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### **Venture capital experience and portfolio firms' long-run performance in China**

By Qiong Ji, Xiaoming Ding, and Victor Murinde



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# Venture capital experience and portfolio firms' long-run performance in China<sup>‡</sup>

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## ABSTRACT

We study how venture capital (VC) experience, as measured by age, industry of specialization, historical investments, as well as success rate, influences post-IPO performance of portfolio firms in China. We uncover new results which show that VC experience enhances portfolio firm performance through better corporate governance and monitoring. We find that VC-backed firms exhibit better governance outcomes and board processes of their portfolio firms. Moreover, these VC-backed firms have significantly higher probability of not only allocating ownership to senior executives than non-VC-backed firms but also aligning the interests of the executives and the shareholders. Identification concerns are addressed by using instrumental variables. Overall, our study provides investors, VC managers and financial analysts an in-depth understanding of the value added by VC experience, derived from VC monitoring and involvement in the governance of the portfolio firms post-listing.

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*Keywords:* Venture Capital experience; Post-IPO performance; Corporate governance

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## 1. Introduction

Venture capital (hereafter, VC) is an important source of financing for entrepreneurial companies (Gompers and Lerner, 2001). In addition, VCs complement their financial resources to these entrepreneurial firms with a series of value-added services, including but not limited to, marketing, strategic advisory and managerial support vital for the growth of these firms.<sup>1</sup> Faced with a wide range of tasks, VCs find ways to reduce nonsystematic risk associated with investing in new opportunities by reducing the cost of information asymmetry (Amit et al., 1998). It is here that the VC experience can be particularly important. For example, at the selection stage, the experience in due-diligence, contractual terms and assessment of management team of start-up firms are valuable for the long-term financial interest on the VC firm. In addition, during the monitoring stage, VC's network and experience of sitting on the board is equally important for both the portfolio firm and the VC firm itself. Hence, given the huge challenges and benefits of VCs, an important question that remains unanswered is the effect of VC experience on the post-IPO performance as a result of corporate governance and monitoring of their portfolio firms. In this study, we try to address this gap in the literature.

Sorensen (2007) conducted the first systematic analysis that detangles the effects of VC experience based on firm-level data. Using a two-sided matching model to address the endogeneity issues, the author confirms that in the US, experienced VCs add more value to companies. This happens because experienced VCs are able to select better companies and to provide more valuable services. Although Sorensen (2007) mentions the ability of experienced VCs, the study does not focus on portfolio firms' post-IPO performance. Moreover, it does not scrutinize the mechanism through which VCs contribute to the corporate governance of their portfolio firms'. As a result, several important issues regarding the role of VC experience on their portfolio firm's performance and governance remain unaddressed.

To answer these issues, this study attempts to extend the findings of Sorensen (2007) by examining the contribution of VC experience on a portfolio firm's post-IPO performance and corporate governance in China over an eighteen year period from 1996 to 2014. China, including Hong Kong, has been the second largest VC market in the world.<sup>2</sup> However, neither its legal nor financial system is well developed, and personal relationships (popularly known as *Guanxi* in Chinese) have a major impact on the industry (Bruton and Ahlstrom, 2003; Ahlstrom et al., 2007). This establishes China as an interesting research setting. Besides, almost

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<sup>1</sup> See Da Rin et al. (2013) for the detailed discussion on services and assistance offered by VC firms.

<sup>2</sup> Refer to 2016 Annual Observation of China's Science and Technology Financial Ecology.



all previous studies on VC experience are based on data from developed economies. There has been little research on the effectiveness of VC experience in adding value to portfolio firms in developing countries and transition economies like China, where the institutional setup is complicated and different from that of developed industrialized countries (Allen et al., 2005). A recent study closest to ours is Guo and Jiang (2013), which finds that in the Chinese setting, VC-backed firms outperform non-VC-backed firms in terms of profitability, labor productivity, sales growth, and R&D investments post-listing. However, the study is silent on the direct effect of the VC experience on portfolio firm performance and governance. Also, Krishnan et al. (2011) study the positive effect of VC age (a popular proxy for VC experience) on invested firm's governance level in the US, but they do not address the role of governance and monitoring of portfolio firms.

In this study, we first examine the effect of VC investment on their portfolio firm's profitability, market recognition, and growth potential compared to their non-VC-backed counterparts. Assuming VC-backed firms outperform non-VC-backed firms, we investigate how VC experience contributes to this superior performance of their portfolio firms. We then explore how VC involvement, both in terms of experience and the level of investment, contributes to the governance outcome of the portfolio firms.

In line with Guo and Jiang (2013), our results indicate that VC-backed firms outperform non-VC-backed firms in several aspects, including profitability, market recognition, and growth opportunities. Moreover, similar to the findings of Sorensen (2007), we find that our lead VC experience measures consistently have significant and positive effect on all the four post-IPO long-run performance measures, even after an instrumental variable is employed to control for VC selectivity. The results indicate that VC experience can be acquired overtime, and then implemented to generate superior performance. To investigate how VC experience contributes towards the portfolio firm's advisory and monitoring service, we examine whether VC investment is associated with stronger corporate governance in the post-IPO period. The results show that VC-backed firms have significantly higher probability of allocating stockholding to senior executives and the incentive pay for CEOs than the non-VC-backed firms. This approach is able to better align the interests of the executives and the shareholders, and limit managerial expropriation. Also, VC-backed firms are associated with more independent directors and less duality problems. In addition, the ownership concentration problem is lower for the VC-backed IPO firms. In summary, the VC-backed firms exhibit better governance mechanisms. Sample selection issues, and all the identification concerns are addressed by using instrumental variables.

This study contributes to the VC literature in three key aspects. First, to the best of our knowledge, this is the first systematic estimation of the contribution of VC experience on firm performance and the corporate governance outcome of entrepreneurial firms in emerging markets, where the financial and legal systems are distinctly different from those in Western countries (Allen et al., 2005). Hence, we contribute to the literature on corporate finance and corporate governance in emerging markets by examining the impact of active participation of financial institutions in the decision-making process of entrepreneurial firms. Second, following Sorensen (2007), we extend the existing literature (*e.g.*: Chemmanur et al., 2011; Guo and Jiang, 2013; Krishnan et al., 2011; Sorensen, 2007; *etc*) by further exploring the approach of how VCs contribute to the post-IPO performance and governance of portfolio firms, with the focus on board independence, mutually aligned interests of the shareholders and senior executives, and mitigating expropriation through ownership concentration. Lastly, we propose a new VC experience measure, which is a robust supplement to the current literature.

This study contributes to the practice of VC industry, and it adds some pieces to the puzzle by deepening our understanding of the benefits and performance of VCs in China. Our work supports the importance of VC involvement in the form of holding shares in portfolio firms after IPO. We find that the bulk of the value that VC's add is the result of their monitoring and involvement in corporate governance. The results suggest that entrepreneurs should consider VC a valuable partner that can improve firms' chances of success, rather than a popular belief among entrepreneurs considering VCs to be merely "vulture capitalists" who only offer expensive financing and little else (Rosenstein et al., 1993). Furthermore, our findings suggest that the authorities should work towards improving the regulatory setup for the VCs to enhance the market efficiency, as such investments tend to pursue not only financial return but also significant social payoffs and localized public benefits (*e.g.*: job creation or economic growth in a specific region or sector).

The remainder of this paper is organized as follows. Section 2 is the theoretical background and hypothesis development, Section 3 describes the data, variables and methods we employed in this study. Section 4 and 5 presents the empirical results on the influence of VC experience on portfolio firms' post-IPO performance and governance outcome. Section 5 concludes with the key results as well as the implications and limitation of this research.

## 2. Theory and hypothesis development

The existing literature discusses, in great detail, the antecedents of VC investment and the subsequent outcomes of such investment (see, Da Rin et al., 2013 for detailed survey literature on VC investment). VCs enhance the value of entrepreneurial firms by screening high-potential firms (Brander et al., 2002), as well as monitoring their investments and providing value-added services, such as financial and managerial resources, marketing and consulting services, and access to the VC's social capital (Chemmanur et al., 2011). Moreover, the monitoring of the portfolio firms by the VCs help these young firms in utilizing their resources more efficiently (Gompers, 1995). Therefore, most studies suggest a positive relationship between VC investment and IPO performance (Megginson and Weiss, 1991; Brav and Gompers, 1997; Lerner, 1995; Wang et al., 2003; Chemmanur et al., 2011; Guo and Jiang, 2013; Krishnan et al., 2011).

Given the wide range of tasks and challenges, VC experience can be of particular importance. Sorensen (2007), in the first study to investigate VC experience, suggests that experienced VCs can select high potential entrepreneurial firms and provide more valuable services, *i.e.* experience can be a valuable asset for VCs. Nahata (2008) shows that experienced VCs normally find it easier to raise funds. Berger and Schaeck (2011) confirms that experience in due diligence, advisory services, monitoring, as well as well-planned exit strategies are particularly important for the VCs to attract small and medium sized enterprises into their investment portfolio. Lee and Wahal (2004) prove that the problem of asymmetric information is severe in young rather than mature VC firms, *i.e.* VCs will be better in reducing the cost of information asymmetry as they grow older and accumulate more experience.

However, another group of scholars question the VCs ability to enhance portfolio firm performance. The valuable finance and value-added services enable the experienced VCs to require a relatively higher premium from entrepreneurs (Hsu, 2004). For example, experienced VCs are normally familiar with their industry of specialization, giving them a comprehensive understanding of the entire industry chain. This enables them to maximize their profit, resulting in lower returns for entrepreneurial firms. Furthermore, the uncertainty can lead to a substantial transaction cost, which VCs might transfer to their funded firms' post investment to improve their own returns. Moreover, conflicts of interests might force VCs to pressure entrepreneurs to pursue strategies that benefit VCs' interest but are not necessarily beneficial for the portfolio firms. For example, younger VCs might take their portfolio firms to IPOs prematurely in order to realise the significant exit values, commonly known as 'grandstanding' (Gompers, 1995;

Lee and Wahal, 2004; Wang et al., 2003). Such disadvantages of VC investments may partially offset their benefits in specific circumstances, leading to lower performance effects of the investment. Thus, we will investigate if the value added due to the VC experience exceeds the incurred costs for the VC-backed portfolio firms. This leads us to the following hypothesis:

**H1:** VC experience has positive effect on post-IPO performance, even after controlling for VC selectivity.

In contrast to other institutional shareholders such as mutual funds or pension funds, VCs often have much closer relationship with their portfolio firms since they are one of the initial investors in the company. Generally, to safeguard their investment and to be actively involved in the decision making process, VCs demand an active board representation in their portfolio firm (Lerner, 1995). Due to the longer-term horizon of their investments and high information asymmetry, shareholder activism of VCs is high (van den Berghe and Levrau, 2002). Therefore, VCs' monitoring incentive provides an opportunity to decrease the probability of moral hazard in the absence of incentive compensation (Jensen and Meckling, 1976). Additionally, VCs have the expertise to control managerial actions (Gompers, 1995). In consequence, VCs' monitoring should positively influence the funded firms' development.

VCs normally hold shares and take board seats in the portfolio firms after IPO (Megginson and Weiss, 1991). Studies prove that large shareholders can monitor firms' management team effectively and improve firm performance significantly (Burkart et al., 1997; LaPorta et al., 1999). Few existing studies try to link the monitoring function of VCs and the outperformance of VC-backed firms. Among the few studies that consider the corporate governance of VC-backed firms, Krishnan et al. (2011) provide evidence on positive relationships among VC investment, corporate governance, and VC-backed firm performance based on the US data. Bonini et al. (2012) suggests that VCs' influence on executive compensation, board decisions, and board appointments increases significantly as their funding increases. We also link VC investment and corporate governance of portfolio firms to further explore the factors that explain the post-IPO performance of VC-backed firms in China.

Board independence has been regarded as an essential element of "good" corporate governance. In general, lawmakers and stock exchanges regard adopting legislation and codes, recommending higher representation of outsiders on the board of publicly traded companies around the world as a sign of effective governance (Liu et al., 2015). Jensen (1993) argues that Chairman-CEO duality gives the CEO excessive power over the decision-making process, and

separation of CEO and chairman roles strengthens board independence and increases board oversight of senior management. Therefore, this study examines if the outperformance of VC-backed firms is attributed to higher board independence. This gives us the following hypothesis:

**H2a:** VC-backed firms have higher board independence than non-VC-backed firms.

The conflict of interest between executives and shareholders is a classic issue that results in principal-agent problem. A compensation plan that aligns the interests of the two parties may give senior executives the much-needed incentive to maximize shareholder return and improve performance (Murphy, 2008). Meanwhile, Jensen and Meckling (1976) suggest the cost of deviating from value-maximization for the stockholders declines as management's stock ownership rises. When senior executives' stakes rise, they bear a larger proportion of such costs and are less likely to squander corporate wealth. Therefore, in this study we will also investigate if the outperformance of VC-backed firms is a result of better compensation plan and higher management ownership. This gives us next sub-hypothesis:

**H2b:** Senior executives in VC-backed firms have higher stock ownership and compensation.

Finally, in their seminal study on the detrimental effects of ownership concentration in economies with poor shareholder rights and weak legal system, La Porta et al. (1999) suggests that concentrated ownership leads to serious agency problems between controlling and minority shareholders in countries with poor shareholder rights. In a weak legal environment, like China; risk of expropriation for the minority shareholders is relatively high (Allen et al., 2005). This clearly indicates that higher ownership concentration is not a "good" phenomenon for corporate governance. Therefore, we also investigate if VC-backed firms experience lower ownership concentration problem. This leads us to the following sub-hypothesis:

**H2c:** VC-backed firms' ownership structure is less concentrated.

### 3. Sample selection and variable description

#### 3.1. Data and sample construction

The firm-level data used in our study is primarily obtained from the China Stock Market and Accounting Research (CSMAR) database. This database provides the detailed information of all the Chinese IPOs in terms of their age, location, number of employees, ownership structure for all the listed years along with major financial and accounting parameters.

Next, we draw our original sample of VC-backed firms from CVSource<sup>3</sup> database over the eighteen-year sample period, commencing from 1996 to 2014.<sup>4</sup> Prior to 1996, private funds including individuals and corporations were prohibited from investing in VC firms in China. In line with extant literature, we exclude buyouts and private equity investments from our sample (Krishnan et al., 2011; Guo and Jiang, 2013; Wang et al., 2003). For each VC-backed firm obtained from CVSource, we secure the following details of the firm – name, location, industry (in four digits SIC Code) of the firm, the total amount of VC investment gained by the firm, the number of VCs involved in each deal, and the number of venture financing rounds for each firm. For each VC, the dataset also provides information on its age, location, and the amount of funds under management, among others.

Initially, based on the data available from CVSource, we have 8,280 firms that receives their investment from VC firms before listing during our sample period. However, we had to manually match successful project exits through IPO from CVSource with the IPO firm list in CSMAR one at a time as most of the names in CVSource are abbreviations without any consistent pattern. Next, we manually identify if there are VC investors among the top ten shareholders. Specifically, we look if there is ‘VC’, ‘VC fund’ or ‘VC capital’ *etc.* among the top ten shareholder names of the IPO firm, and if so, then what is the proportional shareholding assigned as VC ownership in the IPO firm. For other suspected institutional shareholders, we identify them one by one from the China Venture Capital Yearbook, firm’s website, as well as CVSource database. Besides, we double-check the dataset by lists of VCs in CVSource database for any possible omission of IPO firm. Since in this study we focus on the effect of the VC backing on the long-run performance of the newly listed firm, we drop VC-backed firms for which we are unable to find firm-level listing time financial data and also at least 3-

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<sup>3</sup> CVSource is an online database which provide information services to players active in the Chinese VC & PE market.

<sup>4</sup> We finish our IPO sample in 2014 to have adequate firm-level data for at least 3-years of post-IPO performance for hypothesis testing.

years of consistent post-listing data from CSMAR. This leaves us with a final sample of 567 VC-backed firms which successfully went public in our 18- year sample period.

To compare VC-backed and non-VC-backed firms in terms of their post-listing long-run performance, we construct a control group for comparison purposes. We build the control group in several steps to ensure that our results are not driven by a specific matching technique. We start by selecting all the non-VC-backed firms for which we have sufficient available data from CSMAR. We then match the VC-backed firms with non-VC-backed firms by industry (at the four-digit SIC Code), IPO year and firm size using Propensity Score Matching (PSM) methodology to build the control group. Following Guo and Jiang (2013) we randomly draw one-to-five matched pairs to build the control group. To ensure that our control group is representative, we repeat this random draw methodology ten times. These steps ultimately give us 1,696 non-VC-backed Chinese IPO firms for 567 VC-backed IPO firms. This brings our final sample total to 2,263 firms.

In Table 1, we report the distribution of the sampled IPO firms, along with the split between the VC-backed and non-VC-backed firms using the China Securities Regulatory Commission (CSRC) industrial classification. As shown in the table, both the maximum number of IPO-firms, and VC-backed firms are concentrated in manufacturing sector. This is not surprising owing to the fact that China is primarily an industrial country. Followed by the manufacturing sector, next is the information technology, finance and insurance, and real-estate development sectors. In total, these four sectors represent almost 90% of the total VC-backed firms in China during our sample period.

**[Please insert Table 1 about here]**

### 3.2. *Variable description*

To test the validity of underlying thesis of this study, correct estimation of the long-run performance of a newly listed firm is of first-order importance in this study. Therefore, in order to avoid the possibility of the results being driven by a specific proxy of long-run performance, we estimate IPO performance across four different dimensions, including *i)* industry-adjusted rate of return on assets (ROA) to capture profitability, *ii)* Tobin's Q to capture investment opportunities available to the firm, *iii)* annual stock return to account for the performance of the firm in the equity market, and *iv)* growth of sales to capture firm growth. All the performance proxies are from the IPO year to the end of 2016, or up to the year of delisting.

In this study, we are interested in the differences of long-run performance between VC-backed and non-VC-backed firms post listing. Hence, we need a variable to distinguish whether the firm is backed by the VC firm or not. The *VC\_BACK* is a dummy variable equal to 1 if the firm is backed by VC(s), and 0 if otherwise. A significantly positive coefficient on this variable implies that post-listing, VC-backed firms have a better performance.

Furthermore, we are also interested in how VC experience contributes to post-IPO performance. Our first experience measure is based on VC's maturity, which is measured by VC's age (*VC\_AGE*). The second proxy for VC experience is VC specialization (*VC\_SPEC*), which is recognised if VC's industry of specialization is similar to the IPO firms' main industry of operation. It is a dummy variable which equals to 1 if VC's specialization industry matches with the IPO firms, and 0 otherwise. Our third proxy for VC experience is VC's historical average investment (*AVG\_VC\_INVEST*) per firm prior to investing in the current firm. Lastly, the most popular exit mechanisms for VC including IPOs, M&A, and management buyout while IPOs are regarded as the most profitable and success one. As in our dataset more than 95% success projects are exit through IPOs & M&A, we use the number of IPOs taking by the underlying VC divided by the total number of projects that VC exit through IPO and M&A (*VC\_IPO\_RATIO*) as our last experience measure.

Given our emphasis on the monitoring role of VCs in the post-IPO period, for IPO issuers with more than one VC investor, we focus on the lead VC's experience measures. Following Nahata (2008), we define a 'lead' VC as the one making the largest amount of investment. While syndicate size is typically a signal of firm quality (Bertoni and Groh, 2014), previous studies show that compared to other syndicated members, lead VCs have high tendency to hold shares or take board seats to be intensively involved in the governance of portfolio companies after the IPO for a certain period and participate in the operating of the firm actively (Hopp and Lukas, 2014). Therefore, focusing on lead VCs enables us to capture the greater guidance and support that these syndicated VCs provide to entrepreneurial firms. When there are multiple leads, we use the geometric average in investment for experience measures. When there is only one VC in the IPO firm, it is treated as the lead VC.

We control for the effects of IPO firm characteristics following prior literature (Guo and Jiang, 2013; Krishnan et al., 2011; Wang et al., 2003) on the IPO firms' long-run performance to ensure that VC experience is not a proxy for observable sample heterogeneity. We control for the following characteristics of IPO firms. *IPO\_AGE* represents IPO firms' age from year of listing to the current year of observation. *SIZE* stands for IPO firm's size measured by total assets in logarithm. *LEVERAGE* represents IPO firms leverage ratio, which is the ratio



of total liability and total assets. In addition, MNGT\_SHARE represents the proportion of the senior management shareholding in the firm. Lastly, the effect of the state ownership in the IPO firm represented by SOE is assigned to 1 if the state has more than 50% stake in the firm, and 0 otherwise. Year and industry fixed effects are used across all the regression models to control for economic conditions and industry differences, respectively. To avoid extreme outliers driving our results, we winsorize all the financial and accounting ratios at upper and lower 1% level.<sup>5</sup> Appendix A1 provides the detailed definition of all the variables used in this study.

### 3.3. Descriptive statistics

Panel A of Table 2 provides the summary statistics of the full sample. Panel B and C present the summary statistics of firm characteristics for both VC-backed and non-VC-backed firms during our sample period, respectively. We find that VC-backed firms in our sample; on average outperform non-VC-backed firms across all the four long-run performance measures. For instance, VC-backed firms' mean value of ROA (4.6%), Tobin's Q (2.544), annual stock return (40.4%), and growth of sales (20.5%) are significantly higher than that of non-VC-backed firms (3.4%, 1.841, 30.3%, and 15.3% respectively), post-listing which is consistent with previous studies (Brav and Gompers, 1997).

**[Please insert Table 2 about here]**

In other aspects, the two groups show significantly different characteristics. For example, the mean value of IPO age for non-VC-backed firms is 9.83 years while it is only 4.28 years for VC-backed firms, indicating that VC-backed firms go public quicker. Interestingly, VC firms avoid investing in SOEs in China. Furthermore, in general VC-backed firms are smaller in size with lower debt level compared to their peers. These firms also exhibit superior corporate governance mechanism than non-VC-backed firms with more independent directors, and lower level of CEO duality problem and ownership concentration.

Additionally, when it comes to VC-level experience characteristics, we observe that VC industry in China is relatively young; both in terms of VC firm age (average VC firm age is 12.15 years) and investment (average prior investment is only US\$ 5.88 million). Besides,

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<sup>5</sup> We also test the robustness of our hypothesis with financial ratios winsorized at the 5% and 95% levels. The results remain unchanged. The results are obtainable from the authors on request.

52% of the VC firms generally prefer to invest in the sector where they specialize, and also hold almost 30.9% shareholding in the portfolio firm post-listing.

#### 4. Empirical results

##### 4.1. Does VC-backed firms outperform non-VC-Backed firms?

An immense body of empirical research has scrutinized the relationship between VCs and portfolio firm performance, especially in recent years (Brav and Gompers, 1997; Krishnan et al., 2011; Guo and Jiang, 2013). However, empirical findings on performance implications of VC investments, for the portfolio firms, are non-conclusive. While some researchers find positive effects of VC financing (e.g., Brav and Gompers, 1997; Gou and Jiang, 2013), other research suggests non-significant or negative performance for the financed firms (e.g., Busenitz et al., 2004; Jain et al., 2008). Therefore, before establishing the relationship between VC experience and IPO firm performance backed by the VC, we will start by investigating whether VC-backed firms outperform non-VC-backed firms in our sample. Hence, random effect panel regression model<sup>6</sup> is used to test the effect of VC investment on the long-run performance of the newly listed IPO firms:

$$Performance = \alpha + \beta_{year} + \beta_{ind} + \beta_1 VC\_BACK + \beta_2 IPO\_AGE + \beta_3 SOE + \beta_4 SIZE + \beta_5 LEVERAGE + \beta_6 MNGT\_SHARE + \epsilon \quad (1)$$

where performance represents one of the four performance measures: ROA, Tobin's Q, annual stock return or growth of sales;  $\beta_{year}$  and  $\beta_{ind}$  are vectors of year fixed effects to control for economic conditions, and industry fixed effects to control for industry differences, respectively. In *EQ. 1* above, we are primarily interested in the co-efficient and level of significance on  $\beta_1$  as it directly captures the effect VC investment has on the performance of the firm. We also control for an array of firm-level factors that can directly affect the performance of the IPO firm.<sup>7</sup>

Table 3 shows the regressions that compare the ROA, Tobin's Q, annual stock return and sales growth of VC-backed and non-VC-backed firms. As shown in Table 3, VC dummy is significantly positive for all performance measures, implying that VC-backed firms

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<sup>6</sup> In order to capture the co-efficient value and the level of significance on firm-specific time-invariant dummy variable (VC\_BACK), we use random-effect panel regression model.

<sup>7</sup> The mean variance inflation factor (VIF) is 1.48 across all the models, which is much less than 10. This indicates that the problem of multicollinearity is not an issue in our analysis.

outperform their non-VC-backed counterparts in terms of profitability and growth opportunities. Model 1 shows that the ROA of VC-backed firms is higher than that of non-VC-backed firms with a significant co-efficient value of 0.001 (T-stat. = 1.84), which is *circa* 2.8% of the average ROA value. Models (2) and (4) reports the firm-level Tobin's Q and growth of sales. The results are similar to those we report for profitability. VC-backed firms generally have higher growth potential than non-VC-backed firms. On average, in economic terms, the Tobin's Q and growth of sales of VC-backed firms are higher than that of non-VC-backed firms by approximately 1.9% and 28.1%, respectively. Next, as per model (3), on average, VC-backed firm-level annual stock return is *circa* 4.6% more than the non-VC-backed firms.

Meanwhile, the control variables incorporated in this model are theoretically consistent. IPO\_AGE is negative and significant across all the four performance measures, implying a firm's profitability decreases over time after IPO. It is interesting that firm size has a positive and significant impact on ROA, annual stock return and growth of sales, but negative with Tobin's Q, suggesting that larger firm's exhibit superior profitability than smaller firms, but when it comes to growth opportunities, investors tend to discount the value of large firms. Expectedly, leverage ratio has a negative and significant impact on ROA and annual stock return, which means that leveraged firm's generate poor performance and the value of a firm may be generally discounted by the market. It is worth noting that SOE has a negative effect on all the firm performance measures. Although, previous studies show that SOEs exhibit improved performance post listing (Megginson et al., 1994; Boubakri and Cosset, 1998), however, we argue that our findings are not surprising. The existence of political connections does not indicate better firm performance as SOEs in China have different objectives - primarily driven by the decentralization of the resources and not to establish internal capital markets (Chen et al., 2011). Lastly, firms with higher management shareholding post-listing shows improved long-run performance due to vested managerial interest in the firm.

**[Please insert Table 3 about here]**

To ensure the reliability of our results, we repeat the PSM technique using different matching criteria like, profitability, leverage, state ownership, ownership concentration, sales growth, among others, along with the IPO-firm industry and IPO year. Across all the models, the findings remain robust.<sup>8</sup> To summarize, similar to the findings in developed economies

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<sup>8</sup> For brevity, we do not report these results, but they are available from the authors upon request.

(Megginson and Weiss, 1991; Brav and Gompers, 1997), VC-backed firms in China outperform non-VC-backed firms in terms of both profitability and available growth opportunities.

#### 4.2. Does VC experience contribute to post-IPO performance?

After confirming that the VC-backed firms outperform non-VC-backed firms, in this subsection we test the validity of our first hypothesis, *i.e.* whether VC experience adds value to their portfolio companies. As previously discussed, the VC's monitoring role after listing may have direct implications for the investors (Brav and Gompers, 1997). We believe that different aspects of the VC experience can have a direct impact for their potential portfolio firms, who rely heavily on VC advisory services and risk capital for their growth. We thus argue that firms backed by experienced VCs have superior performance. To test hypothesis 1, the following random effect panel regression<sup>9</sup> is employed:

$$Performance = \alpha + \beta_{year} + \beta_{ind} + \beta_1 VC\_EXP + \beta_2 IPO\_AGE + \beta_3 SOE + \beta_4 SIZE + \beta_5 LEVERAGE + \beta_6 MNGT\_SHARE + \epsilon \quad (2)$$

In the above model, performance represents one of the four long-run performance measures of the newly listed firm: ROA, Tobin's Q, annual stock return or growth of sales;  $\beta_{year}$  and  $\beta_{ind}$  are vectors of year fixed effects to control for economic conditions, and industry fixed effects to control for industry differences, respectively. In *EQ. 2* above, we primarily focus on the co-efficient  $\beta_1$  on VC\_EXP, which represents one of the four measures of VC's experience that can impact the long-run performance of the portfolio firm. These measures comprise VC\_AGE, VC\_SPEC, AVG\_VC\_INVEST or VC\_IPO\_RATIO. We also control for a number of firm-level factors that can directly affect the performance of the IPO firm.

Table 4 reports the regression results for the relationship between VC experience measures and long-run firm performance. The results in Models (1) – (4) show that VC age has a significant and positive impact on firm performance, which indicates that mature VC firms are able to assist their portfolio firms in obtaining higher profitability. We believe that IPOs backed by mature VC firms perform better, partially because younger VCs bring their portfolio firms to the market prematurely and partially because the experience of the mature VCs help them to mitigate adverse selection problem (Wang et al., 2003). Models (5) – (8) are the regression results between VC specialization and firm performance, where VC specialization

is a dummy variable equal to one if VC's area of specialization is similar to the main industry of operation for the newly listed portfolio firm. As can be seen, VC specialization; on average has positive and significant impact on firm performance, suggesting that VC's area of expertise is recognized by investors and adds value to firm's long-run performance. Further, Models (9) – (12) show that VC's historical average investments in general has a positive effect on firm performance, suggesting that VC's past investment experience can be applied to their future investment projects. Lastly, Models (13) – (16) are the regression results between VC success rate and firm performance. As can be seen, VC success rate, on average has positive impact on firm performance, suggesting that VC's historical success is recognized by investors and adds value to a firm's long-run performance.

**[Please insert Table 4 about here]**

Above regressions for VC experience and post-IPO long-run performance also show firm size is positively related to firm performance (with an exception of annual stock return), indicating that larger firms are able to generate higher profitability as they are more resourceful. In addition, leverage ratio has negative and significant impact on ROA and Tobin's Q, implying that firms with a large ratio of debt generate poor performance and the value of said firms may be generally discounted by the investors.

Overall, the results suggest that our lead VC experience measures consistently have significant and positive effect on long-run firm performance of their portfolio firm. The logic is that a record of successful IPO listings by more experienced VCs facilitates more frequent and larger future fund-raising. Besides, IPO success can provide VC firms with better access to attractive investment opportunities and the ability to negotiate investment terms in the best interest of both the VC and the portfolio firms. Furthermore, superior post-IPO performance attracts investors to future IPOs backed by these more experienced VCs, thereby increasing the probability of successful IPOs for the firms backed by these experienced VCs. In brief, past success helps facilitate future success for these experienced VCs. The results support our hypothesis 1.

#### *4.3. Endogeneity issues regarding VC experience: Instrumental variable analysis*

The estimates in the previous subsection not only show a strong and positive relationship between VCs and their portfolio firm performance, but also suggest that the extent

of the positive effect of VCs on the long-run performance of their portfolio firms is further enhanced by their experience. Although the PSM methodology helps us to control for the sample selection issues, it has certain limitations; for example, it fails to capture the effects of unobservable variables. Several missing variables, not VC involvement, may contribute to improved performance of the portfolio firms. For instance, an important concern about our VC experience results is whether experienced VCs actually add value to their portfolio firms or whether they simply select higher quality entrepreneurial firms that are more likely to succeed (Guo and Jiang, 2013). In this case, the value-added effects of the venture investment we report in Table 4 may be inflated. A widely shared view in the entrepreneurial finance literature is that VC investors hold superior screening capabilities (Brander et al., 2002) to more effectively address information asymmetry issues than traditional financial intermediaries (Gompers and Lerner, 2001; Gorman and Sahlman, 1989). In particular, there may be unobservable factors that affect both the likelihood of investment by VCs in an entrepreneurial firm as well as the probability of a successful outcome of their investment.

To address the above identification concerns due to the unobservable variables, we employ Two Staged Least Square Regression (2SLS) for identifying the value-added effects of VCs by using the instrumental variable IPO\_NO. IPO\_NO is the total number of IPOs from the province where the VC firm is located one year prior to the portfolio firm goes public that has attracted VC investment to control for the endogeneity problem (sentence needs rewording). Before 2003, China used quota system for IPOs, in which the provincial governments allocated quotas to selected firms to not only go public, but also the total number of shares to be issued by the firm. Even after the quota system was forgone in 2003, China Securities Regulatory Commission (CSRC) has still maintained a tight control on IPO allocation in China (Guo and Jiang, 2013). Therefore, we believe that the post-listing performance of the portfolio firm is unlikely to be related with the total number of IPOs at the provincial level in a financial year. However, the instrument relevance can be supported by economic argument that the experienced and specialized VC-backed firms in a province have higher probability to go public, which increases the total number of IPOs. Thus IPO\_NO can pass the exclusion requirement of instrumental variable.

At the first stage, endogenous variable, VC experience, is regressed upon instrumental variables? along, with the other exogenous variables and the fitted values are saved. In the second stage, the original dependent variables (long-run performance of the VC-backed firm) are regressed upon predicted values of endogenous regressors and exogenous variables. The two-stage regression model is described below:

$$\text{Stage1: } VC\_EXP = \alpha + \beta_{year} + \beta_{ind} + \beta_1 IPO\_NO + \beta_2 VC\_NO + \beta_3 IPO\_AGE + \beta_4 SOE + \beta_5 SIZE + \beta_6 LEVERAGE + \beta_7 MNGT\_SHARE + \epsilon \quad (3)$$

$$\text{Stage2: } Performance = \alpha + \beta_{year} + \beta_{ind} + \beta_1 \widehat{VC\_EXP} + \beta_2 IPO\_AGE + \beta_3 SOE + \beta_4 SIZE + \beta_5 LEVERAGE + \beta_6 MNGT\_SHARE + \epsilon \quad (4)$$

Where performance represents one of the four long-run performance measures of the newly listed firm: ROA, Tobin's Q, annual stock return or growth of sales; VC\_EXP is one of the VC experience measures as discussed in EQ2 above: VC\_AGE, VC\_SPEC, AVG\_VC\_INVEST or VC\_IPO\_RATIO;  $\beta_{year}$  and  $\beta_{ind}$  are vectors of year fixed effects to control for economic conditions, and industry fixed effects to control for industry differences, respectively. In stage 2,  $\widehat{VC\_EXP}$  is the fitted value of VC experience from the first stage of the 2SLS model.

Model (1) - (12) in Table 5 shows the results for the second stage of our 2SLS estimation model. Here, VC\_EXP is instrumented by IPO\_NO. In the first stage, all the four proxies of VC\_EXP is positive and significant with respect to the instrumental variables *i.e.* IPO\_NO. Next, the instrumented VC experience measures in the second stage (Table 5) are positive and significantly correlated with all the four proxies of long-run VC-backed firm performance. The results are consistent with the one reported in Table 4. This suggests that the positive effect of VCs is magnified for portfolio firms which attract investment from the experienced VCs. We also conduct two-stage estimations for the PSM sample and find that the effects of VC experience on firm performance remain robust.<sup>10</sup>

**[Please insert Table 5 about here]**

In sum, using the 2SLS estimation enables us to identify the effects of VC experience on portfolio firm performance. The results of the two-staged least square regressions confirm the value-added effects of VC experience on profitability, annual stock return, growth opportunities, and growth in sales of the VC-backed portfolio firms. This further supports our hypothesis 1.

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<sup>10</sup> For brevity we do not report these test results, but they are available from the authors upon request.

#### 4.4. *Does VC experience improve portfolio firm governance?*

The results in last two subsections clearly indicate that IPO firms that attract the investment of the experienced VCs have superior long-run performance, while the superior performance remains unchanged after controlling for VC selectivity. This raises the natural question of how VC experience influences other aspects of the portfolio firm, post-listing through their advisory and monitoring service. In short, our next goal is to examine whether VC experience is associated with stronger corporate governance in the post-IPO period.

To address the firm-level governance issues, we look into an array of annual board characteristics of both VC-backed and non-VC-backed firms. We first focus on board independence, which is treated as an essential element of “good” corporate governance in China (Liu et al., 2015; Wang et al., 2019). The first measure of board independence is the proportion of independent directors on the firm’s board (IND\_DIRECTOR) and the second measure is CEO duality (DUALITY). CEO duality is the separation of a firm's CEO from the position of board Chairman (Fama and Jensen, 1983). CEO-Chairman duality is 1 if the CEO of a firm is also the board Chairman and zero otherwise. We employ this variable as Jensen (1993) argues that Chairman-CEO duality gives the CEO excessive power over the decision-making process, and the separation of CEO and Chairman roles strengthens board independence and increases board oversight of senior management team.

The second dimension of corporate governance is the alignment of interests between shareholders and senior executives. Conflict of interest between executives and shareholders is a classic issue that results in principal-agent problem. A compensation plan that aligns with the interests of the two parties may give senior executives a better incentive to maximize shareholder return and improve firm performance (Adams and Ferrira, 2008; Murphy, 2008). Meanwhile, Jensen and Meckling (1976) suggests that the cost of deviating from value-maximization for stockholders declines as management’s stock ownership rises. When senior executives have higher stakes in the firm, they bear a larger proportion of such costs and are less likely to squander corporate wealth. Therefore, we measure the alignment of managerial interests in two ways, by focusing on the stockholdings of management teams (MNGT\_SHARE) and CEO compensation (CEO\_PAY).

The third dimension of corporate governance in this paper is ownership concentration (OWNER\_CONC). Concentrated ownership leads to serious agency problems (La Porta et al., 1999). For example, prior studies find that in a weak legal environment like China (Allen et al.,



2005), controlling shareholders can expropriate minority shareholders and adversely affect the value of the firm (Chen, 2015).

Models (1) – (5) in Table 6 presents the results for VC dummy and corporate governance. In these five models, we study the aggregate effect of VC investment in both VC-backed and non-VC-backed firms in China. Model (1) indicates that VC-backed firms have more independent directors (Co-eff. = 0.004, T-stat. = 3.96) whereas Model (2) shows that VC-backed firms faces lower duality problems (Co-eff. = -0.102, T-stat. = -11.29). In addition, Models (3) and (4) indicate that VC-backed firms are more likely to allocate equity incentives to management team (Co-eff. = 0.079, T-stat. = 25.88) and higher CEO compensation (Co-eff. = 0.146, T-stat. = 8.76) than non-VC-backed firms. Lastly, Model (5) indicates that VC-backed firms have less ownership concentration (Co-eff. = -0.030, T-stat. = -7.44) problem.

**[Please insert Table 6 about here]**

Models (6) – (10) reports the results for VC experience and VC-backed firm-level corporate governance. As can be seen from the results, VC age (VC\_AGE) presents positive effect on the proportion of independent directors and CEO compensation, while negative impact on CEO duality and ownership concentration, indicating that matured VCs are able to enhance better corporate governance mechanisms for portfolio firms. The results indicate that VC experience can be acquired overtime, and then implemented to generate superior performance. However, the results for VC specialization in the same industry as that of the portfolio firm (VC\_SPEC), average prior investment by the VC firm (AV\_VC\_INVEST), and its historical success rate in reference to the corporate governance of their portfolio firms are less significant. Although, all the proxies of VC experience show a negative and significant impact on ownership concentration.<sup>11</sup>

In summary, VC-backed firms have significantly higher probability of allocating ownership to senior executives than non-VC-backed firms and are also able to better align the interests of executives and shareholders. VC-backed firms are associated with more independent directors and less duality problems. In addition, the incentive pay for CEOs are higher for VC-backed IPO firms, with lower ownership concentration problem. Hence, we can

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<sup>11</sup> Following Table 4 models, when we regress portfolio-firm governance measures one-at-time on VC\_EXP proxies, we obtain theoretically consistent, and statistically stronger results. The results are not reported here but they are available from the authors upon request.

easily argue that the VC-backed firms exhibit better corporate governance mechanisms, which is further enhanced by matured VCs. This is exactly in line with our hypothesis 2.

## 5. Additional robustness checks

### 5.1. VC effectiveness using stock ownership in the portfolio firm

From the analysis conducted in the previous section, the VC backing and VC experience has emerged as a consistent predictor of portfolio firm's superior post-IPO performance and improved corporate governance. Although, it is easy to argue that the parameter estimates in the last section could be biased, since it is a possibility that better portfolio firms are matched with more experienced VCs in the industry. Basically, experienced VCs might be picking winners (Guo and Jiang, 2013). As a result, the performance of VC firms and their portfolio companies may be due to the quality of the companies themselves rather than any additional value added through VCs' experience. In prior analysis, we try to capture the quality of portfolio companies using 2SLS correction procedure. In this subsection, we will discuss additional tests to analyze the robustness of our two key hypotheses.

People may argue that the positive and significant results of VC dummy on firm performance might only be a result of "lucky investment", *i.e.* the result is not economically significant. Therefore, we employ VC ownership in the company to account for the contribution of the VC firm in post-IPO growth of their portfolio firm. We analyze whether portfolio firms with VC being one of the top ten shareholder perform better than firms without VC shareholding. We conduct our random-effect panel regressions in Table 7. Our VC ownership (VC\_SHARE) measure is the proportion of lead VC shareholding in their portfolio firm during the post-IPO period.

**[Please insert Table 7 about here]**

Models (1) - (4) are the results of VC ownership with portfolio firm performance, in which VC ownership has significant positive effects on ROA and stock return. This is contradictory to the prior evidence reported for developed markets, where significant ownership in VC-backed firms exhibit lower stock market returns (Megginson and Weiss, 1991) and inferior post-IPO operating performance (Wang et al., 2003). Next, in Models (5) - (9) we find that the coefficient on the independent director and CEO's compensation are positive and

significant, and the effect of the proportion of VC shareholding is negative and significant with respect to CEO duality and ownership concentration. This is consistent with Krishnan et al. (2011) that experienced VCs exhibit more active post-IPO involvement in the corporate governance of their portfolio firms, and this continued VC involvement in the firm of significant shareholding positively influences post-IPO firm performance. In sum, when VC firms retain significantly higher holding in their portfolio firms post-listing, compared to the VCs that either exit or only retain a small proportion of stock interest in their portfolio firm post-IPO, not only contribute towards their improved long-run performance, but also works in favor of modern corporate governance outcomes and board processes of their portfolio firms.

### *5.2. Endogeneity issues regarding VC effectiveness: Instrumental variable analysis*

The estimates in the previous subsection show a strong and positive relationship between VCs holding in the portfolio firm post-listing and long-run performance and corporate governance of the VC-backed firm. One may argue that the results may be driven by other unobservable variables. Several missing variables, not VC involvement, may contribute to the improved performance and better corporate governance mechanism of portfolio firms post-listing. In this case, the value-added effects of the level of VC investment we find in the last section may be inflated. To address this identification concern due to unobservable variables, we again employ the 2SLS procedure to identify the value-added effect of the level of VC investment in the portfolio firm. We particularly employ two instrumental variables IPO\_NO and VC\_NO as illustrated in section 4.3. The results for the second stage of 2SLS estimation model are tabulated in Table 8.

**[Please insert Table 8 about here]**

Models (1) – (4) presents the results for VC shareholding and portfolio firm performance. The positive and significant coefficients across all the four models indicate that higher VC ownership generates better firm performance, as measured by ROA, annual stock return and growth of sales, along with higher growth opportunities. Models (5) – (9) show the results for the effect of VC ownership on portfolio firm governance. As can be seen from the results, high VC ownership presents significant positive effects on proportion of independent directors on the board and CEO compensation, while negative and significant impact on CEO duality, indicating that higher VC ownership generates better monitoring effect leading to

improved governance mechanisms for portfolio firms. The results confirm that the level of VC involvement in portfolio firms increases performance and enhances the board process efficiency through VC's active monitoring, even after controlling for potential endogeneity issues.

### 5.3. *Other robustness tests*

In unreported tests, although we control for year fixed effects in all our regressions, we also run our analysis after excluding the internet bubble period (1998-2000), and the financial crisis period (2008-2009), and find that our results are statistically and economically consistent with the overall thesis of the paper. Thus, we believe that our results are not driven by the periods of extreme financial crisis. Besides, it is a common practice that high technology sector firms attract substantial VC investment compared to the firms in other industries. Therefore, to ensure that our findings are not influenced by the presence of high technology firms, we re-run our models after excluding the firms in this sector from both VC-backed and non-VC-backed sample.<sup>12</sup> The results are qualitatively similar.

## 6. **Conclusion**

This paper examines the contribution of VC experience towards the post-IPO performance of entrepreneurial firms in China. Based on the results of firm-level panel data analysis, we find that VC-backed firms outperform non-VC-backed firms in terms of profitability, market recognition, and sales growth. Among the various VC experience measures that we study, we find that VC age, specialization in a specific sector, and prior investment experience consistently exhibits a significant and positive relation with all the long-run performance measures. We use the PSM methodology to distinguish the effects of the ex-ante screening and ex-post monitoring efforts of VCs. At the same time, we use the 2SLS estimation to address identification issues; and the results remain robust. These findings suggest that VCs operating in China function similarly to those in developed economies (Chemmanur et al., 2011; Krishnan et al., 2011; Guo and Jiang, 2013); *i.e.* the continued post-IPO support and development of portfolio firms by more experienced VCs positively affects their long-term performance. Next, we also address the conundrum behind this phenomenon.

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<sup>12</sup> For brevity, the results for the sample that excluded high technology sector firms are not reported in the tables. Instead, we follow the prior studies on VC investment and report findings for the whole sample.

We find that VC-backed firms have significantly higher probability of allocating ownership to senior executives than non-VC-backed firms and so are able to better align the interests of the executives and the shareholders. VC-backed firms are associated with more independent directors, less duality problems and ownership concentration. Simply put, VC-backed firms exhibit better corporate governance mechanisms.

This study contributes to the literature on VC investment as it is among the first of the systematic estimations on the contribution of VC experience on firm performance and corporate governance to entrepreneurial firms in an emerging market setting, *i.e.* China, where the financial and legal systems are distinctly different from those in Western countries (Allen et al., 2005). This study also contributes to the practice of VC industry. We find that the bulk of the value that VC adds is the result of their monitoring and active involvement in corporate governance. The results suggest that entrepreneurs should consider VC a valuable source of finance and corporate discipline that can improve the entrepreneurial company's chances of successful IPO, and long-run performance. In addition, our findings suggest that the regulators should work towards improving the market conditions and regulatory framework for VC's to enhance the market efficiency, as such investments tend to pursue not only positive financial returns but also significant social payoffs and localized public benefits. Lastly, besides mutual funds (Firth et al., 2016), we believe that we have been able to successfully contribute to the growing literature on the positive role of institutional oversight in China by documenting the importance of VC investment as an informal institution that alleviates frictions in settings where formal institutions offer limited protection to investors.

The current study, besides extending the existing literature on the positive role of VC investment (Chemmanur et al., 2011; Krishnan et al., 2011; Guo and Jiang, 2013), raises some interesting questions for further research. First and foremost is, if lead VC experience enhances the financial performance and governance outcome of the portfolio, what is the exact role of other syndicated partners? Next, it will be interesting to know what investment approach, and consulting services rendered by the VC managers to their client portfolio firms leads to such superior performance. In addition, VC industry in China is relatively young, growing at an exponential rate, while simultaneously experiencing a dynamic environment wherein a series of regulatory policies are being regularly put forward. Further studies may also take into consideration the effect of changes in regulatory policies overtime on the performance of portfolio firms. Finally, we will like to acknowledge that our results could suffer from survivorship bias, which could have two opposing effects. On the one hand, firms that do not obtain VC funding might go bankrupt more often. On the other hand, the VC financed firms

might aim for higher growth which could increase the risk of failure. Hence, it remains uncertain how a survival bias might affect the findings.

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**Table 1. Industrial classification for VC-backed and non-VC-backed IPOs in China**

This table reports the distribution of the IPO firms used in this study from 1996 to 2014 using China Securities Regulatory Commission (CSRC) industrial classification system. We report the total number of firms in each industry, and then the split if they were backed by the VC firm or not backed by the VC firm.

CSRC code	Classification	No.(%) of IPOs	Non-VC-Backed		VC-backed	
A	Farming, Forestry, Animal Husbandry, and Fishery Services	45 (1.99%)	36	80.00%	9	20.00%
B	Coal Mining and Dressing	38 (1.68%)	30	78.95%	8	21.05%
C	Manufacturing	1,461 (64.56%)	1,058	72.42%	403	27.58%
D	Production and Supply of Electricity, Gas and Water	57 (2.52%)	57	100.00%	0	0.00%
E	Construction	50 (2.21%)	40	80.00%	10	20.00%
F	Transportation, Storage Industry	68 (3.00%)	62	91.18%	6	8.82%
G	Information Technology	188 (8.31%)	116	61.70%	72	38.30%
H	Retail Industry	99 (4.37%)	91	91.92%	8	8.08%
I	Finance and Insurance	46 (2.03%)	23	50.00%	23	50.00%
J	Real Estate Development and Management	46 (2.03%)	45	97.83%	1	2.17%
K	Public Facilities Services	64 (2.83%)	50	78.13%	14	21.88%
L	Communication and Culture	27 (1.19%)	17	62.96%	10	37.04%
M	Conglomerates	67 (2.96%)	65	97.01%	2	2.99%
N	Ecological protection and environmental governance	5 (0.22%)	4	80.00%	1	20.00%
R	Entertainment Industry	2 (0.09%)	2	100.00%	0	0.00%
Total		2,263 (100%)	1,696	74.94%	567	25.06%

**Table 2: Summary statistics**

This table reports the descriptive statistics of variables for our Chinese A-share listed firms used in this study from 1996 to 2014. We report the number of observations, mean, standard deviation, median, and 5<sup>th</sup> and 95<sup>th</sup> percentile values of all the main variables used in this study. In Panel A we report the descriptive statistics for all the firm-years included in this study, and Panel B and Panel C reports the basic descriptive statistics divided based on VC-backed and non-VC-backed firms at the time of listing respectively. In Panel D we report the difference in mean between the VC-backed and non-VC-backed Chinese firms using the two-sample mean-comparison test (T-statistics). Detailed definition of the variables is reported in Appendix A1.

Summary Statistics														
Variable	Unit	Panel A: Full Sample						Panel B: VC-backed			Panel C: Non-VC-backed			Panel D: Diff. In Mean
		Obs.	Mean	Std. Dev.	5%	Median	95%	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	
ROA	Ratio	18,967	0.036	0.045	-0.063	0.033	0.122	2,631	0.046	0.041	16,336	0.034	0.046	0.012***
TOBIN_Q	Ratio	18,967	1.938	1.499	0.367	1.467	5.855	2,631	2.544	1.548	16,336	1.841	1.468	0.704***
STOCK_RET	Return	18,967	0.303	0.400	-0.300	0.202	1.101	2,631	0.404	0.303	16,336	0.303	0.404	0.101***
G_SALES	Ratio	18,967	0.160	0.304	-0.306	0.120	0.899	2,631	0.205	0.286	16,336	0.153	0.306	0.052***
SOE	Dummy	18,967	0.453	0.498	0.000	0.000	1.000	2,631	0.119	0.323	16,336	0.506	0.500	-0.388***
IPO_AGE	Natural Log	18,967	2.169	0.660	0.908	2.324	3.008	2,631	1.454	0.450	16,336	2.285	0.615	-0.830***
LEVERAGE	Ratio	18,967	0.470	0.208	0.115	0.476	0.830	2,631	0.347	0.188	16,336	0.489	0.204	-0.143***
SIZE	Natural Log	18,967	21.834	1.426	20.049	21.645	24.324	2,631	21.567	1.233	16,336	21.877	1.451	-0.309***
MNGT_SHARE	Ratio	18,967	0.085	0.176	0.000	0.000	0.530	2,631	0.250	0.221	16,336	0.058	0.152	0.191***
IND_DIRECTOR	Ratio	18,967	0.366	0.054	0.333	0.333	0.444	2,631	0.369	0.050	16,336	0.366	0.055	0.004***
DUALITY	Dummy	18,967	0.794	0.404	0.000	1.000	1.000	2,631	0.614	0.487	16,336	0.823	0.381	-0.209***
OWN_CONC	Ratio	18,967	0.313	0.191	0.030	0.305	0.634	2,631	0.280	0.168	16,336	0.318	0.194	-0.038***
CEO_PAY	Natural Log	14,631	12.460	2.264	10.954	12.843	14.072	2,152	12.949	1.339	12,479	12.375	2.383	0.574***
VC_SHARE	Ratio							2,631	0.309	0.142				
VC_AGE	Natural Log							2,631	2.497	0.730				
VC_SPEC	Dummy							2,631	0.521	0.500				
AVG_VC_INVEST	Natural Log							2,631	1.772	0.753				
VC_IPO_RATIO	Ratio							2,051	0.315	0.218				

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01

**Table 3: The performance of VC-backed firms and non-VC-backed firms**

This is a series of random effect panel regressions for the profitability and growth opportunity of VC-backed and non-VC-backed firms. The observations are firm-year units of the sampled 567 VC-backed firms and their non-VC-backed counterparts (one-to-five pairs matched using different firm level criteria). The dependent variables include ROA, TOBIN\_Q, STOCK\_RET and G\_SALES. Key explanatory variable is VC\_BACK, a dummy variable that equals to one if the firm is backed by venture investment and zero if otherwise. Other control variables include IPO age, which is the age of the firm since it is listed on of the two stock exchanges in China; SOE, which is a dummy variable equal to one if the firm is stated-owned and 0 otherwise; SIZE, which is measured by the log transformation of total assets; LEVERAGE, which is the firm's leverage ratio; MNGT\_SHARE, which is the percentage of management shareholdings. Values in parenthesis below each coefficient are their respective robust t-statistics, clustered at firm-level. Sample period is from 1996 to 2014. Constant, industry fixed effects, and year fixed effects are included in all the regressions. Detailed definition of the variables is reported in Appendix A1.

VARIABLES	(1) ROA	(2) TOBIN_Q	(3) STOCK_RET	(4) G_SALES
VC_BACK	0.001* (1.84)	0.037* (1.85)	0.014** (2.47)	0.045*** (8.33)
IPO_AGE	-0.009*** (-8.79)	-0.161*** (-6.59)	-0.030*** (-5.70)	-0.034*** (-5.15)
SOE	-0.003*** (-3.74)	-0.114*** (-6.16)	-0.023*** (-5.85)	-0.021*** (-4.20)
SIZE	0.004*** (13.97)	-0.520*** (-84.47)	0.116*** (48.87)	0.028*** (15.70)
LEVERAGE	-0.000*** (-4.00)	-0.001 (-0.73)	-0.356*** (-35.85)	-0.000 (-1.07)
MNGT_SHARE	0.039*** (17.33)	0.580*** (10.28)	0.213*** (16.27)	0.136*** (9.05)
Observations	18,967	18,967	18,967	18,967
R-squared	0.077	0.455	0.169	0.068
Year Fixed Effects	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01

**Table 4: VC experience and post-IPO performance**

This is a series of random effect panel regressions for the VC experience and post-IPO performance. The observations are firm-year units of the sampled 567 VC-backed firms. Key explanatory variables include VC\_AGE to capture the maturity of the VC firm; VC\_SPEC, which is equal to one if VC's specialized industry is the same as the IPO firms' main industry of operation, and 0 otherwise; AVG\_VC\_INVEST, which is the average historical logarithmic investment per firm made by VCs. All the other control variables and dependent variables are the same as the one discussed in Table 3. Values in parenthesis below each coefficient are their respective robust t-statistics, clustered at firm-level. Sample period is from 1996 to 2014. Constant, industry fixed effects, and year fixed effects are included in all the regressions. Detailed definition of the variables is reported in Appendix A1.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	ROA	TOBIN_Q	STOCK_RET	G_SALES	ROA	TOBIN_Q	STOCK_RET	G_SALES	ROA	TOBIN_Q	STOCK_RET	G_SALE_S	ROA	TOBIN_Q	STOCK_RET	G_SALE_S
VC_AGE	0.001** (2.48)	0.029** (2.38)	0.004** (1.99)	0.005** (2.18)												
VC_SPEC					0.003* (1.86)	0.027** (2.27)	0.017* (1.89)	0.005 (0.44)								
AVG_VC_INVEST									0.008** (2.14)	0.070*** (3.07)	0.007 (0.79)	0.004*** (4.05)				
VC_IPO_RATIO													0.003 (1.21)	0.134* (1.84)	0.020 (0.85)	0.002 (0.08)
IPO_AGE	0.005** (2.28)	-0.007 (-0.12)	0.035*** (2.92)	-0.029* (-1.95)	0.005** (2.28)	-0.007 (-0.12)	-0.041*** (-3.32)	-0.029* (-1.95)	0.004** (2.26)	-0.005 (-0.08)	0.041*** (3.33)	-0.030** (-2.03)	0.005*** (3.01)	0.003 (0.06)	0.033** (2.54)	-0.017 (-1.37)
SOE	-0.005** (-2.08)	-0.016 (-0.22)	-0.038** (-2.43)	-0.027 (-1.53)	-0.005** (-2.08)	-0.016 (-0.22)	-0.011 (-0.72)	-0.027 (-1.53)	-0.005** (-2.07)	-0.014 (-0.20)	0.010 (0.67)	-0.029 (-1.64)	0.004** (2.10)	0.060 (0.96)	0.009 (0.51)	-0.013 (-0.81)
SIZE	0.006*** (6.40)	0.561*** (20.26)	-0.097*** (-14.94)	0.035** (5.17)	0.006*** (6.38)	0.560*** (20.24)	-0.134*** (-19.92)	0.036** (5.19)	0.006*** (6.34)	0.564*** (19.92)	0.135*** (19.62)	0.042*** (5.98)	0.010*** (10.64)	-0.315*** (-11.04)	0.142*** (18.65)	0.022*** (3.04)
LEVERAGE	-0.055*** (-17.17)	-1.098*** (-11.41)	0.431*** (13.54)	0.031 (1.30)	-0.055*** (-17.21)	-1.095*** (-11.38)	0.510*** (16.23)	0.031 (1.32)	-0.055*** (-17.18)	-1.096*** (-11.38)	-0.511*** (-16.19)	0.031 (1.32)	-0.095*** (-22.68)	-2.362*** (-17.99)	-0.561*** (-16.09)	0.081** (2.47)
MNGT_SHARE	0.014*** (3.78)	0.071 (0.65)	-0.131*** (-5.23)	0.114** (4.25)	0.014*** (3.73)	0.074 (0.68)	-0.147*** (-6.13)	0.114** (4.26)	0.014*** (3.74)	0.076 (0.70)	0.147*** (6.11)	0.106*** (3.96)	0.009*** (2.76)	-0.024 (-0.24)	0.140*** (5.32)	0.094*** (3.81)
Observations	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,104	2,104	2,104	2,104
R-squared	0.168	0.487	0.205	0.080	0.169	0.487	0.205	0.080	0.168	0.487	0.205	0.086	0.274	0.482	0.235	0.101
Year Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01

**Table 5: Two Stage Least Square Regressions for VC experience and post-IPO performance**

This is a series of second stage of the Two-staged Least Square Regressions for the VC experience and post-IPO performance. The observations are firm-year units of the sampled 567 VC-backed firms. Two instrumental variables are IPO\_NO, which is the total number of IPOs in the industry of portfolio firm in a fiscal year. The dependent variables are ROA, TOBIN\_Q, STOCK\_RET and G\_SALES. Key explanatory variables include VC\_AGE to capture the maturity of the VC firm; VC\_SPEC, which is equal to one if VC's specialized industry is the same as the IPO firms' main industry of operation, and 0 otherwise; AVG\_VC\_INVEST, which is the average historical logarithmic investment per firm made by VCs. All the other control variables are the same as the one discussed in Table 3. Values in parenthesis below each coefficient are their respective robust t-statistics, clustered at firm-level. Sample period is from 1996 to 2014. Constant, industry fixed effects, and year fixed effects are included in all the regressions. Detailed definition of the variables is reported in Appendix A1.

<b>Panel A: First-stage Estimations of the Two-stage Regressions</b>																
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	VC_AG E	VC_AG E	VC_AGE	VC_AG E	VC_SPE C	VC_SPE C	VC_SPE C	VC_SPE C	AVG_VC INVEST	AVG_VC INVEST	AVG_VC INVEST	AVG_VC INVEST	VC_IPO_ RATIO	VC_IPO_ RATIO	VC_IPO_ RATIO	VC_IPO_ RATIO
IPO_NO	-0.001** (-2.12)	-0.001** (-2.12)	-0.001** (-2.12)	-0.001** (-2.12)	0.001** (2.00)	0.001** (2.00)	0.001** (2.00)	0.001** (2.00)	0.001** (2.02)	0.001** (2.02)	0.001** (2.02)	0.001** (2.02)	0.0001* (1.76)	0.0001* (1.76)	0.0001* (1.76)	0.0001* (1.76)
IPO_AGE	0.169** * (4.95)	0.169** * (4.95)	0.169*** * (4.95)	0.169** * (4.95)	0.057** (2.34)	0.057** (2.34)	0.057** (2.34)	0.057** (2.34)	0.136*** (5.56)	0.136*** (5.56)	0.136*** (5.56)	0.136*** (5.56)	-0.049*** (-4.02)	-0.049*** (-4.02)	-0.049*** (-4.02)	-0.049*** (-4.02)
SOE	-0.065 (-1.45)	-0.065 (-1.45)	-0.065 (-1.45)	-0.065 (-1.45)	0.022 (0.68)	0.022 (0.68)	0.022 (0.68)	0.022 (0.68)	-0.022 (-0.67)	-0.022 (-0.67)	-0.022 (-0.67)	-0.022 (-0.67)	0.044*** (2.86)	0.044*** (2.86)	0.044*** (2.86)	0.044*** (2.86)
SIZE	0.097** * (5.30)	0.097** * (5.30)	0.097*** * (5.30)	0.097** * (5.30)	-0.009 (-0.69)	-0.009 (-0.69)	-0.009 (-0.69)	-0.009 (-0.69)	0.195*** (14.74)	0.195*** (14.74)	0.195*** (14.74)	0.195*** (14.74)	0.010 (1.59)	0.010 (1.59)	0.010 (1.59)	0.010 (1.59)
LEVERAGE	0.196** (2.17)	0.196** (2.17)	0.196** (2.17)	0.196** (2.17)	-0.120* (-1.85)	-0.120* (-1.85)	-0.120* (-1.85)	-0.120* (-1.85)	-0.180*** (-2.80)	-0.180*** (-2.80)	-0.180*** (-2.80)	-0.180*** (-2.80)	-0.022 (-0.70)	-0.022 (-0.70)	-0.022 (-0.70)	-0.022 (-0.70)
MNGT_SHARE	0.079 (1.09)	0.079 (1.09)	0.079 (1.09)	0.079 (1.09)	-0.054 (-1.03)	-0.054 (-1.03)	-0.054 (-1.03)	-0.054 (-1.03)	-0.170*** (-3.29)	-0.170*** (-3.29)	-0.170*** (-3.29)	-0.170*** (-3.29)	0.006 (0.23)	0.006 (0.23)	0.006 (0.23)	0.006 (0.23)
Observations	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,104	2,104	2,104	2,104
R-squared	0.052	0.052	0.052	0.052	0.103	0.103	0.103	0.103	0.106	0.106	0.106	0.106	0.103	0.103	0.103	0.103

  

<b>Panel B: Second-stage Estimations of the Two-stage Regressions</b>																
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	ROA	TOBIN_ Q	STOCK_R ET	G_SAL ES	ROA	TOBIN_ Q	STOCK RET	G_SAL ES	ROA	TOBIN_Q	STOCK_R ET	G_SALES	ROA	TOBIN_Q	STOCK_ RET	G_SALES
VC_AGE	0.119** (2.28)	3.932** (2.27)	1.408** (2.31)	0.792** (2.21)												

VC_SPEC					0.313*	2.379**	3.717*	2.091								
					(1.73)	(2.23)	(1.84)	(1.23)								
AVG_VC_INVEST									0.193*	6.402*	2.292**	1.289*				
									(1.93)	(1.92)	(1.98)	(1.88)				
VC_IPO_RATIO													0.850	3.436*	8.893	6.799
													(0.83)	(1.89)	(0.83)	(0.83)
IPO_AGE	-0.021*	-0.366	-0.251**	-0.114	0.006	0.130	0.073	0.014	0.003	-0.242	0.033	-0.009	0.009	-0.156	0.108	0.054
	(-1.96)	(-1.02)	(-1.99)	(-1.54)	(0.62)	(0.40)	(0.63)	(0.21)	(0.51)	(-1.35)	(0.53)	(-0.23)	(0.57)	(-1.38)	(0.63)	(0.41)
SOE	-0.001	0.121	0.027	0.047	-0.000	0.171	-0.045	-0.057	0.011	0.208	0.090	0.020	-0.027	0.064	-0.325	-0.273
	(-0.24)	(0.59)	(0.38)	(1.11)	(-0.00)	(0.43)	(-0.32)	(-0.72)	(1.64)	(0.90)	(1.13)	(0.41)	(-0.62)	(0.21)	(-0.72)	(-0.79)
SIZE	-	-	-0.259***	-0.098**	0.007	-0.363**	0.138**	0.030	-0.032*	-0.942	-0.329	-0.233*	-0.003	0.385***	0.044	-0.052
	0.017**	0.701**														
	*	*														
	(-2.91)	(-3.55)	(-3.74)	(-2.41)	(1.54)	(-2.40)	(2.57)	(0.98)	(-1.67)	(-1.46)	(-1.47)	(-1.75)	(-0.23)	(5.12)	(0.39)	(-0.59)
LEVERAGE	0.050**	-	0.030	-0.281**	-0.052*	-	-0.054	0.267	-0.046**	3.449***	0.020	0.309**	-0.043	1.955***	0.004	0.431
	*	3.311**				3.243**										
		*				*										
	(2.93)	(-5.82)	(0.15)	(-2.39)	(-1.71)	(-3.22)	(-0.15)	(1.32)	(-2.10)	(4.75)	(0.08)	(2.06)	(-0.75)	(4.91)	(0.01)	(0.93)
MNGT_SHARE	-0.014	-0.125	-0.164	-0.126**	0.036	-0.844	0.421	0.271	0.044**	1.129*	0.523**	0.328**	-0.013	0.180	-0.101	-0.074
	(-1.57)	(-0.42)	(-1.56)	(-2.04)	(1.37)	(-0.98)	(1.38)	(1.56)	(2.20)	(1.68)	(2.24)	(2.37)	(-0.40)	(0.80)	(-0.29)	(-0.28)
Observations	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2104	2104	2104	2104
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Year Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

\*\*\* p<0.01, \*\* p<0.05, \* p<0.

**Table 6: VC experience and corporate governance of the portfolio firm**

This is a series of random effect panel regressions for the VC experience and the corporate governance of the portfolio firm. The observations are firm-year units of the sampled 567 VC-backed firms and their non-VC-backed counterparts (one-to-five pairs matched using different firm level criteria) for Models (1) to (5), and only 567 VC-backed firms for Models (6) to (10). The dependent variables include IND\_DIRECTOR, which is the percentage of independent directors on board; DUALITY, which equal to 1 if CEO and chairman is the same person and 0 otherwise; MNGT\_SHARE, which is the percentage of management shareholding; CEO\_PAY, which is the total compensation of CEO; OWNER\_CONC, which is the top shareholder' shareholding. Key explanatory variables include VC\_BACK, VC\_AGE, VC\_SPEC, and AVG\_VC\_INVEST as discussed in Table 3. All the other control variables are the same as the one discussed in Table 3. Values in parenthesis below each coefficient are their respective robust t-statistics, clustered at firm-level. Sample period is from 1996 to 2014. Constant, industry fixed effects, and year fixed effects are included in all the regressions. Detailed definition of the variables is reported in Appendix A1.

VARIABLES	(1) IND_DIRECTOR	(2) DUALITY	(3) MNGT_SHARE	(4) CEO_PAY	(5) OWNER_CONC	(6) IND_DIRECTOR	(7) DUALITY	(8) MNGT_SHARE	(9) CEO_PAY	(10) OWNER_CONC
VC_BACK	0.004*** (3.85)	-0.103*** (-11.37)	0.079*** (25.80)	0.148*** (8.65)	-0.030*** (-7.41)					
VC_AGE						0.003*** (2.72)	-0.049*** (-3.67)	0.003 (0.64)	0.037** (2.43)	-0.016*** (-3.35)
VC_SPEC						0.000 (0.18)	0.026 (1.38)	-0.005 (-0.67)	-0.003 (-0.15)	-0.016** (-2.53)
AVG_VC_INVEST						-0.002 (-1.38)	0.018 (0.98)	0.025*** (3.30)	-0.010 (-0.47)	-0.030*** (-4.60)
VC_IPO_RATIO						0.005 (1.25)	-0.135*** (-2.77)	0.015 (0.78)	0.008 (0.14)	-0.086*** (-5.24)
IPO_AGE	0.006*** (6.04)	0.038*** (4.55)	-0.107*** (-37.85)	0.064*** (4.04)	-0.097*** (-25.83)	-0.008*** (-3.61)	-0.045* (-1.84)	-0.019* (-1.86)	0.063** (2.22)	-0.023*** (-2.64)
SOE	0.005*** (7.13)	0.134*** (21.51)	-0.087*** (-41.43)	-0.087*** (-7.36)	0.064*** (22.82)	-0.003 (-0.96)	-0.250*** (-8.46)	-0.194*** (-16.60)	0.138*** (4.18)	0.033*** (3.28)
SIZE	0.001** (2.26)	0.031*** (10.65)	-0.012*** (-12.22)	0.360*** (63.75)	0.025*** (18.65)	-0.004*** (-3.13)	-0.045*** (-3.27)	-0.031*** (-5.47)	0.351*** (22.32)	0.006 (1.21)
LEVERAGE	-0.000 (-0.01)	0.060*** (3.83)	-0.105*** (-19.35)	-0.650*** (-21.52)	-0.037*** (-5.19)	0.009 (1.63)	0.044 (0.69)	-0.068*** (-2.63)	-0.629*** (-8.68)	-0.067*** (-3.01)
Observations	18,967	18,967	18,967	18,916	18,967	2,104	2,104	2,104	2,104	2,104
R-squared	0.047	0.086	0.378	0.386	0.108	0.036	0.072	0.199	0.363	0.081
Year Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



**Table 7: Robustness test: VC ownership and portfolio firm performance and corporate governance**

This is a series of random effect panel regressions for the effect of VC ownership on portfolio firm performance and their corporate governance. The observations are firm-year units of the sampled 567 VC-backed firms. The dependent variables include ROA, TOBIN\_Q, STOCK\_RET and G\_SALES for firm performance. Corporate governance measures include: IND\_DIRECTOR, DUALITY, MNGT\_SHARE, CEO\_PAY, and OWNER\_CONC. Key explanatory variable is VC\_SHARE, which is the percentage of VC shareholding in the portfolio firm. All the other control variables are the same as the one discussed in Table 3. Values in parenthesis below each coefficient are their respective robust t-statistics, clustered at firm-level. Sample period is from 1996 to 2014. Constant, industry fixed effects, and year fixed effects are included in all the regressions. Detailed definition of the variables is reported in Appendix A1.

VARIABLES	(1) ROA	(2) TOBIN_Q	(3) STOCK_RET	(4) G_SALES	(5) IND_DIRECTOR	(6) DUALITY	(7) MNGT_SHARE	(8) CEO_PAY	(9) OWNER_CONC
VC_SHARE	0.015*** (3.61)	0.086 (0.68)	0.148*** (4.41)	0.044 (1.36)	0.021*** (3.39)	-0.373*** (-5.44)	0.014 (0.49)	0.066 (0.64)	-0.880*** (-53.09)
IPO_AGE	0.006*** (4.06)	0.074 (1.62)	0.046*** (3.73)	0.022* (1.88)	-0.007*** (-3.26)	0.035 (1.43)	0.018* (1.77)	-0.084** (-2.27)	-0.003 (-0.54)
SOE	0.003* (1.90)	0.021 (0.37)	0.008 (0.55)	0.023 (1.60)	-0.003 (-1.07)	0.255*** (8.64)	0.195*** (16.58)	-0.172*** (-3.72)	-0.019*** (-2.71)
SIZE	0.009*** (11.03)	-0.377*** (-15.43)	0.132*** (19.76)	-0.027*** (-4.25)	-0.004*** (-3.00)	0.054*** (4.12)	0.035*** (6.35)	-0.278*** (-13.18)	-0.002 (-0.67)
LEVERAGE	-0.087*** (-22.77)	-2.330*** (-19.90)	-0.502*** (-16.00)	-0.079*** (-2.60)	0.011* (1.83)	-0.045 (-0.71)	0.061** (2.36)	0.617*** (6.50)	0.037** (2.39)
MNGT_SHARE	0.012*** (4.00)	0.073 (0.81)	0.149*** (6.24)	-0.105*** (-4.56)					
Observations	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631
R-squared	0.249	0.516	0.234	0.093	0.037	0.065	0.190	0.120	0.544
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES

\*\*\* p<0.01, \*\* p<0.05, \* p<0.

**Table 8: Two Stage Least Square Regressions for VC ownership and portfolio firm performance and corporate governance**

This is a series of second stage of the Two-staged Least Square Regressions for the VC ownership on portfolio firm performance and their corporate governance. The observations are firm-year units of the sampled 567 VC-backed firms. Two instrumental variables are IPO\_NO, which is the total number of IPOs in the industry of portfolio firm in a fiscal year. The dependent variables include ROA, TOBIN\_Q, STOCK\_RET and G\_SALES for firm performance. Corporate governance measures include: IND\_DIRECTOR, DUALITY, MNGT\_SHARE, CEO\_PAY, and OWNER\_CONC. Key explanatory variable is VC\_SHARE, which is the percentage of VC shareholding in the portfolio firm. All the other control variables are the same as the one discussed in Table 3. Values in parenthesis below each coefficient are their respective robust t-statistics, clustered at firm-level. Sample period is from 1996 to 2014. Constant, industry fixed effects, and year fixed effects are included in all the regressions. Detailed definition of the variables is reported in Appendix A1.

VARIABLES	First stage	Second-stage Estimations of the Two-stage Regressions								
	(0) VC_SHARE	(1) ROA	(2) TOBIN_Q	(3) STOCK_RET	(4) G_SALES	(5) IND_DIRECTOR	(6) DUALITY	(7) MNGT_SHAR E	(8) CEO_PAY	(9) OWNER_CONC
IPO_NO	-0.001*** (-3.10)									
VC_SHARE		0.299** (2.48)	2.073*** (2.91)	2.134** (2.34)	2.637* (1.77)	0.107* (1.92)	-0.454** (-2.07)	0.262 (0.58)	0.377*** (3.14)	0.219 (0.49)
IPO_AGE	-0.032*** (-4.84)	-0.010** (-2.41)	-0.276 (-1.01)	-0.082** (-2.48)	0.116*** (3.29)	0.001 (0.16)	0.143** (2.38)	0.019 (1.14)	0.131 (1.19)	0.039** (2.40)
SOE	0.008 (0.88)	0.010*** (2.84)	0.133 (0.61)	0.059** (2.26)	-0.015 (-0.53)	-0.006** (-2.00)	0.231*** (5.01)	0.201*** (15.87)	-0.300** (-2.55)	-0.030** (-2.47)
SIZE	0.009** (2.42)	0.007*** (4.34)	-0.094 (-0.89)	0.130*** (10.13)	-0.038*** (-2.75)	-0.003** (-2.15)	0.008 (0.35)	0.029*** (4.54)	-0.426*** (-6.58)	-0.009 (-1.47)
LEVERAGE	-0.063*** (-3.62)	-0.098*** (-9.91)	-3.701*** (-5.93)	-0.516*** (-6.88)	0.082 (1.02)	0.007 (0.83)	0.258* (1.89)	0.116*** (3.11)	1.077*** (4.25)	0.112*** (3.07)
MNGT_SHARE	-0.004 (-0.28)	0.010* (1.85)	-0.122 (-0.37)	0.119*** (2.99)	-0.094** (-2.21)					
Observations	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,631	2,150	2,631
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Year Fixed Effects		YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects		YES	YES	YES	YES	YES	YES	YES	YES	YES

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Appendix A1: Description of variables used in this study.

<b>Variable</b>	<b>Definition</b>
<i>VC_BACK</i>	Dummy variable equals to 1 if the portfolio firm is backed by VC firm, and 0 otherwise.
<i>VC_SHARE</i>	Lead VC shareholding divided by total number of shares in the IPO firm, measured at the end of the fiscal year.
<i>VC_SPEC</i>	Dummy variable equals to 1 if VC's specialized industry matched with the portfolio firm, and 0 otherwise, based on Gompers et al. (2009).
<i>VC_AGE</i>	Log transformation of 1 plus the difference in years since the VC firm was established up to the year of observation.
<i>AVG_VC_INVEST</i>	Log transformation of VC's historical average dollar investment (in million US\$) before investing in the current firm.
<i>VC_IPO_RATIO</i>	The number of IPOs taking by the underlying VC divided by the total number of projects that VC exit through IPO and M&A
<i>ROA</i>	Net income divided by total assets of portfolio firm, measured at the end of fiscal year.
<i>TOBIN_Q</i>	Market value divided by the replacement value of the portfolio firm's assets, measured at the end of fiscal year.
<i>STOCK_RET</i>	The average yearly stock return of the portfolio firm.
<i>G_SALES</i>	Current year's sales minus previous year's sales, scaled by previous year's sales, measured at the end of fiscal year.
<i>SOE</i>	Dummy variable equals to 1 if the portfolio firm is state-owned, and 0 otherwise.
<i>IPO_AGE</i>	Log transformation of 1 plus the difference in years since the IPO firm was listed up to the year of observation.
<i>LEVERAGE</i>	Total debt divided by total assets of the IPO firm, measured at the end of fiscal year.
<i>SIZE</i>	Log transformation of total assets of IPO firm (in million ¥), measured at the end of fiscal year.
<i>IND_DIRECTOR</i>	Number of independent directors divided by total board size, measured at the end of fiscal year.
<i>DUALITY</i>	Dummy variable equals to 1 if the CEO also serves as board Chairman, and 0 otherwise.
<i>MNGT_SHARE</i>	Equity holding of the senior management divided by total number of shares in the portfolio firm, measured at the end of the fiscal years.
<i>CEO_PAY</i>	Log transformation of CEO's total salary including allowance, measured at the end of fiscal year.
<i>OWNER_CONC</i>	Equity holding of the largest shareholder in the firm divided by total number of shares in the portfolio firm, measured at the end of fiscal year.

### Appendix A2: Pairwise correlation matrix

This table reports the pairwise correlation matrix for main variables from 1996 to 2014. Detailed definition of the variables is reported in Appendix A1.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1.VC_BACK	1																		
2. ROA	0.096*	1																	
3. TOBIN_Q	0.177*	0.296*	1																
4. STOCK_RET	0.082*	0.784*	0.073*	1															
5. G_SALES	0.070*	0.285*	0.059*	0.300*	1														
6. SOE	-0.269*	-0.067*	-0.244*	-0.002	-0.024*	1													
7. IPO_AGE	-0.436*	-0.201*	-0.149*	-0.154*	-0.112*	0.313*	1												
8. LEVERAGE	-0.238*	-0.041*	0.017*	-0.026*	-0.017*	-0.002*	0.022*	1											
9. SIZE	-0.096*	0.035	-0.451*	0.326*	0.067*	0.263*	0.197*	-0.058*	1										
10. MNGT_SHARE	0.390*	0.177*	0.251*	0.116*	0.067*	-0.415*	-0.543*	-0.018*	-0.190*	1									
11. IND_DIRECTOR	0.039*	0.001	0.082*	0.001	0.005	-0.065*	-0.017*	-0.003*	0.033	0.105*	1								
12. DUALITY	-0.179*	-0.042*	-0.148*	-0.010	-0.010*	0.240*	0.185*	-0.010*	0.138*	-0.243*	-0.098*	1							
13. OWN_CONC	-0.067*	0.070*	-0.098*	0.093*	0.030*	0.203*	-0.096*	-0.011*	0.151*	-0.075*	0.020	0.048*	1						
14. VC_SHARE	0.047*	0.063*	0.012	0.043*	-0.064*	0.020	-0.112*	-0.047*	-0.040	0.019	0.076*	-0.099*	-0.711*	1					
15. VC_AGE	0.032*	0.077*	0.007	0.035	0.004	0.006	0.162*	0.108*	0.208*	0.039*	0.051*	-0.081*	-0.083*	0.046*	1				
16. VC_SPEC	0.052*	0.026*	0.014	0.033*	0.003	0.020	0.029*	-0.018*	-0.021	0.031*	0.025*	-0.024	-0.026	0.023	0.026*	1			
17. AVG_VC_INV	0.087*	0.039*	0.037*	0.011*	0.034*	0.086*	0.036	-0.060*	-0.087*	0.064*	0.043*	0.001	-0.005*	0.050*	0.060*	0.212*	1		
18.VV_IPO_RATIO	0.035	-0.048*	0.041*	0.007	0.045*	-0.086*	-0.013	0.023	0.009	0.004	-0.058*	0.136*	0.095*	-0.135*	-0.056*	-0.039*	1		

\* p<0.05

### Appendix A3: Number of IPOs

This table reports the total number of IPOs for each province in a fiscal year.

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
An Hui	9	12	17	18	24	26	32	36	44	45	46	51	54	56	64	75	76	76	79
Bei Jing	11	25	32	43	55	63	69	75	81	81	89	101	105	121	157	184	207	225	254
Chong Qing	12	19	19	22	25	26	27	27	29	29	29	30	30	31	35	38	40	40	43
Fu Jian	23	31	33	36	40	41	45	47	50	50	54	57	63	65	81	90	96	100	107
Gan Su	6	9	10	11	15	16	17	17	19	19	19	21	22	23	24	26	26	26	27
Guang Dong	86	103	109	111	121	129	133	138	151	153	163	188	202	226	295	342	372	373	397
Guang Xi	5	8	10	12	17	19	19	21	22	22	22	25	25	26	27	29	30	30	32
Gui Zhou	4	7	8	9	10	14	14	14	18	19	19	19	19	19	21	21	22	22	22
Hai Nan	14	18	19	22	24	24	25	25	25	25	25	25	25	26	27	30	31	31	32
He Bei	10	16	20	24	26	27	30	32	35	36	36	38	38	39	48	52	53	53	55
He Nan	7	11	16	22	24	26	28	31	32	33	35	38	40	43	53	64	67	67	68
Hei Long Jiang	12	17	21	26	30	31	33	33	33	33	33	33	33	33	37	38	39	39	40
Hu Bei	20	31	38	44	52	55	56	57	62	62	62	64	64	67	74	82	84	84	86
Hu Nan	11	18	20	27	32	34	36	39	45	45	47	50	52	56	65	73	78	78	81
Ji Lin	18	23	25	28	30	32	33	36	36	36	36	37	38	38	42	44	45	45	47
Jiang Su	22	35	38	46	55	61	67	80	86	89	99	111	119	128	168	214	236	236	254
Jiang Xi	6	11	11	12	15	17	22	23	24	24	25	27	27	27	31	32	34	34	34
Liao Ning	23	39	45	46	54	56	58	58	58	58	59	61	64	65	72	76	81	81	85
Nei Meng Gu	6	10	12	13	18	19	19	19	20	21	21	22	22	22	23	25	27	27	27
Ning Xia	3	4	7	8	10	10	10	11	11	11	11	11	11	11	12	12	12	12	12
Qing Hai	5	7	7	7	7	9	9	9	9	9	9	10	10	10	10	11	11	11	11
Shan Dong	23	35	44	49	55	59	66	67	73	75	83	88	96	106	116	127	138	149	160
Shan Xi	4	9	13	13	17	18	19	22	23	23	26	26	26	26	28	31	31	31	31
Shan Xi	10	16	18	20	22	22	24	25	27	27	27	29	31	32	38	39	41	41	44
Shang Hai	104	112	119	122	125	128	131	134	138	138	141	150	153	159	174	194	203	203	209
Si Chuan	19	31	41	43	44	51	53	54	57	57	57	59	65	70	81	87	91	91	93
Tian Jin	7	11	12	14	15	20	22	23	23	23	23	27	27	28	34	35	36	36	40

Xi Zang	3	5	5	6	7	8	8	8	8	8	8	8	8	9	9	9	10	10	10
Xin Jiang	6	10	11	14	19	21	23	26	27	27	29	30	32	34	36	37	39	39	40
Yun Nan	6	9	12	15	18	18	18	19	22	22	24	27	28	28	30	30	30	30	31
Zhe Jiang	18	30	34	40	49	51	56	63	81	84	93	113	124	135	180	218	237	238	255

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Total	513	722	826	923	1055	1131	1202	1269	1369	1384	1450	1576	1653	1759	2092	2365	2523	2558	2706
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