		Yes	
F-statistics		2.12***		2.56***	
Adj-R2		8.83%		11.86%	
N		200		200	

We use OI and OF as proxy variables for over-investment when Ppa < industry average.
* Statistical significance at the 10% level for two-tailed tests.
** Statistical significance at the 5% level for two-tailed tests.
*** Statistical significance at the 1% level for two-tailed tests.

Table 12
Regression results for internal corporate governance and over-investment of funds raised in over-financed IPOs (2009–2010).

Variables	Predicted sign	OI (1)		OF (2)	
		Coef.	*t*-Value	Coef.	*t*-Value
Cons	?	−2.15	−0.06	−6.67e−03	−1.48
Stock	−	−2.64e−10	−0.27	−6.05e−07	−0.02
Lpay	+	0.120*	1.67	3.34e−04**	2.02
Dual	+	0.036**	2.45	1.51e−04***	2.85
Dirp	−	−0.846	−0.76	−1.98e−03	−0.51
Dirsize	−	−0.129	−1.15	−2.64e−04	−0.68
Z	−	−0.123*	−1.82	−8.51e−04**	−2.37
Eps	+	0.322***	3.09	1.17e−03**	2.51
Control	−	−0.051	−0.25	−5.52e−04	−0.80
Year		Yes		Yes	
Industry		Yes		Yes	
Pseudo R2		0.968		-0.0321	
N		159		159	

We use clustering by years in the regression.
We use OI and OF as proxy variables for over-investment when Tobin's q < industry average.
* Statistical significance at the 10% level for two-tailed tests.
** Statistical significance at the 5% level for two-tailed tests.
*** Statistical significance at the 1% level for two-tailed tests.

companies to disclose how they use funds raised in over-financed IPOs. The main sample used for this study thus comprises two groups: listed companies making voluntary disclosures and listed companies making mandatory disclosures. Therefore, we limit the sample used to retest the hypotheses to listed companies making mandatory disclosures on the use of funds raised in over-financed IPOs after 2009. Tables 12 and 13 report the corresponding results.

The results of the robustness tests are all consistent with the results of earlier tests. Tables 12 and 13 show that executives who receive greater monetary compensation are more likely to use funds raised in over-financed IPOs to engage in over-investment. Moreover, CEO duality will lead to the over-investment of excess IPO funds. In addition, improving the balance of power between shareholders will help alleviate the over-investment of funds raised in over-financed IPOs. Taken together, these findings provide further support for the hypotheses and show the main empirical results are robust to a variety of specifications.

Table 13
Regression results for internal corporate governance and over-investment of funds raised in over-financed IPOs (2009–2010).

Variables	Predicted sign	OI (1)		OF (2)	
		Coef.	*t*-Value	Coef.	*t*-Value
Cons	?	−2.845	−0.95	−1.77e−04	−1.36
Stock	−	−1.84e−09	−0.57	−2.04e−13	−0.76
Lpay	+	0.083*	1.71	1.04e−04*	1.78
Dual	+	0.042**	2.25	5.32e−04*	1.74
Dirp	−	−1.795	−0.43	−2.57e−03	−0.68
Dirsize	−	−0.052	−0.29	−3.89e−06	−0.34
Z	−	−0.034**	−2.26	−8.22e−05**	−1.87
Eps	+	0.184*	1.97	5.67e−04**	1.84
Control		−0.045	−0.90	−5.29e−03	−1.12
Year		Yes		Yes	
Industry		Yes		Yes	
Pseudo R2		−0.0067		−0.0114	
N		161		161	

We use clustering by years in the regression.
We use OI and OF as proxy variables for over-investment when Ppa < industry average.
*** Statistical significance at the 1% level for two-tailed tests.
* Statistical significance at the 10% level for two-tailed tests.
** Statistical significance at the 5% level for two-tailed tests.

6. Conclusions and implications

As a phenomenon unique to China's capital market, IPO over-financing has become an important concern for the China Securities Regulatory Commission, China's domestic financial media and scholars alike. Using a sample of Shenzhen A-share listed companies that launched over-financed IPOs in the 2006–2010 period, we explore the relationship between internal corporate governance and the use of funds raised in over-financed IPOs. The major findings are as follows.

First, due to agency problems, severe over-investment behavior is prevalent among listed companies that raise excess funds in their IPOs. The major uses of funds raised in over-financed IPOs are construction projects, mergers and acquisitions, and establishing and investing in subsidiary companies. In addition, over-investment behavior has a negative impact on the future performance of the enterprise and can significantly negatively affect the long-term return on firm capital.

Second, internal corporate governance mechanisms can be effective in alleviating the over-investment of funds raised in over-financed IPOs of listed companies. Improving the balance of power between shareholders will help alleviate the over-investment of funds raised in over-financed IPOs. However, CEO duality leads to the over-investment of excess IPO funds. In addition, the greater the monetary rewards paid to executives, the more likely they will use funds raised in over-financed IPOs to engage in over-investment.

We also find that the over-investment problem encountered in the use of excess IPO funds is less common among state-controlled listed companies than it is among their non-state-controlled counterparts. When making capital investments, state-controlled listed companies tend to limit funding to construction projects, mergers and acquisitions, and establishing and investing in subsidiary companies. In contrast, non-state-controlled listed companies participate in various forms of capital investment.

Our study raises a number of implications for researchers, managers and regulators. First, the Growth Enterprises Market (GEM) complements and improves the existing Chinese capital market system. The GEM helps accelerate the growth of innovative high-tech enterprises, adjust the structure of Chinese industry, transform and upgrade Chinese small and medium enterprises, and strengthen the international competitiveness of Chinese firms. Although the IPO over-financing phenomenon currently seen in the GEM is the result of market choice, this not only goes against the original purpose of setting up the GEM, but also poses a major challenge to the stable and healthy development of the Chinese capital market. Therefore, GEM systems require further improvement, such as by regulating IPO pricing, reducing the IPO threshold and establishing an exit mechanism to raise the standard of supervision of the use of funds raised in over-financed IPOs.

Second, good internal corporate governance of listed companies can effectively alleviate the over-investment problem encountered in the use of excess IPO funds and improve the efficiency with which such funds are used. The corporate governance mechanisms of listed companies should thus be improved further to promote the sound operation of GEM companies. Third, this study highlights the need to take further steps to establish and improve China's multi-level capital market system and widen the range of direct financing channels available to enterprises, while continuing to broaden the investment channels open to residents and guiding the reasonable and orderly flow of funds.

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References

Balkin, D.B., Markman, G.D., Gomez-Meijia, L.R., 2000. Is CEO pay in high-technology firms related to innovation? Academy of Management Journal 43 (6), 1118–1129.

Broussard, J.P., Buchenroth, S.A., Pilotte, E.A., 2004. CEO incentives, cash flow, and investment. Financial Management 33 (2), 51–70.

Chen, W.B., Chen, X.Y., 2005. Large shareholders agency problem and the use of IPO proceeds. Nankai Business Review 3, 4–8 (in Chinese).

Chen, D.H., Liang, S.K., Jiang, D.Q., 2010. How marketization affects incentive contract costs and choices: perks and monetary compensations. Accounting Research 11, 56–64 (in Chinese).

Cronqvist, H., Fahlenbrach, R., 2009. Large shareholders and corporate policies. Review of Financial Studies 22 (10), 3941–3976.

Eisenhardt, K.M., 1988. Agency-and institutional-theory explanations: the case of retail sales compensation. Academy of Management Journal 31 (3), 488–511.

Fama, E.F., Jensen, M.C., 1983. Separation of ownership and control. Journal of Law and Economics 26, 301–325.

Fang, J.X., Fang, F., 2010. IPO market-oriented reform and the over financing. Securities Market Herald 12, 39–45 (in Chinese).

Ghose, S., 2005. Corporate Governance and Over-investment by the US Oil Industry. Working Paper. SSRN.

Hall, B.J., Liebman, J.B., 1998. Are CEOs really paid like bureaucrats? The Quarterly Journal of Economics 113 (3), 653–691.

Jensen, M.C., 1986. Agency costs of free cash flow, corporate finance, and takeovers. American Economic Review 76, 323–329.

Jensen, M.C., 1993. The modern industrial revolution, exit, and the failure of internal control systems. Journal of Finance 48, 831–880.

Jensen, M.C., Meckling, W., 1976. Theory of the firm:managerial behavior, agency costs and capital structure. Journal of Financial Economics 3 (4), 305–360.

Jensen, M., Murphy, K., 1990. Performance compensation and top management incentives. Journal of Political Economy 98, 225–264.

Jiang, X., Li, Q., 2010. Analysis of the over-financing phenomenon of the GEM. China Finance 2, 47–49 (in Chinese).

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 1999. Corporate ownership around the world. Journal of Finance 54 (2), 471–517.

Lamont, O., 1997. Cash flow and investment: evidence from internal capital markets. Journal of Finance 52, 83–109.

Li, Z.Q., 2000. Incentive mechanism and firm performance: an empirical study based on listed companies. Accounting Research 11, 24–30 (in Chinese).

Li, M.H., 2009. Ownership structure, corporate governance and agency cost of equity. Journal of Financial Research 2, 149–168 (in Chinese).

Liu, C.G., 2006. Corporate governance mechanisms, free cash flow and over-investment behavior among listed companies. Economic Science 4, 50–58 (in Chinese).

Liu, S.B., Dai, W.H., 2004. Research on change of committed investment project of listed company in China. Economic Research Journal 5, 88–97 (in Chinese).

Liu, B., Liu, X., Li, S.X., Ho, S., 2003. An empirical study on the mutual effect between CEO's pay and the firm's performance. Accounting Research 3, 35–39 (in Chinese).

Luo, D.L., Ying, Q.W., Chang, L., 2012. The lines of credit, property and overinvestment: Evidences come from Chinese listed firms. The Journal of World Economy 3, 48–67 (in Chinese).

Morck, R., Shleifer, A., Vishny, R., 1988. Management ownership and market valuation: an empirical analysis. Journal of Financial Economics 20, 293–315.

Qin, J.Q., 2010. Strategy committee and overinvestment behavior of listed companies. Journal of Financial Research 6, 124–142 (in Chinese).

Richardson, S., 2006. Over-investment of free cash flow. Review of Accounting Studies 11, 159–189.
Shleifer, A., Vishny, R.W., 1986. Large shareholders and corporate control. Journal of Political Economy 94, 461–488.
Shleifer, A., Vishny, R.W., 1997. A survey of corporate governance. Journal of Finance 52, 737–783.
Tang, X.S., Zhou, X.S., Ma, R.J., 2010. Government intervention, GDP growth and local SOE overinvestment. Journal of Financial Research 8, 33–48 (in Chinese).
Tang, Q.Q., Xia, Y., Xu, X., 2011. The equity incentive of management and R&D investment: an endogenous perspective. China Accounting Review 9 (1), 21–42 (in Chinese).
Tu, G.Q., Liu, F., 2010. Activist shareholders' character and surveillance effects. Management World 11, 132–142 (in Chinese).
Wang, P., 2008. Investor protection, agency cost and corporate performance. Economic Research Journal 2, 68–82 (in Chinese).
Wang, P., Zhou, L.A., 2006. Control right, ownership of large shareholder and corporate performance. Journal of Financial Research 2, 88–98 (in Chinese).
Wang, M.B., Liu, S.S., Kong, D.M., 2011. Change of raised capital purpose, corporate governance, and firm performance. Studies of International Finance 11, 75–86 (in Chinese).
Wei, G., 2000. Incentives for top management and performance of listed companies. Economic Research Journal 3, 32–39 (in Chinese).
Wei, M.H., Liu, J.H., 2007. Cash dividends, corporate governance and over-investment of SOEs. Management World 4, 88–95 (in Chinese).
Xin, Q.Q., Lin, B., Wang, Y.C., 2007. Government control, executive compensation and capital investment. Economic Research Journal 8, 110–122 (in Chinese).
Yermack, D., 1996. Higher market valuation of companies with a small board of directors. Journal of Financial Economics 40, 185–211.
Yu, H.H., Xu, L.B., Chen, B.Z., 2010. The control right of ultimate controlling shareholder and overinvestment of free cash flow. Economic Research Journal 8, 103–114 (in Chinese).
Zhang, W.G., Zhai, C.Y., 2005. On the motive of changing investment projects of raising money through public offering. Accounting Research 10, 19–24 (in Chinese).
Zhang, J.R., Zhao, J.W., Zhang, J., 2003. Empirical analysis on pertinence between senior management and listed company's operation performance. Accounting Research 9, 29–34 (in Chinese).
Zhu, H.J., Wang, H., 2004. Can "check-and-balance of stock ownership" improve company's control? A case study of struggle for the controlling right of Hongzhi Science and Technology limited Company. Management World 10, 114–123 (in Chinese).

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An empirical study of the effect of venture capital participation on the accounting information quality of IPO firms

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ABSTRACT

Using a sample of IPO companies on the Shenzhen Small and Median Enterprise Board and the ChiNext Stock Market between 2005 and 2009, this paper analyzes the effect of venture capital participation on accounting information quality. We find that venture capitalists have a significant effect on earnings management, with reduced discretionary accruals before the expiration of the equity lock-up period and enhanced discretionary accruals after the expiration of the equity lock-up period. Our findings support the moral hazard hypothesis of venture capital, but not the certification/monitoring role of venture capital in IPOs. In addition, we find that venture capital plays a more important role in the earnings management of non-state-owned IPO companies than of state-owned companies.

1. Introduction

China's venture capital market has recently witnessed tremendous development under the influence of capital internationalization and with support from the government. Venture capital (VC) generally refers to medium- and long-term capital that is invested in unlisted enterprises and that gains investment returns through

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IPOs, mergers, acquisitions, liquidations and transferring the equity of portfolio firms.[1] IPOs are the most popular exit strategy because they bring the highest returns on VC investments. Thus, venture capitalists (VCs) are the main participants in IPO activities and their behavior has a significant influence on the operation of the capital market. Accounting information is one of the major sources of information for the capital market. Higher accounting information quality makes the allocation of capital market resources more efficient and gives investors more protection. Therefore, to protect investors more effectively, the effect of the participation of VCs on the accounting information quality of IPO firms has received much attention.

Based on the framework of asymmetric information, Barry et al. (1990) and Sahlman (1990) proposed the certification/monitoring hypothesis. Under this hypothesis, VCs as professional investors play a certification role in the identification of the portfolio firm's intrinsic value. To reduce agency costs and increase the value of portfolio firms, VCs as large shareholders will actively monitor the portfolio firms, including their accounting information quality. Compared to companies without VC support, the earnings quality of VC-backed IPO companies should be better. In contrast, Gompers (1996) and Lee and Wahal (2004) argue that the limited lifetime and special organizational structure of IPO companies mean that VCs must pay attention to how to get back their original investment and receive high returns, so VCs are likely to participate in portfolio firms' IPO activities opportunistically and have moral hazard problems. This hypothesis implies that VCs may collude with portfolio firms or exert pressure on management, using their own professional advantages or social networks[2] with underwriters and government, to help the management of IPO firms manage accounting earnings before and during the IPO, thereby increasing the IPO price and increasing their investment return following the IPO.

Institutional theory holds that the beliefs, goals and behavior of individuals and groups are influenced by various institutional environments (Scott, 1987, 1995). Particular institutional environments will inevitably lead to particular venture capital IPO behavior, including the effect on accounting information quality in IPO companies. Compared with the US market, China's market has some special features. For example, the Chinese government provides considerable guidance and support for VCs to promote innovation. In September 1985, the State Council officially approved the establishment of the New Technology Venture Investment Company, China's first franchised venture capital company. Since then, many VCs have been established with the support of local governments, such as Beijing Venture Capital, Shanghai Venture Capital, Suzhou High-tech Investment Company and the Shenzhen High-tech Investment Company (Chen et al., 2011). However, the development of VCs in the US market is guided by market forces. Meanwhile, China's stock market is a newly emerging market with a short history and relatively weak investor protection. Thus, to encourage long-term shareholding by VCs and reduce the negative effects of equity selling immediately after an IPO, the China Security Regulation Committee (CSRC) mandated a lock-up period regulation, which states that VCs are not allowed to sell their equity until at least 12 months after the IPO. In contrast, VCs in the US market can sell their equity immediately after the IPO.

Most extant studies in this area are based on the mature Anglo-American market environment. Although some research focuses on emerging Asian markets, few studies discuss China's market specifically. In this study, we use medium and small IPO firms in China from 2005 to 2009 as our sample, to study the participation of VCs on VC portfolio firms' earnings management 1 year pre-IPO, in the IPO year and 1 year post-IPO, thus allowing a comprehensive analysis of the effect of VCs on accounting information quality before and after the expiration of the lock-up period. After controlling for the sample self-selection endogeneity problem, we find that the participation of VCs affects the earnings management of IPO firms. Earnings management is lower before the expiration of the lock-up period and higher after the lock-up period expires. The empirical evidence thus supports the moral hazard hypothesis. Furthermore, due to financing bottlenecks and the poor corporate governance of non-state-owned enterprises, the participation of VCs has a greater effect on the extent of earnings management for non-state-owned enterprises before and after the expiration of the lock-up period.

[1] In fact, VC refers to investment in the early stages of an enterprise. However, due to the short history of the venture capital market, many VCs not only perform early-stage investment, but also pre-IPO investment. As it is hard to discriminate between them, we include both types of VC in this study.

[2] According to Chemmanur and Loutskina (2007), VCs often maintain close relationships with underwriters.

The remainder of this paper proceeds as follows. Section 2 reviews the related literature, analyzes the institutional background in China and develops the hypotheses. Section 3 describes the research design and introduces the data and variables. Section 4 presents the empirical results. Section 5 concludes the paper.

2. Literature review and research hypotheses

There are two hypotheses on the effect of VCs' participation in their portfolio companies' IPOs: certification/monitoring hypothesis and moral hazard hypothesis. These two hypotheses have different implications for the effects of VC participation on the accounting information quality of IPO companies. Most studies use earnings management as a proxy for accounting information quality, which refers to the behavior of increasing accounting earnings in the current period by means of accounting accruals and real transaction arrangements. Lower earnings management means higher accounting information quality.

In the US market, VCs are allowed to sell the shares of portfolio companies immediately after their IPO and an IPO is the first opportunity for a private firm to raise equity from dispersed investors. Therefore, most of the studies based on the US market focus on the effect of VC participation on accounting information quality in the pre-IPO and IPO process. The certification/monitoring hypothesis predicts that to reduce agency costs and establish their professional investor reputation, VCs should be actively involved in corporate governance, including monitoring and motivating portfolio firms' managers, which at the same time reduces the conflict of interest between inside and outside investors (Baker and Gompers, 2003). This also means that VCs should monitor accounting information quality, which is an important part of corporate governance. There is some evidence to support this view. For example, Ball and Shivakumar (2005) find that information disclosure in the IPO process is highly regulated. Although earnings management and less conservative information disclosure increase pre-IPO, this is reversed after the IPO, bringing serious economic consequences if discovered by the market. Thus, to meet stock market requirements, private companies in the United Kingdom tend to report more conservative accounting information several years prior to their IPO. The companies backed by VC are influenced more by this force, because VC backing increases the predictability of listing compared with non-VC-backed firms. Therefore, in the process of going public, VC-backed firms disclose losses as early as possible to satisfy the future requirement of timely disclosure of information, which results in more conservative accounting information and less earnings management. Gioielli et al. (2008) compare the pre-IPO and IPO discretionary accruals of VC-backed firms with those of non-VC-backed firms and find that the earnings management of VC-backed firms is less than that of non-VC-backed firms. Hochberg (2003), Morsfield and Tan (2006) and Katz (2009) report similar findings. Moreover, VC-backed firms also have lower discretionary accruals after IPO (Gioielli et al., 2008) and a lower likelihood of financial restatements (Agrawal and Cooper, 2009). Accounting information quality also increases with the participation of more reputable and older VCs (Agrawal and Cooper, 2009).

However, as an IPO is the first time a private firm can raise equity from public investors, it also magnifies the VC's investment value, which exacerbates the moral hazard problem. To ensure a higher IPO price and obtain higher returns on the sale of their equity during and after IPOs, VCs will help portfolio firms to manage earnings, which leads to lower accounting information quality and further increases conflicts between insider stakeholders and outsider investors. This view is also supported by a number of studies. For example, Darrough and Rangan (2005) find that VC-backed firms reduce R&D expenditures during the IPO year to ensure higher accounting earnings. In addition to R&D expenditure arrangements, discretionary accruals have also been used as a measure of earnings management. Using reverse leveraged buyouts as their sample, Chou et al. (2006) find sample firms manage earnings by discretionary accruals in the IPO year. Furthermore, Wongsunwai (2007) documents that only the highest-quality VCs inhibit earnings management by means of discretionary accruals, real transaction arrangements and financial restatements in IPOs. At the same time, as VCs usually occupy seats on their portfolio firms' boards, are involved in their management and get the information they need directly, they lack the incentive to monitor the quality of accounting information. Hence, earnings management is not necessarily lower in VC-backed IPO companies and as the value of the VC's stakeholding increases, the information content of accounting earnings declines further (Cohen and Langberg, 2006).

The institutional environment has an influence on the behavior of economic entities. China's institutional environment has some special features as follows. First, under the influence of China's traditional culture, VCs give more help to portfolio firms in the establishment of social relations than in the provision of value-added services. Hu and Bu (2012) show that companies backed by VCs with political connections are more likely to have successful IPOs than companies backed by VCs with no political connections and only a few VCs help portfolio firms to form strategic alliances with VCs' parent companies or other companies. These factors increase VCs' moral hazard in earnings management during IPO. Second, as mentioned above, most VC companies in China are owned by the government. Government-backed VCs are thus influenced by their public functions, which reduces the incentive for VCs to monitor their portfolio firms as active shareholders. At the same time, VC companies in China are often organized as limited liability corporations, which incur more agency costs than partnerships, thus further reducing monitoring efficiency. Additionally, China's capital market is an emerging market without a long history. Although the regulatory systems are being improved, there are still some problems with the market mechanism and support systems, which result in low investor protection and further exacerbate the moral hazard problem of VCs.

As the supply of venture capital cannot satisfy the current market demand in China, the reputation effect cannot reduce the moral hazard of VCs in the current environment. At the same time, the rapid changes in the regulatory systems of emerging capital markets mean reduced safety for market participants. Therefore, to realize their investment returns as early as possible, VCs will shorten the equity duration before the IPO and sell their equity as soon as possible after the expiration of the lock-up period. If the pre-IPO duration is not long enough, it is hard for VCs to establish a relationship with the portfolio firm and to be involved in its operations and management during the IPO (Cao, 2009). However, our results show that in about 41% of portfolio firms, the lead VCs hold equity for less than 2 years pre-IPO and in about 10% of cases for less than 1 year. For example, Huijin Lifang and Jinshi Investment were the two venture capital firms that supported Shenzhou Taiyue. The duration of both companies' pre-IPO equity holding was 165 days. Furthermore, selling equity immediately after the IPO can be a convincing interpretation of the opportunism of VC participation in the IPO. We find that almost 21% of VC-backed firms incur equity selling immediately after the expiration of the lock-up period. For example, Tongzhou Electronics held its IPO on June 27, 2006, but incurred equity selling by Dachen Venture, its VC investor, on June 27, 2007 – the exact date that the lock-up period expired. The same thing happened with Western Material: on the first day after the expiration of the lock-up period, its VC, Shenzhen Innovation Investment, cashed in some of its equity.

The governance role played by the media in China's capital market has been well documented (Li and Shen, 2010; Yu et al., 2010). The publicity given to the success stories of VC-backed entrepreneurs encourages more entrepreneurs to seek help from venture capitalists. Entrepreneurs will favor VCs with better reputations. Accordingly, VCs have an incentive to provide value-added services to portfolio firms to establish their professional reputation. Furthermore, some foreign-owned VCs use their previous investment experience to monitor the portfolio firms before and after the IPO, so that they can play a certification/monitoring role.

The above two forces will have opposite effects on the participation of VCs in an IPO, and will also have different effects on the accounting information quality of IPO companies. As the above analysis shows, the lock-up period in China's market means that VCs sell their equity after the expiration of the lock-up period, thus the key processes in the effect of VC participation on accounting information quality include the IPO and the expiration of the lock-up period. The pattern of portfolio firms' IPO earnings management changes accordingly.

If certification/monitoring is dominant, VCs will not only inhibit earnings management before and during the IPO to enhance accounting information quality and reduce the conflict between inside and outside investors, but they will also certify and monitor the portfolio IPO firms and inhibit the earnings management induced by the insider trading of management and other non-controlling stakeholders after the expiration of the lock-up period. However, if moral hazard is dominant, VCs will inevitably pay less attention to the IPO process, because the relevance of the relationship between the IPO price and the VC's investment return decreases during the lock-up period, and focus more on equity selling after the expiration of the lock-up period. Due to the interaction between accounting earnings in consecutive periods, VCs will treat the IPO and the expiration of the lock-up period as a whole and design a dynamic earnings management strategy. In order to reverse accounting earnings in the year in which the lock-up period expires, the earnings management of

VC-backed companies before the expiration of the lock-up period will not be higher than that of non-VC-backed firms. Because VCs in China's market tend to select firms with high growth and excellent financial performance (Bruton and Ahlstrom, 2003), the appropriate reduction in accounting earnings before and during the IPO will not have a significant effect on IPO pricing. Meanwhile, improvements in the IPO regulatory system have increased the cost of earnings management (Xu and Chen, 2009). Thus, the earnings management of VC-backed firms before the lock-up period expires will be even lower than that of non-VC-backed firms. Based on the above analysis, we propose our first hypotheses.

Hypothesis 1. The participation of VCs will influence earnings management before and after the expiration of the lock-up period.

Hypothesis 1a. The participation of VCs will reduce earnings management before the expiration of the lock-up period (i.e., 1 year before the IPO and the IPO year itself) and the year in which the lock-up period expires (i.e., 1 year after the IPO).

Hypothesis 1b. The participation of VCs will increase earnings management in the year of the lock-up period expiration (i.e., 1 year after the IPO) and reduce earnings management before the expiration of the lock-up period (i.e., 1 year before the IPO and the year of the IPO itself).

In China, state-owned enterprises have a natural relationship with banks, which gives them advantages in accessing bank loans. In a survey of rural commercial banks in Jiangsu and Zhejiang provinces, Brandt and Li (2003) show that banks treat enterprises with different types of ownership differently when awarding bank loans, indicating "financial discrimination." Fang (2010) compares state-owned industrial enterprises and foreign-funded industrial enterprises, and further documents the existence of "financial discrimination" in the process of allocating bank loans. The result of financial discrimination is that non-state-owned enterprises in need of funding find it more difficult to obtain bank loans, thus increasing the demand for funds. Under this circumstance, VCs that can provide development funds to non-state-owned enterprises will have stronger bargaining power in their negotiations with them. Meanwhile, Chemmanur and Loutskina (2007) find that VCs help to market their portfolio firms to analysts, investment banks and institutional investors. We believe that non-state-owned enterprises with fewer political connections have a stronger need for the marketing power of VCs during the IPO process, thus further increasing the bargaining power of VCs. Therefore, VCs will have a more significant influence on the corporate governance, operations and financial behavior of non-state-owned enterprises than on state-owned enterprises.

According to Hao et al. (2011), during the 30 years since China's reform and opening-up, state-owned enterprises have experienced the decentralization reform, contracting reform, joint-stock pilot, and modern enterprise system reform. They have developed into new state-owned enterprises with "clear property rights, well-defined power and responsibility, separation of political function and business operation, scientific management." The governance structure of state-owned enterprises has further improved, especially since the establishment of the State-owned Assets Supervision and Administration Commission in 2003. Using enterprises in Shandong Province from 2002 to 2009 as their sample, they show that the total governance efficiency[3] of state-owned enterprises, with the exception of enterprises wholly owned by the state, is better than that of non-state-owned enterprises and foreign enterprises. Gao and Cai (2011) also find the financial governance of state-owned listed companies to be significantly better than that of non-state-owned listed companies. Therefore, we argue that the more robust system in new state-owned enterprises inhibits the negative effect of VC participation on enterprises under the new regulatory environment. This leads to our second hypothesis.

Hypothesis 2. VC participation has a greater effect on earnings management before and after the lock-up period for non-state-owned enterprises than for state-owned enterprises.

[3] In their paper, total enterprise governance efficiency is measured as the sum of operational efficiency aimed at making profits and functional efficiency for the purpose of maximizing social welfare.

3. Research design

3.1. Sample selection

As the lock-up period for most VCs is 1 year according to the CSRC, we select 1 year after IPO as the year of the expiration of the lock-up period (referred to as the post-IPO year). Because accruals in the year before IPO and the IPO year provide a valid test of earnings management (Teoh et al., 1998; Ball and Shivakumar, 2008), we use discretionary accruals in these 2 years as our measure of accounting information quality before the expiration of the lock-up period. We use a sample of 323 companies that held their IPO on the Shenzhen Small and Medium Enterprises Board (SME Board) and the Growth Enterprise Market (GEM) between 2005 and 2009. We delete IPO firms with the two-digit SIC code C2 because there are fewer than 10, making it hard to get an appropriate estimation of discretionary accruals. We also delete one other company with missing financial data. Finally, we have a sample size of 320 companies in each firm year. We obtain detailed VC data by checking the information from the CV-source with the prospectus, obtain financial data from the Wind database, prospectus and annual reports, and the rankings of underwriters and auditors from the website

Table 1
Sample selection.

	2005	2006	2007	2008	2009	Total
Panel A: Sample selection						
IPO companies	11	56	101	65	90	323
Less: data missing	0	0	1	0	0	1
SIC code C2	0	0	0	2	0	2
Final sample	11	56	100	63	90	320

	VC-backed	Non-VC-backed	Total	VC-backed (%)
Panel B: VC-backing				
2005	2	9	11	18.18
2006	13	43	56	23.21
2007	28	72	100	28.00
2008	19	44	63	30.16
2009	50	40	90	55.56
Total	112	208	320	35.00

	VC-backed	%	Non-VC-backed	%	Total	%
Panel C: Industry distribution						
A – Agriculture, forestry, animal husbandry and fishery	2	1.79	5	2.40	7	2.19
B – Mining	1	0.89	2	0.96	3	0.94
C0 – Food and beverage	3	2.68	7	3.37	10	3.13
C1 – Textiles, clothing, fur	1	0.89	13	6.25	14	4.38
C3 – Papermaking, printing	3	2.68	10	4.81	13	4.06
C4 – Oil, chemical, rubber, plastic	6	5.36	30	14.42	36	11.25
C5 – Electronics	16	14.29	15	7.21	31	9.69
C6 – Metal and non-metal	11	9.82	20	9.62	31	9.69
C7 – Machinery, equipment, instruments	32	28.57	35	16.83	67	20.94
C8 – Pharmaceutical, bio-products	5	4.46	10	4.81	15	4.69
C9 – Other manufacturing	2	1.79	8	3.85	10	3.13
D – Electric, gas, water production and supply	0	0.00	2	0.96	2	0.63
E – Architecture	2	1.79	6	2.88	8	2.50
F – Transportation, warehousing	1	0.89	2	0.96	3	0.94
G – Information technology	20	17.86	17	8.17	37	11.56
H – Wholesale and retail trade	2	1.79	7	3.37	9	2.81
J – Real estate	1	0.89	5	2.40	6	1.88
K – Social services	4	3.57	10	4.81	14	4.38
L – Communication and culture	0	0.00	3	1.44	3	0.94
M – Comprehensive	0	0.00	1	0.48	1	0.31
Total	112	100	208	100	320	100

of the industry committee. Panel A of Table 1 reports the sample selection process, Panel B shows the VC-backing frequency and Panel C shows the industry distribution.

Panel A of Table 1 shows that the stock market boom in 2007 led to 101 IPOs in that year, which was the highest number during the five consecutive sample years. The second highest was 90 IPOs in 2009, the year that China launched GEM. Panel B reports the descriptive results for the number of sample firms that received VC-backing. It seems that VCs participated actively in the capital market, with one third of IPOs backed by VCs. The percentage of firms backed by VCs increased throughout the period, reaching 55.56% in 2009. According to Panel C, VCs give more support to the electronics industry, the machinery, equipment and instrument industry, and the information technology industry. The percentages of VC-backed sample firms in these three industries are 16%, 28.57% and 17.86% respectively, and the proportions in the overall sample are 9.69%, 20.94% and 11.56%.

3.2. Research design

According to Katz (2009), we use the following model to test the effect of VC participation on the earnings management of IPO firms:

$$DA_t = \alpha_0 + \alpha_1 VC_t + \alpha_2 Size_t + \alpha_3 Growth_t + \alpha_4 Leverage_t + \alpha_5 Qratio_t + \alpha_6 Age + \alpha_7 \text{ind\_adj\_cash} + \alpha_8 D\_AuditQuality_t + \alpha_9 D\_UnderwriterQuality_t + \varepsilon_t \quad .$$

In Model (1), the dependent variable DA_t represents the discretionary accruals of IPO firms in year t. We use a cross-sectional modified Jones model to calculate DA_t. To obtain DA_t, we first use the listed companies in the same industry as each IPO sample firm to estimate the parameters in the following equation:

$$\frac{ACC_t}{A_{t-1}} = \beta_1 \frac{1}{A_{t-1}} + \beta_2 \frac{\Delta REV_t - \Delta REC_t}{A_{t-1}} + \beta_3 \frac{PPE_t}{A_{t-1}},$$

where $ACC_t = NI_t - CFO_t$, ACC_t is total accruals in year t, NI_t is total income in year t, CFO_t is net cash flow from operations; A_{t-1} is total assets in year $t-1$; ΔREV_t is change in sales between year t and year $t-1$; ΔREC_t represents the change in account receivables from $t-1$ to t; PPE_t is total fixed assets in year t; and ε_t is the residual. We then insert the estimated coefficients $\hat{\beta}_1$, $\hat{\beta}_2$ and $\hat{\beta}_3$ into the following equation, to obtain the non-discretionary accruals (NDA_t) of sample firms in year t:

$$NDA_t/A_{t-1} = \hat{\beta}_1(1/A_{t-1}) + \hat{\beta}_2[(\Delta REV_t - \Delta REC_t)/A_{t-1}] + \hat{\beta}_3(PPE_t/A_{t-1}).$$

Next, we calculate the total accruals of sample firms in year t: $ACC_t = NI_t - CFO_t$.

Finally, we obtain the discretionary accruals (DA_t) of sample firms in year t using the following equation:

$$DA_t/A_{t-1} = \varepsilon_t = ACC_t/A_{t-1} - NDA_t/A_{t-1}.$$

The dummy variable VC is the key variable. If a sample firm is supported by VC, VC equals 1, otherwise 0. In this model, if the pre-IPO year and the IPO year regression results show that the coefficient α_1 is significantly negative or not significant and the coefficient α_1 in the post-IPO year is significantly positive, then VCs' moral hazard is dominant. On the contrary, if the α_1 coefficients in the three regressions are all significantly negative, the VCs' certification/monitoring role is dominant.

Because financial performance is a key factor in IPO decisions and whether a company can get support from a VC is determined by its financial performance, performance-matched discretionary accruals can control for the systematic difference between the performance of VC-backed and non-VC-backed IPO firms. Thus, performance-matched discretionary accruals are more relevant in this study. We also calculate performance-matched discretionary accruals (Kothari et al., 2005) to measure earnings management, in accordance with Morsfield and Tan (2006). Performance-matched discretionary accruals are calculated as follows: first, we obtain the ROA of each listed company for each year from 2005 to 2009; and second, we match each sample firm with a non-IPO firm with the same one-digit SIC[4] code and that has the closest ROA to the sample firm.

[4] For each sample firm in industries with the SIC code C, we select an ROA-matched firm from the sample firms with the same two-digit SIC.

We then calculate the performance-matched discretionary accruals as the difference between the discretionary accruals of each IPO firm and the discretionary accruals of the matched firm.

In addition, we control for a number of factors that may affect earnings management, including the size of the IPO company, growth, financial leverage, quick ratio, cash flow performance, ownership and the reputations of the IPO auditors and the underwriter. Our reasoning is as follows. First, because firms with high growth may lack cash, accruals and discretionary accruals in these firms may be larger. Second, firms with higher financial leverage receive more monitoring from debtors, so their earnings management will be lower. Third, the quick ratio represents short-term financial flexibility; firms with more financial flexibility may have more cash and lower accruals, and this will further influence their discretionary accruals. Fourth, given that net income is constant, the adequacy of cash flow directly affects the level of accruals, thus affecting the level of discretionary accruals. Fifth, accounting information quality will be better if the company is audited by more reputable auditors, and the underwriter's reputation may influence the choice of auditor. Seventh, different ownership may also affect earnings management, as documented in previous studies. Finally, firm size can proxy for a firm's resources to influence accounting earnings.

We recognize that Model (1) does not control for the endogeneity problem arising from sample self-selection, because a VC's choice to invest in a certain firm may not be random. The control variables in Model (1) cannot reflect this tendency. Therefore, even when earnings management has no relationship with VC participation, the regression result may still show that VC participation has a significant effect on earnings management, and vice versa.

For example, we assume the following equation:

$$Y = \beta \cdot X + \delta \cdot C + \varepsilon,$$

where Y represents earnings management, C is a dummy variable that equals 1 for listed companies that receive VC support and 0 otherwise, and X is a proxy for all other factors that may influence earnings management. Because the decision of a VC is based on a number of factors, we use a related model to reflect this decision:

$$C^* = \gamma \cdot W + \upsilon,$$

where C^* is an unobserved latent variable. The decision we observe is $C = 1$, if $C^* > 0$, otherwise $C = 0$.

If this sample self-selection problem exists, the coefficient δ we estimate by OLS will not measure the effect of the participation of VCs appropriately. In empirical studies, this self-selection problem can be solved by using a treatment effect model (Greene, 2003).

We use a self-selection model to control for this potential endogeneity problem. Specifically, the participation of VCs may be affected by sales per share, net assets per share, total assets per share and other financial factors of portfolio firms (Morsfied and Tan, 2005). It may also be influenced by industry factors, as VCs tend to invest in firms in high-tech industries (Lee and Wahal, 2004). Therefore, we use a dummy variable to capture whether the sample firms are in a high-tech industry. Finally, according to Lerner (1995), VCs tend to invest in firms close to their geographical location to reduce their costs. Because VCs in China are concentrated in Beijing, Guangdong, Jiangsu and Zhejiang, a dummy variable is used to proxy for whether the sample firms are registered in such provinces. We regress VC on the above five variables to estimate the self-selection model.

Table 2 shows the definitions of the variables used in this paper.

4. Empirical results

4.1. The participation of VCs in earnings management of IPO firms

Table 3 shows the descriptive statistics for the independent and control variables. In summary, both discretionary accruals estimated by a cross-sectional modified Jones model and performance-matched discretionary accruals in the pre-IPO, IPO and post-IPO years tend to increase at first and then decline. They peak in the IPO year and are higher in the post-IPO year than in the year before the IPO. Discretionary accruals estimated by a cross-sectional modified Jones model are positive in all three consecutive years, significant at the 5%, 1%

Table 2
Variable definitions.

Variable name	Definition
Dependent variables	
DA	Discretionary accruals in year t, estimated by a cross-sectional modified Jones model
Performance-match_da	Following Kothari et al. (2005), the difference between the discretionary accruals of the sample firm and that of a ROA-matched firm in year t
Independent variable	
VC	Dummy variable that equals 1 if the firm receives VC support, otherwise 0
Control variables	
Control	Dummy variable representing the ownership of the controlling shareholder in year t, equal to 1 if controlled by a non-state entity, otherwise 0
Size	Firm size, equal to ln(total assets) in year t
Growth	Growth rate, calculated as the change in sales between year t and year $t-1$
Leverage	Asset-liability ratio, calculated as total liabilities divided by total assets in year t
Qratio	Quick ratio, calculated as quick assets divided by current liabilities in year t
Age	The number of years between the year in which a portfolio firm was founded and its IPO year
Ind_adj_cash	Dummy variable that equals 1 if the amount of cash flow in year t is larger than the median cash flow of the same industry, otherwise 0
D_auditquality	Dummy variable representing the audit quality of portfolio firms, equal to 1 if ranked in the top 10, otherwise 0
D_underwriterquality	Dummy variable representing IPO underwriter quality, equal to 1 if ranked in the top 10, otherwise 0

and 1% levels, respectively. However, only performance-matched discretionary accruals in the IPO year are positive at the 1% significance level. Performance-matched discretionary accruals are negative in the pre-IPO year and positive in the post-IPO year. In summary, we conclude that sample firms manage earnings during the IPO process, especially in the year of the IPO and the year in which the lock-up period expires.

Except for controlling shareholders, the lock-up period for other insiders, including management, is 1 year in China. For firms listed in the first half of the year, accounting earnings at the end of the IPO year will directly influence the selling price, so they have an incentive to increase accounting earnings in the IPO year. However, for those listed in the second half of the year, accounting earnings in the year following the IPO will have more of an effect. Therefore, to analyze the incentives of earnings management in the IPO year and the following year, we further divide our sample into two subsamples according to whether they were listed in the first or second half of the year. We also define a firm as having high earnings management if its discretionary accruals are above the sample median. We then investigate the relationship between earnings management and the time of listing. We find that in the IPO year, for firms listed in the first half of the year, the proportion of high earnings management firms – measured by discretionary accruals estimated by a cross-sectional modified Jones model (performance-matched discretionary accruals) – is 61.9% (58.65%). For firms listed in the second half of the year, the proportion is 43.98% (45.83%) and the difference is significant at the 1% (5%) level. In the year of the lock-up period expiration, the proportion of firms defined as having high earnings management – measured by discretionary accruals estimated by the cross-sectional modified Jones model – is 43.26%. For firms listed in the second half of the year, the proportion is 53.24% and the difference is significant at the 10% level. The results for performance-matched discretionary accruals show the same pattern: the proportion of firms listed in the first half of the year that are defined as having high earnings management is 48.07%, compared with 50.92% for firms listed in the second half of the year, although the difference is not significant.[5] Thus, we document the influence of the lock-up period on earnings management.

We further compare the earnings management of VC-backed and non-VC-backed firms. We find that, similar to the results for the full sample, both discretionary accruals estimated by the cross-sectional modified Jones model and performance-matched discretionary accruals for VC-backed firms and non-VC-backed firms tend to increase first and then decline, reaching their highest point in the IPO year. Specifically, for

[5] Due to space limitations, we do not report this result.

Table 3
The effect of VCs on portfolio firms. This table presents the results for the effect of VC participation on portfolio firms. DA is the discretionary accruals in the pre-IPO year, the IPO year and the post-IPO year, estimated by a cross-sectional modified Jones model; performance-match_da represents the difference between the discretionary accruals of the sample firm and that of a ROA-matched firm in the pre-IPO year, the IPO year, and the post-IPO year, according to Kothari et al. (2005); Size is the ln(assets) in year t; Growth is the rate of sales growth, calculated as the change in sales between year t and $t-1$; Leverage is the assets–liability ratio, defined as total liability/total assets; Qratio is the quick ratio, defined as quick assets/current liabilities; Age is calculated as the number of years from the founding of a portfolio firm to its IPO year; Ind-adj_cash is a dummy variable that equals 1 if the amount of cash flow in year t is larger than the median cash flow of the same industry, otherwise 0; D_Auditquality is a dummy variable representing the audit quality of portfolio firms; it equals 1 if ranked in the top 10, otherwise 0; D_underwriterquality is a dummy variable representing IPO underwriter quality; it equals 1 if ranked in the top 10, otherwise 0.

	Year	Total sample (320)		VC-backed (112)		Non-VC-backed (208)		Difference
		Mean	S.D.	Mean	S.D.	Mean	S.D.	(t-value)
DA (t-value)	−1	0.019** (2.418)	0.139	0.013 (0.867)	0.164	0.022** (2.529)	0.123	−0.5
	0	0.063*** (7.234)	0.155	0.053*** (3.943)	0.143	0.067*** (6.061)	0.161	−0.779
	1	0.020*** (2.995)	0.12	0.023 *** (3.357)	0.073	0.019* (1.911)	0.139	0.34
Performance-match_da (t-value)	−1	−0.013 (−1.359)	0.17	−0.020 (−1.075)	0.201	−0.009 (−0.848)	0.151	−0.578
	0	0.048*** (4.846)	0.171	0.043*** (2.648)	0.176	0.050*** (4.057)	0.178	−0.03
	1	0.001 (0.057)	0.302	0.010 (1.092)	0.099	−0.005 (−0.401)	0.171	0.851
Size	−1	19.950	0.773	19.778	0.6708	20.043	0.81	−2.951***
	0	20.648	0.670	20.616	0.623	20.666	0.694	−0.626
	1	20.808	0.705	20.768	0.677	20.83	0.721	−0.743
Growth	−1	0.319	0.331	0.370	0.405	0.292	0.281	2.017 **
	0	0.279	0.425	0.296	0.544	0.27	0.345	0.535
	1	0.253	0.355	0.268	0.274	0.245	0.393	0.548
Leverage	−1	0.519	0.156	0.484	0.152	0.538	0.154	−3.001***
	0	0.314	0.176	0.273	0.161	0.336	0.18	−3.100***
	1	0.341	0.18	0.305	0.168	0.361	0.184	−2.689***
Qratio	−1	1.143	0.88	1.411	1.126	0.999	0.673	4.090***
	0	4.096	5.831	5.132	6.036	3.539	5.654	2.347**
	1	3.217	4.962	4.159	6.591	2.710	3.730	2.511**
Ind_adj_cash	−1	0.275	0.447	0.259	0.44	0.284	0.452	−0.471
	0	0.272	0.446	0.259	0.44	0.279	0.45	−0.381
	1	0.281	0.45	0.227	0.421	0.309	0.463	−1.546
Age	0	3.139	0.336	3.078	0.364	3.172	0.316	−2.407**
D_audit_quality	0	0.253	0.436	0.188	0.392	0.289	0.454	−1.987**
D_underwriter_quality	0	0.459	0.499	0.545	0.500	0.414	0.494	2.257**

Note:
* 10% Significance level.
** 5% Significance level.
*** 1% Significance level.

discretionary accruals estimated by a cross-sectional modified Jones model, the earnings management of VC-backed firms is significantly positive in both the IPO year and the post-IPO year, and is higher in the post-IPO year (the year of the lock-up period) than in the pre-IPO year. Although the earnings management of non-VC-backed firms is significantly positive in all three consecutive years, it is lower in the post-IPO year than in the pre-IPO year. The earnings management pattern of VC-backed firms is also similar for performance-matched discretionary accruals. It is significantly positive in the IPO year, not significantly negative in the pre-IPO year and positive in post-IPO year. The pattern of earnings management of non-VC-backed firms is slightly different. It is significantly positive in the IPO year and not significantly negative in the pre-IPO or the post-IPO year. In summary, the results of the discretionary accruals estimated by a cross-sectional modified Jones model and performance-matched discretionary accruals show that earnings

management is lower in VC-backed than non-VC-backed firms before the expiration of the lock-up period, but the earnings management of VC-backed firms reverses after the expiration of the lock-up period. The earnings management of VC-backed firms is higher than that of non-VC-backed firms in the year the lock-up period expires, although not significantly.

The size of VC-backed firms is smaller in all 3 years. The difference is significant at the 1% level in the pre-IPO year, but not significant in the other 2 years. The growth rate of VC-backed firms is higher in all 3 years, especially in the pre-IPO year, at the 5% significance level. Meanwhile, VC-backed firms are younger at the 5% significance level. This finding is in accordance with the Grandstanding hypothesis proposed by Gompers (1996), which suggests that to signal their IPO performance, younger VCs tend to take younger portfolio firms to IPO. VC-backed firms also have more reputable underwriters. The reputations of VC-backed firms are higher than those of non-backed firms at the 5% significance level, in accordance with the findings of Chemmanur and Loutskina (2007). This implies that VCs help portfolio firms with IPO marketing in China's market. However, the reputations of their auditors are lower than those of non-VC-backed firms, because VCs tend to choose lower quality auditors for the convenience of earnings management.

Finally, due to the support of VCs, the IPO firms backed by VCs have higher financial flexibility, more short-term and long-term solvency, significantly lower financial leverage in the pre-IPO and the IPO year, and a higher quick ratio in all 3 years, significant at the 1%, 1% and 5% levels respectively, and less adequate operational cash flow.

4.2. Regression results

The regression results for Hypothesis 1, reported in Table 4, show that for all 3 years, VC has no significant effect on earnings management as measured by discretionary accruals (estimated by a cross-sectional modified Jones model) and performance-matched discretionary accruals, without controlling for the sample self-selection problem. The regression coefficients of discretionary accruals estimated by a cross-sectional modified Jones model (performance-matched discretionary accruals) on VC, α_1, are -0.014 (-0.009) and -0.014 (-0.007) in the pre-IPO and the IPO year, respectively, and 0.012 (0.024) in the post-IPO year. All of these are non-significant, after controlling for sample firms' characteristics and underwriter and auditor reputation. However, if we consider the pattern over the 3 years, we can conjecture that VCs in China's market tend to influence the management of portfolio firms by lowering earnings management before the expiration of the lock-up period. By reversing accounting earnings in the post-IPO year, they will realize higher investment returns when they cash in their equity at the end of the lock-up period. Thus, moral hazard plays a more important role than the certification/monitoring role.

The fifth to seventh and tenth to thirteenth column report the second-stage regression results of the treatment effect model, controlling for the sample self-selection problem. Due to space limitations, we do not report the first-stage probit regression results. In general, the overall LR chi^2 of the regressions are 49.8, 50.33 and 49.56 for the 3 years, respectively. They are all significant below the 1% level and the Pseudo R^2 are 12.23%, 12.36% and 12.17% respectively. In all three probit regressions, the dummy variables – high-tech and geographical location – are significantly positive below the 5% level.

After controlling for the sample self-selection problem, the significance of the overall equation improves. In particular, in the regression for the post-IPO year, with performance-matched discretionary accruals as the dependent variable, the overall significance of the equation changes from insignificant to significant at the 10% level. The second-stage results show that VC participation affects the earnings management pattern before and after the expiration of the lock-up period. In the regression of discretionary accruals estimated using a cross-sectional modified Jones model, the regression coefficients α_1 remain insignificantly negative in the pre-IPO year and the IPO year, whereas the α_1 coefficient is 0.102 in the year the lock-up period expires and is significant at the 5% level. In the regression with performance-matched discretionary accruals as the dependent variable, the regression coefficient α_1 in the pre-IPO year is -0.136, significant at the 5% level. In the IPO year, the earnings management of VC-backed companies is still less than that of non-VC-backed firms. However, the difference is not significant, due to the increased earnings management by the firms listed in the first half of the year to boost accounting earnings after the expiration of the lock-up period. In the year the lock-up period expires, the participation of VCs has a significant effect on the earnings management of

Table 4
The effect of the participation of VCs on earnings management. This table reports the regression results for VC participation on the earnings management of IPO firms in the pre-IPO year, the IPO year and the post-IPO year. DA is the discretionary accruals in the pre-IPO, the IPO, and the post-IPO year, estimated by a cross-sectional modified Jones model; Performance-match_da represents the difference between the discretionary accruals of the sample firm and that of a ROA-matched firm in the pre-IPO year, the IPO year, and post-IPO year, according to Kothari et al. (2005); Control is a dummy variable representing the ownership of controlling shareholders in year t, which equals 1 if controlled by a non-state entity; Size is the ln(assets) in year t; Growth is the rate of sales growth, calculated as the change in sales between year t and year $t-1$; Leverage is the assets-liability ratio, defined as total liability/total assets; Qratio is quick ratio, defined as quick assets/current liabilities; Age is calculated as the number of years from the founding of portfolio firms to their IPO year; Ind-adj_cash is a dummy variable, which equals 1 if the amount of cash flow in year t is larger than the median cash flow of the same industry, otherwise 0; D_Auditquality is a dummy variable representing the audit quality of portfolio firms, which equals 1 if ranked in the top 10, otherwise 0; D_underwriterquality is a dummy variable representing IPO underwriter quality, which equals 1 if ranked in the top 10, otherwise 0.

	DA			DA (controlling for self-selection)			Performance-match_da			Performance-match_da (controlling for self-selection)		
	Pre-IPO year	IPO year	Post-IPO year	Pre- IPO year	IPO year	Post-IPO year	Pre-IPO year	IPO year	Post-IPO year	Pre-IPO year	IPO year	Post-IPO year
VC (t-value/z-value)	−.014 (−0.89)	−.014 (−0.82)	0.012 (0.85)	−0.065 (−1.42)	−0.067 (−1.34)	0.102** (2.35)	−.009 (−0.49)	−.007 (−0.39)	.024 (1.35)	−0.136** (−2.28)	−0.091 (−1.52)	0.086* (1.69)
Control (t-value/z-value)	.016 (0.9)	.038* (1.94)	0.041** (2.48)	0.030 (1.58)	0.045** (2.19)	0.037** (2.13)	.015 (−0.68)	.015 (0.67)	.028 (1.36)	0.001 (0.03)	0.026 (1.10)	0.028 (1.30)
Size (t-value/z-value)	.039*** (2.78)	.042*** (2.98)	0.016 (1.46)	0.036*** (2.66)	0.042*** (2.91)	0.012 (1.11)	.038** (2.23)	.050*** (2.95)	.019 (1.42)	0.035** (2.08)	0.052*** (2.98)	0.015 (1.09)
Growth (t-value/z-value)	.037 (1.62)	−.003 (−0.17)	−0.065*** (−3.40)	0.010 (0.45)	−0.005 (−0.30)	−0.071*** (−3.74)	.039 (1.36)	−.025 (−1.08)	−.055** (−2.29)	0.020 (0.70)	−0.029 (−1.27)	−0.061** (−2.52)
Leverage (t-value/z-value)	−.176** (−2.13)	−.002 (−0.04)	0.009 (0.18)	−0.174** (−2.09)	−0.009 (−0.14)	0.030 (0.57)	−.070 (−0.69)	−.034 (−0.44)	.023 (0.36)	−0.087 (−0.83)	0.049 (−0.61)	0.037 (0.56)
Qratio (t-value/z-value)	−.002 (−0.19)	−.003* (−1.92)	−0.001 (−0.46)	0.0001 (0.00)	−0.002* (−1.74)	−0.001 (−0.86)	.010 (0.66)	−.004* (−1.96)	−.001 (−0.27)	0.016 (1.08)	−0.003* (−1.68)	−0.001 (−0.48)
Age (t-value/z-value)	.013 (0.55)	.024 (0.97)	0.029 (1.39)	0.002 (0.10)	0.022 (0.92)	0.033 (1.60)	.068** (2.34)	.009 (0.31)	.026 (1.00)	0.057* (1.95)	0.006 (0.22)	0.029 (1.11)

Ind_adj_cash (*t*-value/*z*-value)	−.116***	−.151***	0.014	−0.119***	−0.155***	0.009	−.132***	−.140***	.016	−0.133***	−0.149***	0.012
	(−6.37)	(−7,89)	(1.01)	(−6.63)	(−8.11)	(0.62)	(−5.90)	(−6.09)	(0.87)	(−6.02)	(−6.51)	(0.69)
D_Auditquality (*t*-value/*z*-value)	−.033*	−.024	−0.006	−0.031*	−0.018	−0.008	−.032	−.019	−.006	−0.025	−0.016	−0.010
	(−1.957)	(−1.31)	(−0.40)	(−1.84)	(−0.98)	(−0.56)	(−1.52)	(−0.90)	(−0.34)	(−1.19)	(−0.73)	(−0.52)
D_underwriterquality (*t*-value/*z*-value)	−.005	.015	−0.026*	−0.005	0.013	0.022*	−.015	.033*	−.036*	−0.016	0.028	−0.035**
	(−0.38)	(0.98)	(−1.89)	(−0.35)	(0.82)	(−1.69)	(−082)	(1.73)	(−2.1)	(−0.88)	(1.48)	(−2.04)
Constant (*t*-value/*z*-value)	−.683***	−.855***	−0.417*	−0.593**	−0.837**	−0.389	−.915***	−.962***	−.503	−0.790**	−0.966***	−0.447
	(−2.61)	(−2.90)	(−1.79)	(−2.29)	(−2.81)	(−1.64)	(−2.85)	(−273)	(−1.72)	(−2.43)	(−2.70)	(−1.50)
N	320	320	320	320	320	320	320	320	320	320	320	320
F (Wald chi^2)	4.92***	8.29***	2.33**	53.51	87.31	28.4	4.93***	4.93***	1.44	55.15	55.12	16.61
Adjust R^2 (Prob > chi^2)	10.95%	18.60%	3.72%	0.000	0.000	0.002	10.96%	10.96%	1.37%	0.000	0.000	0.083

Note:
* 10% Significance level.
** 5% Significance level.
*** 1% Significance level.

portfolio firms, with the earnings management of VC-backed firms higher than that of non-VC-backed firms at the 10% significance level.

In addition, unreported results show that the ROA (industry-median-adjusted ROA) of VC-backed firms in the pre-IPO year is 14.2% (11.2%), which is significantly higher than that of non-VC-backed firms – 11.9% (9%) – at the 1% (1%) level. In Table 3, we find that the growth rate of VC-backed firms in the pre-IPO year is 37%, compared with 29.2% for non-VC-backed firms. Therefore, reducing earnings management in the pre-IPO year will not have a significant effect on IPO pricing. If we consider the earnings management from the pre-IPO year to the post-IPO year together, we can infer that the participation of VCs reduces earnings management before the expiration of the lock-up period to reverse accounting earnings in the year the lock-up period expires. For this reason, under our current background, the imperfect market system means that VCs participating in IPOs have no incentive to monitor portfolio firms, their participation is more for speculative purposes. They collude with the management of portfolio firms or put pressure on the management to lower discretionary accruals before the expiration of the lock-up period in return for the reverse in accounting earnings once the lock-up period expires, which ultimately has a negative effect on the market. Thus, our empirical results support the moral hazard hypothesis.

The regression results also show that the earnings management of non-state-owned enterprises is higher than that of state-owned enterprises during the three consecutive years. In particular, in the regression model with discretionary accruals estimated by the cross-sectional modified Jones model as the dependent variable, the coefficients for VC in the IPO year and the post-IPO year are 0.045 and 0.037 respectively, both significant at the 5% level. This implies that the governance of state-owned enterprises is better than that of non-state-owned enterprises, in accordance with Gao and Cai (2011). In addition, larger firms have more resources to manage earnings, so they tend to have higher earnings management. The regression coefficients for discretionary accruals estimated by the cross-sectional modified Jones model (performance-matched discretionary accruals) on firm size in the pre-IPO and the IPO year are 0.036 (0.035) and 0.042 (0.052), significant at the 1% (5%) and 1% (1%) levels. Firms with lower growth rates have more incentive to increase growth by means of earnings management, which is more obvious in the year the lock-up period expires. The regression coefficients for discretionary accruals estimated by the cross-sectional modified Jones model (performance-matched discretionary accruals) on growth are −0.071 (−0.061) respectively, significant at the 1% (5%) level. Furthermore, older firms of lower quality (Xue, 2002) tend to have higher earnings management. The regression coefficient for performance-matched discretionary accruals on age is 0.057, significant at the 10% level in the pre-IPO year. Meanwhile, firms with lower financial leverage receive less monitoring from debtors, which leads to higher earnings management. The regression coefficient for discretionary accruals estimated by the cross-sectional modified Jones model on financial leverage is −0.174, significant at the 5% level in the pre-IPO year. As predicted, firms with worse operational cash flow tend to have higher earnings management. Finally, auditors and underwriters do not inhibit earnings management.

Because VCs increase earnings in the year the lock-up period expires to obtain higher equity selling prices, high earnings management inevitably leads to more frequent equity selling. To test this direct result of earnings management, we analyze equity selling by VCs in the post-IPO year. The results show that 54 firms incur equity selling by VCs in the post-IPO year, accounting for 62.92% of the sample firms with lock-up periods of 1 year. Among them, 18 firms (22.32%) incur equity selling on the day of the expiration of the lock-up period. Thus, the moral hazard hypothesis is further supported.

To investigate whether there is a different effect of VC participation on earnings management for firms with different ownership, we divide the total sample into state-owned and non-state-owned subsamples. The results before controlling for sample self-selection show that in general, the participation of VCs has no significant effect on earnings management.[6] Specifically, when the dependent variable is discretionary accruals estimated by the cross-sectional modified Jones model, the regression results for both state-owned and non-state-owned firms tend to be similar. In the pre-IPO and the IPO year, the participation of VCs has a negative relationship with earnings management, but the relationship turns positive in the post-IPO year, although not significantly. However, in the performance-matched discretionary accruals regression, the participation of VCs has a

[6] Because of space limitations, we do not report this result.

Table 5
The effect of the participation of VCs on earnings management: subsample regressions. This table reports the regression results for VC participation on the earnings management of stated-owned and non-state-owned IPO firms in the pre-IPO year, the IPO year, and the post-IPO year. DA is the discretionary accruals in the pre-IPO, the IPO, and the post-IPO year, estimated by a cross-sectional modified Jones model; Performance-match_da represents the difference between the discretionary accruals of the sample firm and that of a ROA-matched firm in the pre-IPO, the IPO, and the post-IPO year, according to Kothari et al. (2005); Size is the ln(assets) in year t; Growth is the rate of sales growth, calculated as the change in sales between year t and year $t-1$; Leverage is the assets–liability ratio, defined as total liability/total assets; Qratio is the quick ratio, defined as quick assets/current liabilities; Age is calculated as the number of years from the founding of portfolio firms to their IPO year; Ind-adj_cash is a dummy variable, which equals 1 if the amount of cash flow in year t is larger than the median cash flow of the same industry, 1, otherwise 0; D_Auditquality is a dummy variable representing the audit quality of portfolio firms, which equals 1 if ranked in the top 10, otherwise 0; D_underwriterquality is a dummy variable representing IPO underwriter quality, which equals 1 if ranked in the top 10, otherwise 0.

	DA						Performance-match_da					
	1 year before IPO		IPO year		1 year after IPO		1 year before IPO		IPO year		1 year after IPO	
	State-owned	Non-state-owned	State-owned	Non-state-owned	State-owned	Non-state-owned	State-owned	Non-state-owned	State-owned	Non-state-owned	State-owned	Non-state-owned
VC (z-value)	−0.046	−0.074	−0.015	−0.071	0.019	0.131**	−0.076	−0.155**	0.058	−0.062	−0.0003	0.133**
	(−1.15)	(−1.30)	(−0.41)	(−1.12)	(0.41)	(2.44)	(−1.14)	(−2.17)	(1.24)	(−0.85)	(−0.01)	(2.03)
Size (z-value)	0.021	0.042**	0.030*	0.047***	−0.001	0.021	0.028	0.041**	0.022	0.051**	0.042*	0.020
	(1.33)	(2.39)	(1.83)	(2.64)	(−0.08)	(1.56)	(1.11)	(1.96)	(1.13)	(2.48)	(1.81)	(1.17)
Growth (z-value)	0.110***	0.013	−0.019	0.001	−0.008	−0.08***	0.12***	0.006	−0.003	−0.0240	−0.057	−0.058**
	(3.97)	(0.47)	(−0.79)	(0.08)	(−0.18)	(−3.60)	(2.64)	(0.18)	(−0.10)	(−0.91)	(−1.07)	(−2.17)
Leverage (z-value)	−0.140	−0.212*	0.009	0.021	−0.027	0.036	0.003	−0.125	−0.005	−0.060	−0.064	0.050
	(−1.58)	(−1.89)	(0.13)	(−0.24)	(−0.30)	(0.54)	(0.03)	(−0.92)	(−0.06)	(−0.58)	(−0.62)	(0.59)
Qratio (z-value)	0.028	−0.008	−0.009	−0.004*	−0.001	−0.001	0.037	0.011	−0.001	−0.005*	−0.620	−0.001
	(1.61)	(−0.52)	(−1.28)	(−1.66)	(−0.46)	(−0.96)	(1.39)	(0.63)	(−1.16)	(−1.76)	(−0.00)	(−0.66)
Age (z-value)	0.015	0.001	−0.036	0.043	0.019	0.042*	0.084*	0.047	0.070*	0.009	0.780	0.038
	(0.49)	(0.02)	(−1.09)	(1.49)	(0.49)	(1.77)	(1.68)	(1.38)	(1.71)	(0.29)	(0.03)	(0.23)
Ind_adj_cash (z-value)	−0.069***	−0.137***	−0.123***	−0.167***	−0.069**	0.001	−0.106	−0.143***	−0.072***	−0.134***	−0.74***	0.012
	(−3.52)	(5.96)	(−5.61)	(−7.05)	(−2.39)	(0.02)	(−3.47)	(−5.24)	(−2.67)	(−4.90)	(−0.11)	(0.55)
D_auditquality (z-value)	−0.034	−0.031	0.032	−0.038*	0.007	−0.020	0.011	−0.033	0.031	−0.036	0.036	−0.029
	(−1.52)	(−1.46)	(1.40)	(−1.73)	(0.26)	(−1.12)	(0.32)	(−1.34)	(1.08)	(−1.40)	(1.11)	(−1.27)
D_underwriterquality (z-value)	−0.010	0.001	0.019	0.009	−0.014	−0.026*	−0.014	−0.011	0.049**	0.021	−0.010	−0.041**
	(−0.57)	(0.03)	(1.03)	(0.47)	(−0.63)	(−1.68)	(−0.51)	(−0.50)	(2.12)	(0.95)	(−0.41)	(−2.02)
Constant	−0.421	−0.633*	−0.432	−0.948***	0.010	−0.570**	−0.859*	−0.838**	−0.713*	−0.941**	−0.940**	−0.558
(z-value)	(−1.34)	(−1.97)	(−1.33)	(−2.59)	(0.02)	(−2.01)	(−1.71)	(−2.16)	(−1.80)	(−2.23)	(−1.96)	(−1.56)
N	74	246	74	246	74	246	74	246	74	246	74	246
Wald chi^2	38.45	41.29	37.32	72.45	11.43	26.10	27.12	42.05	19.10	37.81	17.89	16.97
Prob > chi^2	0.000	0.000	0.000	0.000	0.247	0.002	0.001	0.000	0.024	0.000	0.037	0.049

Note:
* 10% Significance level.
** 5% Significance level.
*** 1% Significance level.

positive influence on the earnings management of state-owned enterprises in the three consecutive years. For non-state-owned enterprises, VC participation has a negative effect on earnings management in the pre-IPO year, but a positive influence in the other 2 years.

Table 5 shows the second-stage regression results after controlling for sample self-selection. Due to space limitations, we do not report the first-stage probit regression results. The overall LR chi^2 of the three regressions on the state-owned sample are 26.81, 29.45 and 26.32 respectively, all significant below the 1% level. The Pseudo R^2 are 30%, 32.96% and 29.46% respectively. The dummy variables – high-tech and geographical location – are significantly positive below the 1% level in the regressions for each of the 3 years. For non-state-owned enterprises, the overall LR chi^2 for the three regressions are 34.85, 35.49 and 35.36 respectively, all below the 1% level. The Pseudo R^2 are 10.79%, 10.99% and 10.94% respectively. The dummy variables – high-tech and geographical location – are also significantly positive in the regressions for all 3 years and significant below the 1%, 1% and 10% levels.

According to Table 5, in the state-owned sample, the participation of VCs has a weak effect on earnings management in all 3 years. None of the regression coefficients for earnings management on VC α_1 are significant. In the regression of discretionary accruals estimated by the cross-sectional modified Jones model, it seems that VC participation weakly reduces earnings management in the pre-IPO and the IPO year, with the gap between VC-backed and non-VC-backed firms narrowing. In the post-IPO year, the earnings management of VC-backed firms is higher than that of non-VC-backed firms. For the regression of performance-matched discretionary accruals, none of the regression coefficients for earnings management on VC α_1 are significant. VC participation weakly reduces earnings management in the pre-IPO and the post-IPO years, and increases it in the IPO year.

For non-state-owned enterprises, VC participation significantly influences earnings management in the post-IPO year. In the pre-IPO year, VC participation reduces performance-matched discretionary accruals at the 5% significance level and also reduces discretionary accruals estimated by the cross-sectional modified Jones model. Although insignificant, the regression coefficients for discretionary accruals estimated by the cross-sectional modified Jones model (performance-matched discretionary accruals) on VC α_1 are -0.155 (-0.074). In the IPO year, the reduction in earnings management as a result of VC participation is further weakened. The regression coefficients for discretionary accruals estimated by the cross-sectional modified Jones model (performance-matched discretionary accruals) on VC α_1 are -0.071 (-0.062), both not significant. However, in the post-IPO year, the participation of VCs increases the earnings management of portfolio firms and the regression coefficients for discretionary accruals estimated by the cross-sectional modified Jones model (performance-matched discretionary accruals) on VC α_1 are 0.131 (0.133), significant at the 5% (5%) level. Combined with the discussion on Hypothesis 1, we believe that the participation of VCs in non-state-owned enterprises, compared with state-owned enterprises, has more effect on earnings management before and after the expiration of the lock-up period. Therefore, Hypothesis 2 is also supported.

We also conduct the following robustness tests: first, we use the Jones model to estimate earnings management; second, we measure firm size by sales; and third, we use growth in net income as a proxy for the growth of IPO firms. The results are consistent with those reported.

5. Conclusions

We use a sample of IPO firms in the SME Board and GEM between 2005 and 2009, and establish a two-stage treatment effect model to control for the sample self-selection problem. We investigate the participation of VCs in the earnings management of portfolio firms in the year before IPO, the IPO year and the year after IPO. We reach the following conclusions.

(1) To increase accounting earnings in the year in which the lock-up period expires, the participation of VCs lowers earnings management, especially in the pre-IPO year, and increases earnings management in the post-IPO year.
(2) Compared with state-owned IPO companies, the participation of VCs has more effect on earnings management before and after the expiration of the lock-up period in non-state-owned enterprises. In the subsample of state-owned enterprises, VC participation has no significant effect on earnings management

from the pre-IPO year to the post-IPO year. However, for non-state-owned enterprises, the participation of VCs significantly reduces earnings management in the pre-IPO year. This results in a significant reversal in discretionary accruals estimated by the cross-sectional modified Jones model and performance-matched discretionary accruals in the year of the expiration of lock-up period.

Thus, we provide a comprehensive investigation of the effect of the participation of VCs on the accounting information quality of IPO firms before and after the expiration of the lock-up period. We reach the conclusion that under China's current institutional background, the involvement of VCs in IPO firms reflects a moral hazard role rather than a certification/monitoring role. This conclusion is important for the decision making of investors and policymakers. First, due to self-interest, the participation of VCs is more for speculative purposes. They collude with the management of portfolio companies or put pressure on the portfolio firms' management using their own professional advantages and social networks, to reduce earnings management before the expiration of the lock-up period and to reverse accounting earnings after the expiration of the lock-up period. Investors, therefore, should not blindly follow the behavior of VCs. Second, to increase the incentive of VCs to positively monitor their portfolio firms, regulators should not only strengthen the supervision of VCs and establish appropriate punishment mechanisms to regulate their speculative behavior, but should also establish guidance and motivation systems to increase VCs' motivation to obtain investment returns by providing R&D support, help with sales and purchase channels, management improvements and other value-added services. Finally, government should improve the financing environment of non-state-owned enterprises and establish appropriate mechanisms to solve the problem of financing bottlenecks in non-state-owned enterprises so that the negative effects of venture capitalists' involvement in non-state-owned enterprises can be reduced.

As this paper does not test the effect of reputation and other characteristics of VCs on the accounting information quality of IPO firms, this would be an interesting future research direction.

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References

Agrawal, A., Cooper, T., 2009. Accounting Scandals in IPO Firms: Do Underwriters and VCs Help? Culverhouse College of Business, University of Alabama. Working Paper.

Baker, M., Gompers, P., 2003. The determinants of board structure at the initial public offering. Journal of Law and Economics 46, 569–598.

Ball, R., Shivakumar, L., 2005. Earnings quality in UK private firms: comparative loss recognition timeliness. Journal of Accounting and Economics 39, 83–128.

Ball, R., Shivakumar, L., 2008. Earnings quality at initial public offerings. Journal of Accounting and Economics 45, 324–349.

Barry, C., Muscarella, C., Peavy, J., Vetsuypens, M., 1990. The role of venture capital in the creation of public companies: evidence from the going-public process. Journal of Financial Economics 27, 447–472.

Brandt, L., Li, H.B., 2003. Bank discrimination in transition economies: ideology, information or incentives? Journal of Comparative Economics 31, 387–413.

Bruton, G.D., Ahlstrom, D., 2003. An institutional view of china's venture capital industry: explaining the difference between China and the West. Journal of Business Venturing 18, 233–259.

Cao, J.X., 2009. Are Buyout Sponsors Market Timers in RLBO? Singapore Management University. Working Paper.

Cohen, D.A., Langberg, N., 2006. Venture Capital Financing and the Informativeness of Earnings. SSRN Working Paper.

Chemmanur, T.J., Loutskina, E., 2007. The Role of Venture Capital Backing in Initial Public Offerings: Certification. Screening or Market Power. SSRN Working paper.

Chou, D., Gombola, M., Liu, F., 2006. Earnings management and stock performance of reverse leveraged buyouts. Journal of Financial and Quantitative Analysis 41, 407–438.

Darrough, M., Rangan, S.P., 2005. Do insiders manipulate earnings when they sell their shares in an initial public offering? Journal of Accounting Research 43, 1–33.

Hochberg, Y.V., 2003. Venture Capital and Corporate Governance in the Newly Public Firm. AFA 2004 San Diego Meetings.

Gioielli, S.O., Carvalho, D., Antonio, G., 2008. The Dynamics of Earnings Management in IPOs and the Role of Venture Capital. Fundacao Getulio Vargas School of Business. Working Paper.

Gompers, P., 1996. Grandstanding in the venture capital industry. Journal of Financial Economics 42, 133–156.
Greene, W.H., 2003. Econometric Analysis. Prentice Hall Business Publishing, Upper Saddle River, NJ.
Kothari, S.P., Leone, A.J., Wasley, C.E., 2005. Performance matched discretionary accrual measures. Journal of Accounting and Economics 39, 163–197.
Katz, S.P., 2009. Earnings quality and ownership structure: the role of private equity sponsors. Accounting Review 84, 621–658.
Lee, P.M., Wahal, S., 2004. Grandstanding, certification and the underpricing of venture capital backed IPOs. Journal of Financial Economics 73, 375–407.
Lerner, J., 1995. Venture capitalists and the oversight of private firms. Journal of Finance 50, 301–318.
Morsfield, S.G., Tan, C.E.L., 2006. Do venture capitalists influence the decision to manage earnings in initial public offerings? Accounting Review 81, 1119–1150.
Sahlman, W.A., 1990. The structure and governance of venture-capital organizations. Journal of Financial Economics 27, 473–521.
Scott, W.R., 1987. The adolescence of institutional theory. Administrative Science Quarterly 32, 493–511.
Scott, W.R., 1995. Institutions and Organizations. Sage Publications, Thousand Oaks, CA.
Teoh, S.H., Welch, I., Wong, T.J., 1998. Earnings management and the long-run performance of initial public offerings. Journal of Finance 53, 1935–1974.
Wongsunwai, W., 2007. Does Venture Capitalist Quality Affect Corporate Governance? Stanford Graduate School of Business. Working Paper.
Chen, G., Yu, X., Kou, X., 2011. The participation of VCs on the IPO discount of enterprises in China: a comparison of different markets. Economic Research Journal 5, 74–85.
Fang, J., 2010. Are non-state-owned listed company discriminated in bank loan? Management World 11, 123–131.
Gao, M., Cai, W., 2011. Report on the Financial Governance Index of Listed Companies in China. Economic Science Press, BJ.
Hao, S., Tao, H., Tian, J., 2011. A comparison study of the state-owned enterprises of different ownership structures: take Shandong province as example. China Industrial Economic Journal 9, 130–139.
Hu, Z., Bu, Y., 2012. The Effect of Political Connection of Venture Capital on the Possibility of Successful IPO. University of Science and Technology of Beijing. Working Paper.
Li, P., Shen, Y., 2010. The governance effect of media: evidence from China. Economic Research Journal 4, 14–27.
Xu, H., Chen, C., 2009. Accounting earnings quality, IPO pricing and long-term performance: evidence from the IPO after IPO reform. Management World 8, 25–38.
Xue, S., 2002. How are the stock prices of loss listed companies determined? China Accounting and Financial Research 4, 100–115.
Yu, Z., Tian, G., Qi, B., Zhang, H., 2010. The corporate governance mechanism of media focus based on the view of earnings management. Management World 9, 127–140.