

1-1-2011

Venture Capital and Executive Incentives in China

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Recommended Citation

Cao, Jerry; Liu, Qigui; and Tian, Gary G.: Venture Capital and Executive Incentives in China 2011, 1-32.
<https://ro.uow.edu.au/commpapers/2317>

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Keywords

Venture, Capital, Executive, Incentives, China

Disciplines

Business | Social and Behavioral Sciences

Publication Details

Cao, J., Liu, Q. & Tian, G. G. (2011). Venture Capital and Executive Incentives in China. 2011 China International Conference in Finance (pp. 1-32). Wuhan, China: CCFN.

Venture Capital and Executive Incentives in China

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August 2010

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Abstract

This paper examines the effect that venture capital (VC) has on the pay-performance relationship in listed Chinese firms. We find that VC has a significantly positive effect on CEO compensation and the pay-performance relationship, such effect particularly stronger in firms needing more managerial efforts and discretions (higher growth opportunity or higher levels of capital expenditure). In addition, we show that VC-backed firms with more managerial discretions are more likely to use stock options. The evidence suggests that venture capital investors use more sensitive compensation contract for top executives in Chinese when the need for managerial discretion is greater. Such compensation schemes by VCs enhance firm performance subsequently.

Key words: Venture capital; CEO compensation; firm performance

JEL Classification: G32, G34

1. Introduction

Jensen and Meckling (1976) argue that in the separation of control and ownership, managerial equity ownership for cash flow helps to align the interests of the manager and minority shareholders. Managerial equity ownership enhances CEO and executive's incentives, while it also results in the issue of control through entrenchment (Fama, 1980; Holmstrom, 1999). In this situation, managers may expropriate minority shareholders and extract what the private benefits of control (Grossman and Hart, 1988). According to Murphy (1999), the designing of executive compensation contracts to monitor CEOs by the board is the central tenet of internal control mechanism to safeguarding shareholder interests. Jensen and Murphy (1990) show a positive but weak relationship between CEO compensation and firm performance in big listed firms. There is little known whether such relationship holds for small and high-technology firms. While venture capital (VC) ownership in corporations has grown fast over the last few years, especially in China, their importance in monitoring corporate behaviour and executive incentives is still unknown and there is still no evidence that VC affected the pay-performance relationship.

The agency issue could be severer in VC backed firms because to achieve higher returns, VC normally invested in high risky firms with higher growth opportunity and CEOs often have great discretion power. Therefore, how to align the interests of managers and the rest of shareholders like venture capital investors is far more important for VC-backed firms because VCs may have a strong motivation to enhance the pay-performance relationship due to the fact that its compensation is also closely linked to a VC-company's share returns (Gompers and Lerner, 1995).

Extant literature on the pay-performance relationship focuses mainly on the role of corporate governance (Core et al., 1999; Brick et al., 2006) and ownership structure (Kato and Long, 2005; Firth et al., 2006; Barontini and Bozzi, 2010). The effect of VC on the pay-performance relationship is important because VCs usually have a strong incentive to play governance role in the firms they started (e.g. Gompers, 1995; Lerner, 1995; Hellmann and Puri, 2002; Kaplan and Stromberg, 2003; Hochberg, 2008). In this paper we examine the effect of VC on the pay-performance relationship in China's listed firms and conduct our research in China with its specific institutional background for the following reasons.

First, venture capital market in China has grown tremendously in recent decades. China becomes the second largest economy in terms of venture capital related activities such as VC-backed IPOs, fund-raising and entrepreneurial financing. Second, with the establishment of the Small and Medium board (SMEs board in Shengzhen Stock Exchange) in 2004 and the implementation of “The Interim Measures for the Administration of Early-Stage Venture Capital Enterprises” by the Chinese government in 2005, VC companies have emerged and grown very quickly over the past few years. Our sample shows that 59 VC-backed firms went public in the first half of 2010, which accounts for nearly 40 percent of total IPOs in China. Third, unlike developed economies such as the United States and United Kingdom, where there is enough protection for investors and private property (Peng, 2001), the ambiguous institutional market environment in transition economies makes it difficult for VCs to select firms to invest in and effectively monitor those investments through board of directors (Bruton & Ahlstrom, 2003; Pruthi, et al., 2003). Therefore, VCs in Chinese firms may have an even strong incentive to monitor managerial behaviour by tying executive’s compensation to firm performance compared to VCs in developed economies.

This paper makes the several contributions. First, while no previous study has examined the role of VC in the pay-performance relationship, this paper attempts to fill this gap and enlarge the literature on VC and executive incentives. Second, previous studies on the pay-performance relationship of Chinese listed firms only focused on executives’ cash compensation (Kato and Long, 2005; Firth et al., 2006), this current paper also examines the effect of VC on the usage of stock options in compensation package. Yermack (1995) shows that stock options are less used in regulated firms but widely used in firms with noisy accounting measurements and liquidity constraints. Anderson, Banker and Ravindran (2000)’s study of compensation in technology firms suggest that stock and option pay are widely used in US. In China, the employment of stock options is only a recent phenomenon. It is therefore important to investigate whether the presence of venture capital investors has any effect on the likelihood for a firm to adopt stock option as part of CEO compensation scheme. Third, agency theory indicates that firms with higher growth opportunity and higher capital expenditure may have greater agency costs and managerial discretions, so this study especially examines the effect of VC on pay-performance relationship in these firms. Thus this paper also contributes to the literature on agency theory. Finally, we focus on the VC and pay-performance relationship in China’s specific institutional background so this paper also contributes to literature on a transition economy.

Our univariate test results show that VC-backed firms have statistically significantly higher performance and CEO compensation than non-VC-backed firms. Our regression results further show that VC in China has a significant and positive effect on both CEO compensation and the pay-performance relationship. We also find that the interactive term of VC*performance*HIGHG (high growth opportunity) is also significantly positively related to CEO compensation. The results are similar when we use industry-adjusted performance as measures of firm performance. In addition, VC-backed firms with a high growth opportunity (high level of capital expenditure) are more likely to use stock options and a higher CEO compensation in VC-backed firms can also produce a better performance.

The remainder of this paper is organized as follows: section 2 presents literature reviews and develops several testable hypotheses. Section 3 describes how the variables are measured and what methodology was chosen. Section 4 presents our main empirical results and interpretation and section 5 summarizes the main conclusions of the research.

2. Literature Review and Hypotheses

2.1 Literature Review

2.1.1 The relationship between firm performance and CEO compensation

The agency theory developed by Jensen and Meckling (1976) was the first to highlight the agency conflict between managers and shareholders that results from the separation of ownership and control, and also stimulate an interest in executive compensation, considered to be the easiest way to measure how managers could take advantage of lack of control by owners. Most extant literature then examines executive compensation within the agency problem framework. Under this framework, making executive compensation dependent on firm performance is seen as an important measure for reducing agency conflict and aligning the interests of managers and shareholders. A series of empirical studies in the United States have confirmed this positive pay-performance relationship, for example Jensen and Murphy (1990), and Gibbons and Murphy (1992).

In recent years a second line of research on the pay-performance relationship linked pay-performance to corporate governance. For example, Core et al. (1999) examined the relationship between corporate governance, CEO compensation, and firm performance in

United States firms and found that firms with weak corporate governance usually had greater agency problems, worse performance, and better CEO compensation. Brick et al. (2006) found that CEO compensation was positively related to director compensation and that excess compensation to both CEO and director was directly associated with firm under performance.

Another series of studies in recent years investigated whether the pay-performance relationship was affected by the ownership structure. For example, Kato and Long (2005) found that state ownership in China weakened the pay-performance relationship, while Firth (2006) found that direct state ownership and private ownership increased either shareholder wealth or profitability, while the pay-performance relationship in firms with state agency as a major shareholder was insignificant. Studies on West European firms also found that ownership structure had some effect on executive compensation. Elston and Goldberg (2003) found that bank ownership in Germany reduced executive compensation and ownership structures can affect executive compensation practices. Barontini and Bozzi (2010) indicated that the CEO compensation in Italian family firms was higher than non-family firms, and ownership concentration had a negative impact on CEO compensation.

To sum up, recent studies indicate that under an agency problem framework, CEO pay-performance relationship is greatly influenced by a firm's corporate governance and ownership structure, and therefore CEO pay-performance may also be affected by VC because VC is a specific type of ownership that plays an important role in corporate governance.

2.1.2 The role of VC in corporate governance

Extant literature also indicates that VCs usually have strong incentives to monitor the managerial behaviour of the firms they started because their compensation and ability to raise further funds depend on their investment returns, which are determined by the share price when they sell or distribute their stake in their portfolio firms (Hochberg, 2008). Many empirical studies also support this argument, for example Gompers (1995) used a random sample from 1961 to 1992 to show that VCs tend to monitor entrepreneurs more frequently when the agency costs were expected to be high, while Lerner (1995) used a sample of biotechnology firms in America between 1978 and 1989 to show that VCs are important monitors of managers. Hellmann and Puri (2002) stated that VCs play an important role around the time of CEO turnover while empirical research by Kaplan and Stromberg (2003)

on financial contracts showed that VCs were always allowed to have excess control rights at the time of investment and tried very hard to monitor and assist their portfolio companies. Hochberg (2008) empirically investigated IPO firms and stated that VC-backed firms have less earnings management and more independent board structures than non-VC-backed firms.

Overall, extant literature shows that a positive relationship between firm performance and CEO compensation helps to align the interest of managers and shareholders, although this relationship is not always positive due to the weak corporate governance or different shareholder incentives. While the literature on VC indicates that as a specific shareholder, VCs have strong incentives to monitor the managers of their portfolio firms and ensure that optimal governance systems exist. However, no previous literature has investigated the effect of VC on the pay-performance relationship.

2.2 Hypothesis development

In this section we have developed our main hypotheses that consider the effect of VC on pay-performance relationship in Chinese firms.

We first expect that VC will have a positive effect on the pay-performance relationship of Chinese firm because VCs should have more incentive to monitor their managers. Their monitoring effect in China is even more important because corporate governance and protection for investors is still quite weak. For instance, there are no laws and regulations for protection of external investors and even the existing laws of administering the operation of corporate or securities markets cannot be implemented (Kaoto and Long, 2005). Under this institutional environment, VCs have to monitor managers more frequently to mitigate the expected higher agency costs (Gompers, 1995). Therefore we have constructed the following hypothesis:

H1: VC will have a positive effect on the pay-performance relationship

Second, we expect that the positive effect of VC on pay-performance relationship will be stronger in firms with opportunities for growth and intensive R&D, because they usually had more agency problems and managerial discretions than firms with low growth opportunities and less R&D, and were thus more likely to require closer monitoring (Gomper, 1995). On the other hand, VC-company's high powered compensation schemes examined by Gompers and Lerner (1995) give VC more incentive to closely monitor firms with greater agency problems because their individual compensation was linked to the VC-company's share returns. We therefore have the following two hypotheses:

H2: the positive effect of VC on pay-performance relationship is stronger in firms with high growth opportunities

H3: the positive effect of VC on pay-performance relationship is stronger in firms with high R&D intensities

3. Data and methodology

3.1 Data Collection

As stated in the sections above, VCs in China began to emerge in 2004 and grew rapidly in the capital market after the Small and Medium board (SMEs board) was established, and again in 2005 when the government introduced ‘The Interim Measures for the Administration of Early-Stage Venture Capital Enterprises’. In this paper we collected data from those Chinese firms listed on SMEs board between 2004 and 2009. While only a few firms listed on the main board were involved by VCs who just prefer early stage firms (Gompers, 1995) because the majority firms listed on main board are usually large and mature. Although there were some additional VC-backed firms who has listed on the Growth Enterprises Market (GEM) board since 2009, these firms are not included because they have only one year observation. Therefore, to compare the results of VC-backed and non-VC-backed firms our data only covers firms listed in China’s SME board, because these firms usually have similar characteristics, such as size, growth opportunity, and stage of growth.

All the pay, performance data, and other financial and corporate governance information used in this study were collected from a series of datasets developed by the SinoFin Information Services of the China Centre for Economic Research (CCER) at Beijing University, i.e. the Chinese Listed Firm Annual Report Database (2004-2009) and the Chinese Listed Firm Corporate Governance Database (2004-2009). The stock option data were collected from the China Listed Firm’s Corporate Governance Database (2004-2009) of China Stock Market & Accounting Research (CSMAR) database, and the VC data was calculated by hand by compiling information about the firm’s top ten shareholders from the Chinese Listed Firm Corporate Governance Database (2004-2009). As indicated by previous studies, both the CCER and CSMAR are the most important database on the Chinese capital market (Kato and Long, 2005; Firth et al., 2006, 2007).

Like previous studies, we excluded firms with the following characteristics: 1) Financial firms, 2) “ST” firms, 3) firms whose relevant data were either incomplete or could not be acquired. Finally, our sample consists of 1057 firm-year observations of 357 firms

during 2004 to 2009. Previous studies usually used lagged values of performance when studying the CEO pay-performance relationship because CEO pays respond to a firm's previous performance (e.g. Merhebi et al., 2006; Firth et al., 2007). In order to follow these studies we conducted our regression from the second year after the firm's IPO-year so our final data is from 2005 to 2009, which consists of 700 firm-year observation of 272 firms which went public from 2004 to 2008.

3.2 Measuring Variables

3.2.1 CEO compensation (PAY)

Since 1998 listed firms in China have been required to disclose their managerial compensation in annual report, including the salary and bonus aggregation of the top three executives. We used this information to measure CEO compensation in Chinese firms. We used the variable 'PAY' which equals the log of the total compensation of the top three executives as a proxy for CEO compensation. Stock options are another type of compensation for CEO which have been used by some firms for last few years, we also used a dummy variable 'Option' which equals 1 if a firm's CEO was granted stock options.

3.2.2 Firm performance

Following Hermalin and Wallace (2001), Kato and Kubo (2006), Firth et al. (2006) and Cheng (2008), we also use return on assets (ROA) and return on sales (ROS) to measure accounting based firm performance. We also calculate industry adjusted ROA (ROS), which are the difference between a firm's actual ROA (ROS) and the median ROA (ROS) in the same industry in the same year, and use them to boost to our main results. Finally, we use Tobin's Q, measured as the ratio of market value to firm replacement value as proxy for their market performance.

3.2.3 Measures of VC

Variables that measure VC ownership were also used as another type of main independent variable in the regression. Following Hochberg (2008), we created a dummy variable 'VC', which equal 1 if a firm is VC-backed and zero otherwise. We also used the 'VC ownership (VCO) variable to capture the total amount of VC shares in a VC-backed firm.

3.2.4 Control variables

Firm size (SIZE)

Most previous studies found a strong positive relationship between firm size and CEO compensation (Rosen, 1992; Core et al., 1999; Brunello et al., 2001; Elston and Goldberg, 2003; Firth et al., 2006). Those studies concluded that CEOs are paid more when a company is more successful and when a company is larger. As with previous studies, we used firm size (SIZE), a log of its total assets to measure its size.

Board size (BOARDSIZE)

Corporate governance theory argues that board of directors generally exists to advise and monitor top management, establish executive compensation, and protect the interests of shareholders (Jensen and Murphy, 1990; Hallock, 1997; Barnhart and Rosenstein, 1998; Core et al., 2001). However, previous studies also indicate that their effectiveness is also influenced by its size. For example, Yermack (1996) showed that small boards are more effective than large boards because large boards have less influence over CEOs and complicates decision making (Jensen, 1993). We also used board size (BOARDSIZE) as a control variable.

Board composition (BOARDCOMP)

The effectiveness of a board of directors is also influenced by the proportion of independent directors; more independent directors can protect the interest of shareholders and monitor managerial behaviors much more effectively (Cheng, 2008). Therefore, we used board composition (BOARDCOMP) as another control variable to measure the independence of a board of directors.

Leverage (LEV)

Leverage is always regarded as an important external power to monitor managers (Jensen, 1986; Williamson, 1988). Previous literature also shows that leverage influences CEO compensation and firm performance. We also used leverage, which is the book value of total debts to total assets as a control variable.

CEO duality (DUALITY)

Previous literature also shows that the ability of a board to monitor management was weak when the CEO was the chairman, and the agency cost between managers and shareholders increased (Jensen, 1993; Core et al., 1999). Therefore, empirical studies of CEO compensation usually indicate a positive relationship between CEO compensation and the duality between CEO and chairman (Cyert et al., 2002; Baronyini and Bozzi, 2010). In order

to address this duality on CEO compensation, we also used CEO-chairman duality (DUALITY) as a control variable.

CEO age (CEOAGE)

Age is also regarded as an important individual characteristic for managers because older managers usually have more industrial experience, which is very valuable to a firm. Previous literature shows that age also has a significantly positive relationship with CEO compensation (Brunello et al., 2001). Thus we define the variable CEO age (CEOAGE) as a measure of CEO experience.

Foreign ownership (FOREIGN)

Previous study on the CEO pay-performance relationship in China also shows that firms with foreign investors have stronger pay-performance sensitivities, which indicates that foreign investors have more incentive to monitor managers and encourage firms to pay managers according to their performance (Firth et al., 2006). Therefore, in order to measure the effect of foreign ownership, we created a dummy variable foreign ownership (FOREIGN), which equals 1 if a firm has one or more foreign shareholders, or 0 otherwise.

CEO ownership (CEOSHARE)

CEO ownership is also regarded as an important determinant of compensation in recent literature. For example, Core et al. (1999) indicated that CEO compensation decreased when CEO ownership increased. Therefore, we also included CEO ownership (CEOSHARE) in our regression.

Type of controlling shareholder (STATE)

Many previous studies showed that the CEO pay-performance relationship was affected by the type of controlling shareholder (Kato and Long, 2005; Firth et al., 2006; Barontini and Bozzi, 2010). In China there are two important types, state ownership and private ownership, so we defined a dummy variable (STATE) to measure the type of controlling shareholder where the variable equals 1 if a firm is ultimately controlled by the Central or local governments, or 0 otherwise.

High growth (HIGHG)

As discussed in previous sections, we expected that any positive effect of VC on pay-performance relationship may also be affected by a firm's growth opportunities. Therefore, we defined the variable 'High growth (HIGHG)' to measure the characteristic growth opportunities. The variable HIGHG was defined as a dummy variable which equals 1 if the sales growth was higher than the sample median.

High capital expenditure (HIGHCAPEX)

We also expected that a positive effect of VC on the pay-performance relationship would be stronger in firms with intensive R&D. Since the information on firm's R&D expenditure was not fully disclosed, we used capital expenditure as a proxy for R&D instead. We defined the variable HIGHCAPEX as a dummy variable equal to 1 if capital expenditure to sales was higher than the sample median.

Other control variables

As with other papers, we also included year dummy and industry dummy in our equation to control the effect of time and industries. Since there are only several limited number of firms exist in some industries based on Chinese reported industry classification, following Firth et al. (2006) we classified our sample into five groups, industrial, commercial, public utility, property, and conglomerate (all other industries). A detailed definition of all variables used in this paper can be seen in Table 1.

<Table 1 here>

3.3 Estimation Models

The main models used for estimation in this paper are as follows:

$$\begin{aligned} \text{PAY}_{it} = & \alpha_0 + \alpha_1 \text{PERFORMANCE}_{it-1} + \alpha_2 \text{VC}_{it} * \text{PERFORMANCE}_{it-1} + \alpha_3 \text{SIZE}_{it} \\ & + \alpha_4 \text{BOARDSIZE}_{it} + \alpha_5 \text{BOARDCOMP}_{it} + \alpha_6 \text{LEV}_{it} + \alpha_7 \text{DUALITY}_{it} + \alpha_8 \text{AGE}_{it} \\ & + \alpha_9 \text{FROEIGN}_{it} + \alpha_{10} \text{STATE}_{it} + \alpha_{11} \text{CEOSHARE}_{it} + \text{Year and Industries} + \varepsilon \end{aligned} \quad (1)$$

We used Equation (1) to test the direct effect of VC on the pay-performance relationship. In Equation (1), *i* and *t* represents the firm and year, and ε is the error term related to unobservable features that explain cross sectional variations in CEO pay. PAY is the level of managerial compensation measured by a log of the total top three levels of executive compensation. PERFORMANCE is firm performance, as discussed above, where we proxied firm performance using return on assets (ROA), return on sales (ROS), and Tobin's Q (Q), and then regressed them in separate equations. SIZE is the log of the total firm assets, BOARDSIZE is the log of the total number of directors, BOARDCOMP is the proportion of independent directors, LEV is the ratio of total debts to total assets, DUALITY is a dummy variable that equals 1 if a CEO is also chairman of the board, and 0 otherwise, AGE is the average age of the executives, FOREIGN a dummy variable that equals 1 if a firm has one or

more foreign shareholders, STATE is a dummy variable that equals 1 if a firm is ultimately controlled by state or local governments, CEOSHARE is the proportion of shares held by a CEO. We also included dummy variables to control for industry and year effects. Our baseline equation is Equation (1) without the interactive term of VC and performance.

The aim of Equation (2) was to test the effect of VC on the pay-performance relationship in firms with higher agency costs (higher growth opportunities and higher levels of capital expenditure). In Equation (2), HIGHG (HIGHCAPEX) is a dummy variable that equals 1 if the sales growth (capital expenditure to sales) was higher than the median and 0 otherwise, other variables have the same meaning as equation (1).

$$\begin{aligned} \text{PAY}_{it} = & \alpha_0 + \alpha_1 \text{PERFORMANCE}_{it-1} + \alpha_2 \text{VC}_{it} * \text{HIGHG}(\text{HIGHCAPEX})_{it} * \text{PERFORMANCE}_{it-1} \\ & + \alpha_3 \text{SIZE}_{it} + \alpha_4 \text{BOARDSIZE}_{it} + \alpha_5 \text{BOARDCOMP}_{it} + \alpha_6 \text{LEV}_{it} + \alpha_7 \text{DUALITY}_{it} + \alpha_8 \text{AGE}_{it} + \alpha_9 \text{FROEIGN}_{it} \quad (2) \\ & + \alpha_{10} \text{STATE}_{it} + \alpha_{11} \text{CEOSHARE}_{it} + \text{Year and Industries} + \varepsilon \end{aligned}$$

Equation (3) is a logistic estimation model where the dependent variable OPTION is a dummy variable that equals 1 if a CEO is granted stock options or 0 otherwise. The aim of Equation (3) was to test the effect of VC on stock options. In Equation (3), GROWTH is the percentage of sales growth, CAPEX is the total capital expenditure to total sales, while Q is the market value to book value of total assets. Other variables have the same meaning as equation (1).

$$\begin{aligned} \text{OPTION}_{it} = & \alpha_0 + \alpha_1 \text{VC}_{it-1} + \alpha_2 \text{VC}_{it} * \text{GROWTH}_{it-1} / \text{CAPEX}_{it} / \text{Q}_{it} + \alpha_3 \text{SIZE}_{it} + \\ & \alpha_4 \text{BOARDSIZE}_{it} + \alpha_5 \text{BOARDCOMP}_{it} + \alpha_6 \text{LEV}_{it} + \alpha_7 \text{DUALITY}_{it} + \alpha_8 \text{AGE}_{it} \quad (3) \\ & + \alpha_9 \text{FROEIGN}_{it} + \alpha_{10} \text{STATE}_{it} + \alpha_{11} \text{CEOSHARE}_{it} + \text{Year and Industries} + \varepsilon \end{aligned}$$

3.4 Sample Statistics

Table 2 presents the summary statistics for our sample. In table 2, panel A is the results of the descriptive statistics while panels B, C, and D present the uni-variate tests for VC and non-VC backed firms, VC and non-VC backed firms based on years, VC and non-VC backed firms based on industry. The results in panel A show that the average CEO compensation of the top three executives was 946,900RMB, while VC backed observations account for about 25.29 percent of the total sample. In addition, the average ROA, ROS, and Q for the sample firms are 6.05 percent, 9.65 percent, and 1.61 percent, respectively. In the same period the ROA, ROS, and Q for all of China's listed firms were 2.26 percent, -0.043 percent, and 1.16 percent (Cao et al., 2010). Obviously, firms listed in SMEs board have

higher profitability and market value (growth opportunity) than firms listed in on the main board.

From Panel B we can see that VC-backed firms have a significantly higher CEO compensation, return on assets, return on sales, and Tobin's Q, than non-VC-backed firms. This result suggests that CEO compensation in VC-backed firms is positively associated with performance. In addition, VC-backed firms appear to have larger boards than non-VC-backed firms, perhaps because investor protection in China is still weak, so VCs usually have an incentive to have a voice in the board of directors. Finally, VC-backed firms are more likely to have foreign investors.

The yearly univariate test results in panel C show no significant difference between CEO compensation of VC-backed and non-VC backed firms in the first three years, but CEO compensation of VC-backed firms were significantly higher than non-VC-backed firms over the last two years. The results indicate that although CEO compensation of both VC-backed firms and non-VC-backed firms increased from 2005 to 2009, CEO compensation in VC-backed firms grew faster than in non-VC-backed firms. As a result, CEO compensation in VC-backed firms was significantly higher than non-VC backed firms in recent years.

Panel D shows that CEO compensation varies across industries. For example, for VC-backed firms, CEOs in the property industry had the highest levels of compensation (1,809,257 RMB), and those in public utilities had the lowest (584,666 RMB). The results also showed that VC-backed firms in manufacture and property had significantly higher levels of compensation than non-VC-backed firms.

<Table 2 here>

4. Empirical results

4.1 The effect of VC and performance on CEO compensation

We first conducted our baseline regression to see how VC, performance, and other control variables affected CEO compensation. The results are reported below in Table 3. As shown in Table 3, VC had a statistically significantly positive relationship with CEO compensation which was consistent with our uni-variate test results. This indicates that CEO compensation in VC-backed firms was higher than non-VC-backed firms. In addition, both

the lagged ROA and Q are positively and statistically significantly associated with CEO compensation, which indicates that top executives are paid more in firms with a better accounting performance (higher ROA) or market performance (higher Q). A lagged ROS had no statistically significant relationship with CEO compensation which indicated that ROS are less important in determining CEO compensation.

Turning to the other explanatory variables, we found that most control variables have a statistically significant relationship with CEO compensation. We showed that firm size has a positive and significant relationship with CEO compensation which indicates that larger firms paid their CEOs more than smaller ones. This result is also consistent with most previous studies (Rosen, 1992; Brunello et al., 2001; Girma et al., 2007). Leverage is statistically negatively associated with CEO compensation which indicates that firms with higher leverage paid their CEOs less, which is consistent with Basu et al.'s (2007), who also found that leverage has a statistically negative effect on CEO compensation.

We also found that CEO duality had a positively and significantly positive relationship with CEO compensation which was consistent with (Core et al., 1999; Cyert et al., 2002; Baronyini and Bozzi, 2010). The result indicates that CEO compensation is high when a CEO is also the chairman of the board. Consistent with Brunello et al. (2001), our result shows that age was significantly positively related to CEO compensation, probably because older CEOs have more experience than younger ones. Unlike Core et al. (1999) who found a negative relationship between CEO compensation and CEO ownership we found that CEO ownership had a positive effect on their compensation.

Other results showed that either the size of a board or its composition had no significant effect on CEO compensation, which indicates that board of directors in China cannot effectively monitor their managers. We also found that the ownership structure (both foreign and state ownership) had no significant relationship with CEO compensation. This result differs from most previous studies such as Kato and Long (2005), Firth et al. (2006), and Barontini and Bozzi (2010), which may stem from the fact that our sample was only from the SMEs board rather than main board in the Chinese capital market. And only a small proportion of firms listed in SMEs board have foreign or state ownership.

<Table 3 here>

4.2 The effect of VC on pay-performance relationship

To examine the effect of VC on the pay-performance relationship we estimated a regression using all of Equation (1), which mainly focuses on the interactive terms of VC and performance on CEO compensation. The results are reported in Table 4.

Table 4 shows that the interactive term of VC and lagged ROA, ROS, and Q are all positively and significantly associated with CEO compensation which shows that VC had a positive effect on the pay-performance relationship, which was consistent with our hypothesis H1. For example, the results in the first column of Table 4 indicate that the pay-performance (ROA) sensitivity for VC-backed firms was 4.45 (the sum of 2.67 and 1.77), while the pay-performance (ROA) sensitivity for non-VC-backed firms was just 1.77. Thus, VC increased the pay-performance sensitivity.

In addition, the coefficient for Q_{t-1} was insignificant (p-value is 0.3494), but the interactive term of $ROA * Q_{t-1}$ was significantly positive which shows that Tobin's Q had no significant effect on CEO compensation in non-VC-backed firms but had a significantly positive effect on VC-backed firms. Obviously, VCs have more incentive to pay compensation according to market performance because VC compensation is closely linked to a VC backed company's share returns (Gompers and Lerner, 1995).

<Table 4>

4.3 The effect of VC on pay-performance relationship in firms with high managerial discretion

Table 5 presents the regression results using Equation (2) to examine the effect of VC on pay-performance relationship in firms with higher managerial discretions. As shown in Table 4, the interactive term of $VC * HIGHG * ROA/ROS/Q$ were consistently positive and significant which shows that VC had a statistically positive effect on the pay-performance relationship in high growth firms. This result is consistent with Gompers (1995) who argued that the monitoring role of VCs was more important in high growth firms.

<Table 5 here>

In addition, the regression results of Equation (3) are reported in Table 6. Similarly, the interactive term of $VC * HIGHCAPEX * ROA/ROS/Q$ was also consistently positive and significant, which indicates that VC have a statistically positive effect on pay-performance relationship of firms with high levels of capital expenditure.

These results are consistent with our hypothesis H2 and H3 which means they are also supported by our regression results.

<Table 6 here>

4.4 Robust test

In order to provide some supplementary evidence for our results, we also conducted the following regressions as robust tests. We first regressed equation (1) by using industry adjusted performance as measures of performance, and then we estimates Equation (4) to see the effect of VC on stock options, which are regarded as another type of CEO compensation.

4.4.1 The effect of VC and industry-adjusted performance on CEO compensation

Table 7 presents the results of Equation (1) which show that both VC*ROAAD and VC*ROSAD have a statistically significantly positive relationship with CEO compensation. This is similar to the results in Table 4.

<Table 7>

4.4.2 The effect of VC on stock options

As previously discussed, the monitoring role of VC is more important in firms with high growth opportunities and high levels of capital expenditure to sales. If this role in these firms is important, it is reasonable to expect that VCs in these firms should lead to use more stock options as executive incentives, so we used GROWTH and CAPEX in this section rather than performance as an independent variable, and the stock options dummy as a dependent variable, to conduct a new regression using Equation (4). We also used Tobin's Q as another measure of growth to see the interactive effect of VC and growth (capital expenditure) on stock options. The results are reported in Table 8.

The results in Table 8 show that the coefficients of the interactive term of VC*GROWTH, VC*CAPEX, and VC*Q are consistently positive and the last two interactive terms are statistically significant. This indicates that VC-backed firms with high capital expenditure and Tobin's Q are more likely to use stock options. This was also consistent with our expectations.

<Table 8>

4.5 The effect of VC ownership on pay-performance relationship

We have proved that VCs in China have a positive effect on the pay-performance relationship but we still do not know whether VC ownership has a positive effect on this relationship in VC-backed firms. To determine this, we designed the following model to see the effect of VC ownership on pay-performance within a VC-backed sample. The results are reported in Table 9.

$$\begin{aligned} \text{PAY}_{it} = & \alpha_0 + \alpha_1 \text{PERFORMANCE}_{it-1} + \alpha_2 \text{VCO}_{it} * \text{PERFORMANCE}_{it-1} + \\ & \alpha_3 \text{SIZE}_{it} + \alpha_4 \text{BOARDSIZE}_{it} + \alpha_5 \text{BOARDCOMP}_{it} + \alpha_6 \text{LEV}_{it} + \alpha_7 \text{DUALITY}_{it} + \alpha_8 \text{AGE}_{it} \\ & + \alpha_9 \text{FROEIGN}_{it} + \alpha_{10} \text{STATE}_{it} + \text{CEOSHARE}_{it} + \text{Year and Industries} + \varepsilon \end{aligned} \quad \text{Equation (4)}$$

The results in Table 9 show that the interactive terms of VC ownership and firm performance are positive but they are all insignificant even at 10% level of significance. This indicates that VC ownership has a slightly positive effect on pay-performance relationship within VC-backed firms, which means that the monitoring role of VCs does not decrease significantly with a decrease in VC ownership.

<Table 9>

4.6 The effect of VC and CEO compensation on performance

An effective management compensation and incentive structure means not only paying CEOs according to firm performance, but a higher compensation could lead to a better performance. We also expect that if the monitor and incentive role of VCs works, a higher compensation in the previous year should lead to a better performance next year. We used the following equation to examine this hypothesis. In this equation the independent variable is firm performance which can be ROA, ROS, and Tobin's Q, while the major dependent variables are VC dummy and CEO compensation. The results are reported in Table 10.

$$\begin{aligned} \text{PERFORMANCE}_{it} = & \alpha_0 + \alpha_1 \text{PAY}_{it-1} + \alpha_2 \text{VC}_{it} * \text{PAY}_{it-1} + \alpha_3 \text{SIZE}_{it} + \alpha_4 \text{BOARDSIZE}_{it} \\ & + \alpha_5 \text{BOARDCOMP}_{it} + \alpha_6 \text{LEV}_{it} + \alpha_7 \text{DUALITY}_{it} + \alpha_8 \text{AGE}_{it} + \alpha_9 \text{FROEIGN}_{it} \\ & + \alpha_{10} \text{STATE}_{it} + \text{CEOSHARE}_{it} + \text{Year and Industries} + \varepsilon \end{aligned} \quad (5)$$

From Table 10 we found that CEO compensation had no significant relationship with ROA but there was a statistically significantly negative and positive relationship with ROS and Q. This result indicates that high CEO compensation cannot lead to a better performance which means that the present compensation and incentive structure in China is still inefficient.

However, the results do show that the interactive term VC*PAY had a statistically significantly positive effect on the next year's ROA, ROS, and Q. This result was consistent with our expectations which indicated that the structure of management compensation and incentives are more efficient in VC-backed firms.

<Table 10>

5. Conclusion

This paper examined the effect of VC on the pay-performance relationship using recent panel data of firms listed in the board of SMEs in China's capital market. The results showed that VCs have an important positive effect on pay-performance sensitivity, especially firms with high growth opportunity and high levels of capital expenditure. We also found that VC-backed firms with high growth opportunity and high levels of capital expenditure were more likely to use stock options, but our results also suggest that any monitoring effect by VC was not significantly influenced by VC ownership.

Overall, the evidence suggests that venture capital investors use more effective compensation contract to incentivise top executives in VC-backed firms and such compensation schemes enhance firm performance subsequently.

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Table 1. Detailed definition of variables in this paper

Variables	Definition
<i>Compensation</i>	
Managerial compensation (PAY)	Log of the top three executives' compensation
CEO stock options (OPTION)	Equal to 1 if a CEO has stock options
<i>VC information</i>	
Venture capital as shareholder (VC)	Dummy variable, which equals 1 if a firm's top ten shareholders have VCs.
VC ownership (VCO)	The proportion of shares held by VCs.
<i>Firm performance</i>	
Return on assets (ROA)	Net income / total assets
Return on sales (ROS)	Net income/sales
Tobin's Q (Q)	Market value/replacement value
<i>Firm and CEO characteristics</i>	
Firm size (SIZE)	Log of total assets
Board size (BOARDSIZE)	Total directors on board
Board composition (BOARDCOMP)	Independent directors/total directors
Leverage (LEV)	Total debts/total assets in book value
CEO-chair duality (DUALITY)	Equal to 1 if the CEO is also the chairman of the board
CEO Age (AGE)	Average age of managers and board directors
Foreign ownership (FOREIGN)	Equal to 1 if the firm has foreign investors
CEO ownership (CEOSHARE)	Ownership proportion held by CEO
Firm type (STATE)	Equal to 1 if a firm is controlled by the state or local governments
Growth opportunity (GROWTH)	Percentage change of sales
Capital expenditure (CAPEX)	Total capital expenditure to total sales
High growth dummy (HIGHG)	Equal to 1 if the sales growth is larger than the median
High capital expenditure (HIGHCAPEX)	Equal to 1 if the firm's capital expenditure/sales is greater than the median
<i>Other variables</i>	
Industry (Industry)	Equal to 1 for the specific industry
Year (Year)	Equal to 1 for the specific year

Table 2. Summary Statistics**Panel A. Descriptive statistics**

	Mean	Median	Min	Max	STDEV
Pay (RMB)	946,899	697,250	36,000	11,924,800	872,735
VC	0.2529	0.0000	0.0000	1.0000	0.4350
ROA	0.0605	0.0579	-0.5656	0.3699	0.0602
ROS	0.0965	0.0792	-4.6427	1.0000	0.2209
Q	1.6145	1.3942	0.0927	10.3030	0.9212
SIZE(Million RMB)	1,589	966	218	35,839	2,379
BOARDSIZE	5.7471	6.0000	1.0000	11.0000	1.3082
BOARDCOMP	0.5972	0.5000	0.0000	1.0000	0.1431
LEV	0.4009	0.4069	0.0177	1.2927	0.1835
DUALITY	0.2000	0.0000	0.0000	1.0000	0.4003
AGE	45.59	45.00	36.00	55.00	3.18
FOREIGN	0.0757	0.0000	0.0000	1.0000	0.2647
CEOOSHARE	0.0411	0.0000	0.0000	0.6911	0.0951
STATE	0.2543	0.0000	0.0000	1.0000	0.4358
Options (%)	0.1998	0.0000	0.0000	1.0000	0.4000

Panel B. Univariate Test for VC and non-VC backed firms

	VC	NONVC	Difference	T-test
Pay (RMB)	1,226,480	852,280	374,200	5.05***
ROA	0.0718	0.0567	0.0151	2.96***
ROS	0.1316	0.0847	0.0469	2.47***
Q	1.7487	1.5691	0.1796	2.27***
SIZE(Million RMB)	1,384	1,658	-274	-1.32
BOARDSIZE	5.8701	5.6386	0.2314	1.95**
BOARDCOMP	0.6182	0.6210	-0.0029	-0.11
LEV	0.3843	0.4066	-0.0223	-1.45
DUALITY	0.2429	0.1855	0.0575	1.51
AGE	45.78	45.53	0.25	0.94
FOREIGN	0.1130	0.0631	0.0499	2.18***
CEOSHARE	0.0491	0.0384	0.0107	1.32
STATE	0.2542	0.2543	-0.0001	-0.02

Panel C. Uni-variate test for CEO compensation of VC and Non-VC backed firms based on year

Year	Obs.	VC%	VC		NONVC		Test diff.	
			Mean	Median	Mean	Median	T-test	U-test
2005	39	23.08	615,826	659,000	613,225	479,500	0.02	-0.55
2006	50	22.00	680,945	480,000	646,112	580,000	0.27	-0.04
2007	119	21.85	940,034	705,334	798,322	630,000	1.03	-1.40
2008	220	26.36	1,356,104	1,000,000	847,037	651,500	3.38***	-3.72***
2009	272	26.84	1,383,004	1,090,200	958,207	683,500	3.37***	-3.66***

Panel D. Uni-variate test for CEO compensation of VC and Non-VC backed firms based on industry

	Obs.	VC%	VC		NONVC		Test diff.	
			Mean	Median	Mean	Median	T-test	U-test
manufacture	549	25.86	1,220,300	840,000	778,117	618,000	5.29***	-5.39***
Commercial	62	24.19	1,369,406	1,319,600	1,181,471	790,000	0.83	-1.73
public utility	34	26.47	584,666	391,800	879,216	493,700	-0.97	-0.82

property	22	31.82	1,809,257	1,950,000	1,269,648	1,316,000	1.66*	-1.66*
Conglomerate	33	12.12	1,334,125	1,397,400	1,120,498	840,000	0.42	-0.99

Notes: Definitions of all the variables are reported in Table 1.

The figures for all the value variables are in China's currency, RMB.

The industry classification follows Firth et al. (2006) and classifies firms in our sample into five groups: industrial, commercial, public utility, property, and conglomerate (all other industries).

Table 3. Regression results of pay-performance relationship

Variable	PAY		
C	5.5995 <i>0.0000</i>	4.9359 <i>0.0000</i>	4.8420 <i>0.0000</i>
ROA _{t-1}	2.0691 *** <i>0.0012</i>		
ROS _{t-1}		0.0371 <i>0.2158</i>	
Q _{t-1}			0.0481*** <i>0.0006</i>
VC	0.3225*** <i>0.0000</i>	0.3497 *** <i>0.0000</i>	0.3424*** <i>0.0000</i>
SIZE	0.3558*** <i>0.0000</i>	0.4115*** <i>0.0000</i>	0.4077*** <i>0.0000</i>
BOARDSIZE	-0.0089 <i>0.5936</i>	-0.0151 <i>0.3736</i>	-0.0094 <i>0.5838</i>
BOARDCOMP	-0.0592 <i>0.7320</i>	-0.0743 <i>0.6676</i>	-0.0477 <i>0.7840</i>
LEV	-0.9913*** <i>0.0000</i>	-1.4395*** <i>0.0000</i>	-1.3985*** <i>0.0000</i>
DUALITY	0.1436*** <i>0.0000</i>	0.1270*** <i>0.0004</i>	0.1314*** <i>0.0001</i>
AGE	0.0211*** <i>0.0000</i>	0.0179*** <i>0.0000</i>	0.0188*** <i>0.0000</i>
FOREIGN	-0.0679 <i>0.5219</i>	-0.0676 <i>0.5635</i>	-0.0691 <i>0.5441</i>
STATE	0.0449 <i>0.5016</i>	0.0370 <i>0.5724</i>	0.0352 <i>0.5775</i>
CEOSHARE	0.3800* <i>0.0548</i>	0.5349* <i>0.0562</i>	0.5456** <i>0.0345</i>
Year dummy	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes
Adjusted R-squared	0.2819	0.2637	0.2665
F-statistic	12.9288	11.8822	12.0428

Notes: Dependent variable is CEO compensation. Firm performance is measured by three variables: ROA, ROS, and Q. VC is the proxy for VC-backed firms. SIZE, BOARDSIZE, BOARDCOMP, LEV, DUALITY, AGE, FROEIGN, STATE, and CEOSHARE are defined as in Table 1. The *p-values*, computed using the White (1980) heteroskedasticity robust standard error, are displayed in italics. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 4. The effect of VC on pay-performance relationship

Variable	PAY		
C	5.7079 <i>0.0000</i>	5.1799 <i>0.0000</i>	5.0183 <i>0.0000</i>
ROA _{t-1}	1.7721*** <i>0.0051</i>		
ROS _{t-1}		0.0340 *** <i>0.0880</i>	
Q _{t-1}			0.0139 <i>0.3494</i>
VC* ROA _{t-1}	2.6790*** <i>0.0000</i>		
VC* ROS _{t-1}		1.2080 *** <i>0.0000</i>	
VC* Q _{t-1}			0.1284*** <i>0.0000</i>
SIZE	0.3486*** <i>0.0000</i>	0.3938*** <i>0.0000</i>	0.3997 *** <i>0.0000</i>
BOARDSIZE	0.0018 <i>0.9179</i>	-0.0013 <i>0.9452</i>	-0.0022 <i>0.8984</i>
BOARDCOMP	-0.0287 <i>0.8792</i>	-0.0137 <i>0.9433</i>	0.0014 <i>0.9938</i>
LEV	-0.9415*** <i>0.0000</i>	-1.3211*** <i>0.0000</i>	-1.4124*** <i>0.0000</i>
DUALITY	0.1556*** <i>0.0000</i>	0.1488*** <i>0.0001</i>	0.1358*** <i>0.0001</i>
AGE	0.0208*** <i>0.0000</i>	0.0177*** <i>0.0000</i>	0.0187*** <i>0.0000</i>
FOREIGN	-0.0424 <i>0.6787</i>	-0.0270 <i>0.8182</i>	-0.0423 <i>0.7143</i>
STATE	0.0279 <i>0.6731</i>	0.0114 <i>0.8660</i>	0.0299 <i>0.6316</i>
CEOSHARE	0.3935* <i>0.0609</i>	0.5224* <i>0.0773</i>	0.5920** <i>0.0191</i>
Year dummy	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes
Adjusted R-squared	0.2651	0.2374	0.2480
F-statistic	11.9651	10.4630	11.0253

Notes: Dependent variable is CEO compensation. Firm performance is measured by three variables: ROA, ROS, and Q. VC is the proxy for VC-backed firms. SIZE, BOARDSIZE, BOARDCOMP, LEV, DUALITY, AGE, FROEIGN, STATE, and CEOSHARE are defined as in Table 1. The *p-values*, computed using the White (1980) heteroskedasticity robust standard error, are displayed in italics. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 5. The effect of VC, high growth on pay-performance relationship

Variable	PAY		
C	5.7768 <i>0.0000</i>	5.2139 <i>0.0000</i>	5.0648 <i>0.0000</i>
ROA _{t-1}	1.8731 *** <i>0.0056</i>		
ROS _{t-1}		0.0222 <i>0.3797</i>	
Q _{t-1}			0.0306** <i>0.0348</i>
HIGHG	0.0836*** <i>0.0000</i>	0.1306*** <i>0.0000</i>	0.0924*** <i>0.0000</i>
VC*HIGHG* ROA _{t-1}	1.7199*** <i>0.0007</i>		
VC*HIGHG* ROS _{t-1}		0.8321*** <i>0.0008</i>	
VC*HIGHG* Q _{t-1}			0.1250*** <i>0.0000</i>
SIZE	0.3368*** <i>0.0000</i>	0.3817*** <i>0.0000</i>	0.3855*** <i>0.0000</i>
BOARDSIZE	0.0091 <i>0.6040</i>	0.0062 <i>0.7402</i>	0.0071 <i>0.6886</i>
BOARDCOMP	-0.0131 <i>0.9499</i>	-0.0071 <i>0.9731</i>	0.0053 <i>0.9785</i>
LEV	-1.0061*** <i>0.0000</i>	-1.4139*** <i>0.0000</i>	-1.4232*** <i>0.0000</i>
DUALITY	0.1584*** <i>0.0000</i>	0.1475*** <i>0.0000</i>	0.1429*** <i>0.0000</i>
AGE	0.0231*** <i>0.0000</i>	0.0209*** <i>0.0000</i>	0.0218*** <i>0.0000</i>
FOREIGN	-0.0204 <i>0.8481</i>	-0.0129 <i>0.9143</i>	-0.0215 <i>0.8570</i>
STATE	0.0287 <i>0.6679</i>	0.0135 <i>0.8338</i>	0.0111 <i>0.8625</i>
CEOSHARE	0.4078* <i>0.0617</i>	0.5340* <i>0.0781</i>	0.5801** <i>0.0320</i>
Year dummy	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes
Adjusted R-squared	0.2553	0.2363	0.2477
F-statistic	10.9713	10.0006	10.5734

Notes: Dependent variable is CEO compensation. Firm performance is measured by three variables: ROA, ROS, and Q. VC is the proxy for VC-backed firms. SIZE, BOARDSIZE, BOARDCOMP, LEV, DUALITY, AGE, FROEIGN, STATE, CEOSHARE and HIGHG are defined as in Table 1. The *p-values*, computed using the White (1980) heteroskedasticity robust standard error, are displayed in italics. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 6. The effect of VC, high capital expenditure on pay-performance relationship

Variable	PAY		
C	5.7354 <i>0.0000</i>	5.1512 <i>0.0000</i>	4.9342 <i>0.0000</i>
ROA _{t-1}	2.0879 *** <i>0.0011</i>		
ROS _{t-1}		0.0809*** <i>0.0024</i>	
Q _{t-1}			0.0433*** <i>0.0005</i>
HIGHCAPEX	-0.1521*** <i>0.0004</i>	-0.1399*** <i>0.0002</i>	-0.1554*** <i>0.0003</i>
VC*HIGHCAPEX*ROA _{t-1}	3.3706*** <i>0.0000</i>		
VC* HIGHCAPEX *ROS _{t-1}		1.7603*** <i>0.0000</i>	
VC* HIGHCAPEX *Q _{t-1}			0.1854*** <i>0.0000</i>
SIZE	0.3459*** <i>0.0000</i>	0.3955*** <i>0.0000</i>	0.4011*** <i>0.0000</i>
BOARDSIZE	0.0005 <i>0.9804</i>	-0.0067 <i>0.7476</i>	-0.0015 <i>0.9344</i>
BOARDCOMP	-0.0286 <i>0.8758</i>	-0.0298 <i>0.8679</i>	0.0163 <i>0.9210</i>
LEV	-0.9772*** <i>0.0000</i>	-1.3707*** <i>0.0000</i>	-1.4590*** <i>0.0000</i>
DUALITY	0.1513*** <i>0.0000</i>	0.1391*** <i>0.0004</i>	0.1347*** <i>0.0002</i>
AGE	0.0224*** <i>0.0000</i>	0.0196*** <i>0.0000</i>	0.0201*** <i>0.0000</i>
FOREIGN	-0.0325 <i>0.7771</i>	-0.0238 <i>0.8483</i>	-0.0282 <i>0.8222</i>
STATE	0.0571 <i>0.4378</i>	0.0393 <i>0.6059</i>	0.0500 <i>0.4639</i>
CEOSHARE	0.4410** <i>0.0393</i>	0.5840* <i>0.0558</i>	0.6025** <i>0.0218</i>
Year dummy	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes
Adjusted R-squared	0.2664	0.2430	0.2497
F-statistic	11.5771	10.3481	10.6944

Notes: Dependent variable is CEO compensation. Firm performance is measured by three variables: ROA, ROS, and Q. VC is the proxy for VC-backed firms. SIZE, BOARDSIZE, BOARDCOMP, LEV, DUALITY, AGE, FROEIGN, STATE, CEOSHARE and HIGHCAPEX are defined as in Table 1. The *p-values*, computed using the White (1980) heteroskedasticity robust standard error, are displayed in italics. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 7. The effect of VC on pay-performance relationship (Industry-adjusted performance)

Variable	PAY		
C	5.4367 <i>0.0000</i>	4.5339 <i>0.0000</i>	4.3736 <i>0.0000</i>
ROAAD _{t-1}	2.4965*** <i>0.0000</i>		
ROSAD _{t-1}		0.1002*** <i>0.0010</i>	
QAD _{t-1}			0.0875** <i>0.0123</i>
VC*ROAAD _{t-1}	0.2972* <i>0.0524</i>		
VC*ROSAD _{t-1}		0.3587* <i>0.0884</i>	
VC*QAD _{t-1}			-0.0601 <i>0.4191</i>
SIZE	0.3458*** <i>0.0000</i>	0.4082*** <i>0.0000</i>	0.4109*** <i>0.0000</i>
BOARDSIZE	0.0144 <i>0.4692</i>	0.0100 <i>0.6404</i>	0.0165 <i>0.4281</i>
BOARDCOMP	0.0352 <i>0.8657</i>	0.0360 <i>0.8619</i>	0.0485 <i>0.8161</i>
LEV	-0.8072*** <i>0.0000</i>	-1.2713*** <i>0.0000</i>	-1.2797*** <i>0.0000</i>
DUALITY	0.1548*** <i>0.0000</i>	0.1393*** <i>0.0001</i>	0.1414*** <i>0.0000</i>
AGE	0.0254*** <i>0.0000</i>	0.0222*** <i>0.0000</i>	0.0233*** <i>0.0000</i>
FOREIGN	-0.0059 <i>0.9486</i>	0.0051 <i>0.9603</i>	-0.0059 <i>0.9503</i>
STATE	0.0717 <i>0.2203</i>	0.0581 <i>0.3453</i>	0.0689 <i>0.2139</i>
CEOSHARE	0.4505** <i>0.0117</i>	0.6274** <i>0.0197</i>	0.6617*** <i>0.0026</i>
Year dummy	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes
Adjusted R-squared	0.2426	0.2158	0.2213
F-statistic	12.7819	11.1223	11.4566

Notes: Dependent variable is CEO compensation. ROAAD, ROSAD, QAD are industry-adjusted firm performances. SIZE, BOARDSIZE, BOARDCOMP, LEV, DUALITY, AGE, FROEIGN, STATE, and CEOSHARE are defined as in Table 1. The *p-values*, computed using the White (1980) heteroskedasticity robust standard error, are displayed in italics. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 8. The effect of VC on stock options

	OPTION		
C	-9.5682 <i>0.0052</i>	-8.5455 <i>0.0158</i>	-9.2045 <i>0.0073</i>
GROWTH	-0.0077 <i>0.9122</i>		
CAPEX		-3.2039*** <i>0.0058</i>	
Q			-0.0913 <i>0.4842</i>
VC	0.8936*** <i>0.0004</i>	0.5231* <i>0.0917</i>	0.3204 <i>0.4474</i>
VC*GROWTH	0.5510 <i>0.3042</i>		
VC*CAPEX		3.5383** <i>0.0187</i>	
VC*Q			0.4041* <i>0.0563</i>
SIZE	0.6489*** <i>0.0000</i>	0.6363*** <i>0.0001</i>	0.6409*** <i>0.0001</i>
BOARDSIZE	0.0216 <i>0.8213</i>	0.0142 <i>0.8829</i>	0.0263 <i>0.7856</i>
BOARDCOMP	0.6333 <i>0.4231</i>	0.6786 <i>0.3973</i>	0.7566 <i>0.3435</i>
LEV	-3.3298*** <i>0.0000</i>	-3.3604*** <i>0.0000</i>	-3.2592*** <i>0.0000</i>
DUALITY	0.3778 <i>0.1371</i>	0.3127 <i>0.2199</i>	0.3682 <i>0.1479</i>
AGE	-0.0990*** <i>0.0041</i>	-0.1059*** <i>0.0022</i>	-0.1023*** <i>0.0031</i>
FOREIGN	-0.1655 <i>0.6523</i>	-0.1475 <i>0.6897</i>	-0.1344 <i>0.7155</i>
STATE	-0.5727** <i>0.0411</i>	-0.5164* <i>0.0658</i>	-0.6043** <i>0.0326</i>
CEOSHARE	-1.1466 <i>0.2807</i>	-1.0312 <i>0.3358</i>	-1.0908 <i>0.3053</i>
Year dummy	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes
Pseudo R2	0.1970	0.2150	0.2030

Notes: Dependent variable is OPTION dummy. VC is the proxy for VC-backed firms. SIZE, BOARDSIZE, BOARDCOMP, LEV, DUALITY, AGE, FROEIGN, STATE, CEOSHARE, GROWTH, CAPEX and Q are defined as in Table 1. The *p-values*, computed using the White (1980) heteroskedasticity robust standard error, are displayed in italics. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 9. The effect of VC ownership on pay-performance relationship (VC sample)

Variable	PAY		
C	2.9063 0.0084	1.8627 0.0035	2.6249 0.0059
ROA _{t-1}	-0.0956 <i>0.9373</i>		
ROS _{t-1}		1.3977*** <i>0.0000</i>	
Q _{t-1}			0.0932*** <i>0.0001</i>
VCO*ROA _{t-1}	6.6377 <i>0.4608</i>		
VCO*ROS _{t-1}		0.7023 <i>0.8840</i>	
VCO*Q _{t-1}			0.1645 <i>0.5207</i>
SIZE	0.5601*** <i>0.0000</i>	0.6563*** <i>0.0000</i>	0.5936*** <i>0.0000</i>
BOARDSIZE	0.0310 <i>0.4115</i>	0.0211 <i>0.5948</i>	0.0269 <i>0.4998</i>
BOARDCOMP	0.5969*** <i>0.0000</i>	0.4657*** <i>0.0000</i>	0.5353*** <i>0.0003</i>
LEV	-1.6179*** <i>0.0000</i>	-2.4188*** <i>0.0000</i>	-1.8307*** <i>0.0000</i>
DUALITY	0.0997*** <i>0.0877</i>	0.0424 <i>0.5244</i>	0.0948 <i>0.1851</i>
AGE	-0.0119 <i>0.2129</i>	-0.0182* <i>0.0684</i>	-0.0151* <i>0.0905</i>
FOREIGN	-0.1863 <i>0.1391</i>	-0.1544 <i>0.1849</i>	-0.1767* <i>0.0943</i>
STATE	0.2544*** <i>0.0018</i>	0.3199*** <i>0.0016</i>	0.2772*** <i>0.0012</i>
CEOSHARE	0.3438* <i>0.0743</i>	0.6834*** <i>0.0009</i>	0.3190*** <i>0.0001</i>
Year dummy	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes
Adjusted R-squared	0.3500	0.3677	0.3572
F-statistic	5.4874	5.8458	5.6306

Notes: Dependent variable is CEO compensation. ROA, ROS, Q are industry-adjusted firm performances. VCO is the proportion of shares held by VCs. SIZE, BOARDSIZE, BOARDCOMP, LEV, DUALITY, AGE, FROEIGN, STATE, and CEOSHARE are defined as in Table 1. The *p-values*, computed using the White (1980) heteroskedasticity robust standard error, are displayed in italics. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 10. The effect of VC and CEO compensation on performance

Variable	ROA	ROS	Q
C	-0.3558 <i>0.0000</i>	-0.8586 <i>0.1048</i>	4.4065 <i>0.0003</i>
PAY _{t-1}	0.0050 <i>0.2740</i>	-0.0066*** <i>0.0057</i>	0.1580*** <i>0.0000</i>
VC*PAY _{t-1}	0.0009** <i>0.0302</i>	0.0032*** <i>0.0000</i>	0.0149*** <i>0.0018</i>
SIZE	0.0260*** <i>0.0000</i>	0.0766*** <i>0.0009</i>	-0.1169 <i>0.1873</i>
BOARDSIZE	-0.0031** <i>0.0186</i>	-0.0011 <i>0.8607</i>	-0.1023** <i>0.0447</i>
BOARDCOMP	-0.0081** <i>0.0172</i>	-0.0294 <i>0.1756</i>	-0.3670 <i>0.2233</i>
LEV	-0.2221*** <i>0.0000</i>	-0.6949*** <i>0.0000</i>	-1.6006*** <i>0.0000</i>
DUALITY	-0.0093* <i>0.0815</i>	-0.0155 <i>0.1823</i>	-0.2135** <i>0.0164</i>
AGE	-0.0017*** <i>0.0072</i>	-0.0043* <i>0.0991</i>	-0.0217*** <i>0.0000</i>
FOREIGN	0.0003 <i>0.9540</i>	-0.0176*** <i>0.0036</i>	0.1164 <i>0.1240</i>
STATE	-0.0044** <i>0.0230</i>	-0.0093 <i>0.7754</i>	0.1081* <i>0.0749</i>
CEOSHARE	0.0779*** <i>0.0008</i>	0.1638** <i>0.0184</i>	-0.0180 <i>0.9616</i>
Year dummy	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes
Adjusted R-squared	0.3688	0.2294	0.2710
F-statistic	18.7536	10.0464	12.3000

Notes: Dependent variable is ROA, ROS and Q. PAY is CEO compensation. VC is the proxy for VC-backed firms. SIZE, BOARDSIZE, BOARDCOMP, LEV, DUALITY, AGE, FROEIGN, STATE, and CEOSHARE are defined as in Table 1. The *p-values*, computed using the White (1980) heteroskedasticity robust standard error, are displayed in italics. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.