

10-15-2019

## CHARACTERISTICS OF BOARD OF DIRECTORS AND PERFORMANCE OF GEM LISTED COMPANIES FROM THE PERSPECTIVE OF VENTURE CAPITAL PARTICIPATION

Yuan Yang  
*Zhejiang University - China*

Yi Pan  
*Zhejiang University - China*

Binkun Yang  
*Zhejiang University - China*

Wenli Huang  
*Zhejiang University - China, wlhuangmath@126.com*

Follow this and additional works at: <https://bulletin.bmeb-bi.org/bmeb>

---

### Recommended Citation

Yang, Yuan; Pan, Yi; Yang, Binkun; and Huang, Wenli (2019) "CHARACTERISTICS OF BOARD OF DIRECTORS AND PERFORMANCE OF GEM LISTED COMPANIES FROM THE PERSPECTIVE OF VENTURE CAPITAL PARTICIPATION," *Bulletin of Monetary Economics and Banking*: Vol. 22: No. 3, Article 5.  
DOI: <https://doi.org/10.21098/bemp.v22i3.1094>  
Available at: <https://bulletin.bmeb-bi.org/bmeb/vol22/iss3/5>

This Article is brought to you for free and open access by Bulletin of Monetary Economics and Banking. It has been accepted for inclusion in Bulletin of Monetary Economics and Banking by an authorized editor of Bulletin of Monetary Economics and Banking. For more information, please contact [bmebjournal@gmail.com](mailto:bmebjournal@gmail.com).

## CHARACTERISTICS OF BOARD OF DIRECTORS AND PERFORMANCE OF GEM-LISTED COMPANIES FROM THE PERSPECTIVE OF VENTURE CAPITAL PARTICIPATION

Yuan Yang\*, Yi Pan<sup>\*a</sup>, Bingkun Yang\*, Wenli Huang<sup>\*\*</sup>

\* China Academy of Financial Research, Zhejiang University of Finance and Economics, Hangzhou, China.

\* China Academy of Financial Research, Zhejiang University of Finance and Economics, Hangzhou, China. Email: wlhuangmath@126.com

<sup>a</sup> Corresponding Author. Email: 18368386103@163.com

### ABSTRACT

This paper uses a difference-in-difference model to study the impact of venture capital (VC) participation on board characteristics. Our sample includes companies listed on the growth enterprise market (GEM) on China's Shenzhen stock exchange over the period 2009 to 2014. Our measure of board characteristics is chief executive officer (CEO) duality, the scale of the board of directors, and the proportion of independent directors. Our empirical analysis reveals the following findings: the VC-backed GEM-listed companies are more inclined to choose the mode of CEO duality and contain a large board of directors and a high proportion of independent directors. These characteristics, we find, are conducive to improving company performance.

*Keywords:* Venture capital; Difference-in-differences model; Board characteristics; Company performance.

**JEL Classification:** G24.

#### *Article history:*

Received : July 1, 2019

Revised : August 23, 2019

Accepted : September 9, 2019

Available online : October 15, 2019

<https://doi.org/10.21098/bemp.v22i3.1094>

## I. INTRODUCTION

Venture Capital (VC) originated in the United States in the 1930s and has prevailed since the 1970s. It was not until the 1980s that China's VC industry began to develop. In 1985, the Central Committee of the Communist Party of China approved for the first time the supporting role of VC for high-tech enterprises in the public document "Decision on the Reform of Science and Technology System." The China New Technology Venture Capital Company was established in September of the same year, marking the official introduction of VC to China. In the first year after the launch of the Shenzhen Small and Medium-sized Enterprise Stock Market in 2004, seven companies supported by VC were successfully listed. In November 2008, the first government entrepreneurship guidance fund was officially launched. With the deepening of reform and opening up, many foreign VC institutions have entered the Chinese market.

Most VC institutions invest in high-tech enterprises, which often face problems such as a shortage of development funds at the early stage and are characterized by high risk and large investments. In 2009, the establishment of China's Growth Enterprise Market (GEM) pushed the development of high-tech industry to new heights, also creating a good environment for the growth of VC in China. Because high-tech enterprises have hidden risks in all aspects of development, traditional financial institutions such as banks are reluctant to provide them loans. In contrast, VC institutions are attracted by the high level of innovation and high-yield characteristics of startup enterprises and are therefore more likely to help these enterprises by becoming their partners and through other means. Although VC provides financial support for startups, it also injects new vitality and provides value-added services.

The rapid development of VC has caught the eye of scholars at home and abroad. The relation between VC and their invested companies has thus become a research hotspot. Foreign research on the relation between VC and corporate governance is relatively mature (Suchard, 2009), but the findings might not apply to China. Current research in China, however, has the following shortcomings. First, the research mainly focuses on the impact of VC participation on company performance and Initial Public Offering (IPO) underpricing, with most of the research addressing the corporate governance role of VC. Second, most of the research used cross-sectional data at the time of the company's IPO and did not compare the data between the periods before and after the exit of VC. Third, hardly any research has been conducted on the impact of VC participation on the characteristics of listed companies' board of directors.

Since its establishment in 2009, China's GEM has faced problems such as a high price-to-earnings ratio and imperfect information disclosure. Most of its listed companies are startups with high business risks. In these companies, the board of directors is important not only in terms of corporate governance, but also in terms of the company's performance and other aspects. Based on the analysis above, this paper studies how VC influences company performance by affecting the characteristics of the company's board. Specifically, this paper uses GEM-listed companies as the research object and annual data at the time of their IPOs ( $t$ , before VC institutions exit) and two to three years after the IPOs ( $t + 2$  and  $t + 3$ , after VC institutions exit). First it compares the impact of VC institutions on the

characteristics of the company's board of directors before and after exit, and then it explores in depth the impact of board characteristics on company performance.

## II. LITERATURE REVIEW AND HYPOTHESIS

### *A. VC and Board Characteristics*

#### *A1. Board Size*

The board of directors is the permanent body responsible for implementing the resolutions of shareholder meetings, and it is composed of directors elected by the shareholders. Board directors have the power to appoint and dismiss managers. Zahra and Pearce (1991) found that, in a startup, the larger the board of directors, the more effectively it can control the executives, and the interests of shareholders can be maintained. Generally, company management will find it difficult to compete with a large board of directors. As the size of the board increases, its authority to supervise managers' behavior will grow, and resolutions that are not conducive to shareholders' interests will be difficult to have approved by the board. A larger board is often able to attract more capable board members, with richer knowledge, bringing the board more resources and opportunities. For example, Fama and Jensen (1983) found that the professional management knowledge of a large board can promote the director performance. Because major decisions in a company are usually decided by voting, the larger the board of directors, the more effective the suppression of insider control.

Many scholars have found that VC institutions have an impact on the size and structure of corporate boards (Zhang and Liao, 2011; Zhao and Wen, 2015). After investing in a startup, VC institutions usually send professionals to the company to participate in its business management. These professionals are likely to enter the board of directors of the invested company, thereby gaining more voting rights while expanding the board's size. Accordingly, we predict that VC institutions will protect their own interests by encouraging the invested companies to establish a larger board of directors to limit the rights of corporate insiders. We thus propose the following hypothesis.

H1: VC participation will increase the size of the board of GEM-listed companies.

#### *A2. CEO Duality*

According to the theory of fiduciary responsibility, the management of a company is the fiduciary responsible for the company's assets. It intends to provide qualified managers and will not deliberately damage the company's interests. Therefore, CEO duality can provide the company better business management. From the perspective of the company's long-term development, if its managers and owners are not the same people, this can reduce business efficiency or create competition between the board chairperson and the general manager.

In environmental dependence theory, which synthesizes environmental factors, environmental changes have an important impact on a company's board structure. If the environment in which the listed company grows changes greatly and is full of uncertainty, the company's CEO duality structure will improve

decision making efficiency, and its benefits will be greater than the agency costs. If, however, the company's environment is stable, given the agency problem, the separation of ownership and management could benefit the company's development.

In modern management theory, the structure of CEO duality can reduce agency costs, whereas the separation of board of directors and general manager can cause conflicts of interest between the board and the general manager, reducing the efficiency of the company and increasing agency costs. Based on principal-agent theory, people are rational, self-interested opportunists. Every individual will chase after greater benefits, which can result in adverse selection and moral risk. Therefore, CEO duality could provide an opportunity for the manager who is also a board member to damage the interests of shareholders.

Because of the imperfect mechanisms of China's relatively young GEM, the environment of high-tech listed enterprises is rapidly changing. Accordingly, we assume that the structure of CEO duality can improve decision making and operational efficiency, enhance the innovation autonomy of enterprises, and reduce VC institutions' investment risks by providing a more comprehensive understanding of enterprises. This paper thus proposes the following hypothesis.

H2: VC-backed GEM-listed companies are more inclined to choose the CEO duality structure.

### *A3. Proportion of Independent Directors*

The proportion of independent directors, calculated by the ratio of the number of independent directors of the company to the total number of board members, is a measurement of the independence of the board of directors. Independent directors are employed externally, independent of shareholders and managers. Their main role is to supervise the company's executives and prevent them from harming its interests. Generally, independent directors are professionals in different industries, so that they can properly monitor management's operations and provide good advice with their professional knowledge. Many scholars believe that VC-backed companies have a more independent board structure (Baker and Gompers, 2003; Suchard, 2009). After investing in a company, VC institutions often send experts to the company to provide professional consulting services to reduce the risk of principal-agent problems caused by information asymmetry. VC institutions also have incentives to seek more professional independent directors for the invested enterprises. This paper thus speculates that VC participation increases the proportion of independent directors on the boards of GEM-listed companies. We therefore propose the following hypothesis.

H3: VC participation increases the proportion of independent directors on the boards of GEM-listed companies.

## *B. Board Characteristics and Company Performance*

### *B1. Board Size*

The research on the impact of board size on company performance has produced mixed conclusions: some find that the board's size is positively correlated with

company performance (Geoffrey and Gavin, 2003; Li, 2015), whereas others find that it is negatively correlated with company performance (Lipton and Lorsch, 1992; Wang, 2012). For who support the first conclusion, the larger the board of directors, the greater the control and the richer the resources, all of which are conducive to improving company performance; for those who support the second conclusion, a larger board will lead to more serious agency problems and increase agency costs and thus reduce company performance. This paper argues that, for the GEM companies, the impact of board size on firm performance is uncertain. We therefore propose the following two hypotheses.

H4a: The larger the board of directors, the better the company's performance.

H4b: The larger the board of directors, the worse the company's performance.

### *B2. CEO Duality*

There are also two different opinions about the impact of CEO duality on company performance. Some believe that CEO duality is conducive to improving company performance (Manigart, 2002; Han, 2015), because this structure reduces the cost of communications between the board chairperson and the general manager, and thus reduces information asymmetry, which can improve company performance. Others find that CEO duality will not benefit company performance (Liu and Chang, 2009), because the chairperson will lose independence under such structure, and the chairperson could hurt the company's interests. This paper therefore proposes the following hypotheses.

H5a: The CEO duality structure helps improve company performance.

H5b: The CEO duality structure does not improve company performance.

### *B3. Proportion of Independent Directors*

Most of the research finds a positive correlation between the proportion of independent directors and company performance (Liu, 2011; Xie, 2011; Zhang, 2012). The minority who find the opposite find that independent directors could fail to play their role and thus do not improve company performance. To explore which conclusion holds among China's GEM companies, this paper proposes the following hypotheses.

H6a: The proportion of independent directors on the board is positively correlated with company performance.

H6b: The proportion of independent directors on the board is negatively correlated with company performance.

## **III. RESEARCH DESIGN**

### *A. Samples and Data*

This paper selects companies that were listed on China's GEM from October 30, 2009, when the GEM was officially launched, to December 31, 2014 (to cover three years after IPOs). Because of the suspension of the GEM in 2013, there are no data for that year. To ensure the objectiveness of our results, we refer to the "Guidelines for the Classification of Listed Companies" promulgated by the China Securities



Regulatory Commission for industry standards. Our samples were processed as follows: we excluded 1) all ST companies and companies with incomplete data and 2) companies with abnormal data. The financial data and data on board characteristics are from the China Stock Market & Accounting Research database<sup>1</sup> and the Wind database.<sup>2</sup> Wu's (2012) method is used to determine VC participation.

The final sample comprises 388 companies listed on the GEM, with 1,164 observations, covering annual data in the IPO year ( $t$ ) and two and three years after the IPO ( $t + 2$ ,  $t + 3$ ). Among these companies, 221 (59.95%) have VC participation, and 167 (43.04%) have no VC participation.

## B. Variable Definition

### B1. VC and Board Characteristics

(1) Explained Variables. The structure of CEO duality is represented by the dummy variable *dual*. When a company chooses the CEO duality structure, *dual* equals one, and zero otherwise. The size of the board of directors (*bsize*) refers to the number of board members, and the proportion of independent directors (*outdire*) refers to the ratio of the number of independent directors to the total number of board directors of the company.

(2) Explanatory Variables. The explanatory variables of this paper are the dummy variable *vc\*exit\_before* and the characteristic variables of the VC institution. The variable *vc\*exit\_before* is determined by the presence ( $VC = 1$ ) or absence ( $VC = 0$ ) of VC participation, and whether the VC exits (if it does, *exit\_before* = 0, and otherwise *exit\_before* = 1). If *vc\*exit\_before* equals one, this means that the VC institution has not withdrawn from the invested company; that is, there is VC participation; when *vc\*exit\_before* equals zero, the VC institution has exited.

(3) Control Variables. This paper uses the company's growth, financial leverage, size, and performance as control variables. The variable for company growth (*Growth*) is measured by Tobin's Q, financial leverage (*Lev*) is measured by the asset-to-liability ratio, company size (*Size*) is measured as the natural logarithm of the company's total assets, and company performance (*ROE*) is measured by the company's return on equity. To control for industry and year effects, respectively, the industry dummy variable (*IND*) and the year dummy variable (*YR*) are also added to the model.

### B2. Board Characteristics and Company Performance

(1) Explained Variables. This paper uses the return on equity (*ROE*) to represent the performance of GEM-companies.

(2) Explanatory Variables. We include as explanatory variables the dummy variable for CEO duality (*dual*), board size (*bsize*), and the independent director ratio (*outdire*).

(3) Control Variables. We include as control variables company growth (*growth*), financial leverage (*lev*), company size (*size*), an industry dummy variable (*IND*), and a year dummy variable (*YR*).

<sup>1</sup> See <http://us.gtadata.com/>.

<sup>2</sup> See <https://www.wind.com.cn/>.

## C. Model Design

## C1. VC and Board Characteristics

This paper uses a difference-in-differences (DID) model to analyze the impact of VC on the characteristics of the board of directors. We categorize companies with VC participation as the experimental group, and companies without VC participation as the control group. The basic form of the traditional DID model is;

$$y_{it} = \alpha + \beta_1 vc_i * exit\_before_i + \beta_1 vc_i + \beta_2 exit\_before_i + \varepsilon_{it} \quad (1)$$

where *vc* indicates whether it is in the experimental group, and *exit\_before* indicates whether the VC exits.

The traditional model is only applicable in the case in which, for each company *i*, the VC institutions exit at the same time. However, obviously, VC might not exit at the same time point. Some companies that belong to the control group in period *t* will be in the experimental group in period *t* + 1. To resolve this issue, this paper uses the continuous time DID model. According to H1 to H3, the model is as follows.

$$dual_{i,t} = \alpha + \beta_1 vc_{i,t} * exit\_before_{i,t} + \beta_2 growth_{i,t} + \beta_3 lev_{i,t} + \beta_4 size_{i,t} + \beta_5 roe_{i,t} + IND_t + YR_t + \varepsilon_{i,t}, \quad (2)$$

$$bsize_{i,t} = \alpha + \beta_1 vc_{i,t} * exit\_before_{i,t} + \beta_2 growth_{i,t} + \beta_3 lev_{i,t} + \beta_4 size_{i,t} + \beta_5 roe_{i,t} + IND_t + YR_t + \varepsilon_{i,t}, \quad (3)$$

$$outdire_{i,t} = \alpha + \beta_1 vc_{i,t} * exit\_before_{i,t} + \beta_2 growth_{i,t} + \beta_3 lev_{i,t} + \beta_4 size_{i,t} + \beta_5 roe_{i,t} + IND_t + YR_t + \varepsilon_{i,t}, \quad (4)$$

where *exit\_before* is a dummy variable that measures whether the VC exits, where *exit\_before* = 1 indicates observations of a VC-backed company before the VC exits and *exit\_before* = 0 indicates observations after the VC exits. The term *vc\*exit\_before* is the cross-term between *vc* and *exit\_before*, where a value of one indicates observations before the VC exits, and a value of zero indicates observations with no VC participation or after the VC institution exits. The terms *IND* and *YR* are industry and year fixed effects, respectively.

## C2. Board Characteristics and Company Performance

According to H4 to H6, the following model is proposed:

$$ROE_{i,t} = \beta_0 + \beta_1 bsize_{i,t} + \beta_2 growth_{i,t} + \beta_3 lev_{i,t} + \beta_4 size_{i,t} + IND_t + YR_t + \varepsilon_{i,t}, \quad (5)$$

$$ROE_{i,t} = \beta_0 + \beta_1 dual_{i,t} + \beta_2 growth_{i,t} + \beta_3 lev_{i,t} + \beta_4 size_{i,t} + IND_t + YR_t + \varepsilon_{i,t}, \quad (6)$$

$$ROE_{i,t} = \beta_0 + \beta_1 outdire_{i,t} + \beta_2 growth_{i,t} + \beta_3 lev_{i,t} + \beta_4 size_{i,t} + IND_t + YR_t + \varepsilon_{i,t}, \quad (7)$$



where company performance (ROE) is the explanatory variable, the board characteristics (*dual*, *bsize*, *outdire*) are explanatory variables, and the company characteristics are control variables.

#### D. Descriptive Statistics

Table 1 lists the names and definitions of variables used in this paper. Table 2 shows the descriptive statistics of the main variables of all the samples. There are 1,164 observations, with 388 GEM-listed companies' annual data for periods  $t$ ,  $t + 2$ , and  $t + 3$  from 2009 to 2014. The average size of the board of directors for all the observations is about eight people, and the average ratio of independent directors is 0.3784.

**Table 1.**  
**Variable Definition**

In this table, all variables appearing in this paper are defined and explained.

Description	Variable	Variable Name	Definition
<b>Panel A: VC and Board Characteristics</b>			
<b>Explained Variables</b>	CEO Duality	<i>dual</i>	dummy variable, <i>dual</i> = 1 if the company chooses the CEO duality structure, otherwise <i>dual</i> = 0
	Board Size	<i>bsize</i>	the number of board members
	Proportion of Independent Directors	<i>outdire</i>	the number of independent directors / the total number of board directors of a company
<b>Explanatory Variables</b>	Cross-term	<i>vc*exit_before</i>	dummy variable, determined by whether there is VC participation and whether the VC exit, <i>vc*exit_before</i> = 1 if the VC institution has not exited from the VC-backed company; otherwise <i>vc*exit_before</i> = 0
<b>Control Variables</b>	Company's Growth	<i>growth</i>	Tobin Q value
	Financial Leverage	<i>lev</i>	asset-liability ratio = total assets / total liabilities
	Company Performance	<i>ROE</i>	net profit of the year / total equity at the end of the year
	Company Size	<i>size</i>	the natural logarithm of the company's total assets
	Year Dummy Variable	<i>YR</i>	dummy variable, controlling the year effect, set according to the years of different companies' IPO
	Industry Dummy Variable	<i>IND</i>	dummy variable, controlling the industry effect, set according to the industry code of the "Industry Classification Guide for Listed Companies" published by the Shenzhen Stock Exchange, a total of 13 codes are used in this paper

Table 1.  
Variable Definition (Continued)

Description	Variable	Variable Name	Definition
Panel B: Board Characteristics and Company Performance			
Explained Variables	Company Performance	ROE	net profit of the year / total equity at the end of the year
Explanatory Variables	CEO Duality	dual	dummy variable, dual = 1 if the company chooses the CEO duality structure, otherwise dual = 0
	Board Size	bsize	the number of board members
	Proportion of Independent Directors	outdire	the number of independent directors / the total number of board directors of a company
	Company's Growth	growth	Tobin Q value
	Financial Leverage	lev	asset-liability ratio = total assets / total liabilities
	Company Size	size	the natural logarithm of the company's total assets
Control Variables	Year Dummy Variable	YR	dummy variable, controlling the year effect, set according to the years of different companies' IPO
	Industry Dummy Variable	IND	dummy variable, controlling the industry effect, set according to the industry code of the "Industry Classification Guide for Listed Companies" published by the Shenzhen Stock Exchange, a total of 13 codes are used in this paper

Table 2.  
Descriptive Statistics of All Samples

This table has descriptive statistics of the data for the entire sample. Each variable noted in column 1 is explained in Table 1.

Variables	Obs.	Mean	Std. Dev.	Min.	Max.
Dual	1164	0.4898	0.5001	0.0000	1.0000
Bsize	1164	8.1946	1.3604	4.0000	14.0000
Outdire	1164	0.3784	0.0588	0.1818	0.8333
ROE	1164	0.0999	0.0530	-0.0901	0.3423
Lev	1164	0.2054	0.1377	0.0110	0.7695
Size	1164	20.7065	0.5486	19.4910	23.8933
Growth	1164	4.7549	3.4363	1.0876	29.5610

Tables 3 and 4 show the descriptive statistics of the samples with and without VC participation, respectively. In Table 3, the average board size of enterprises with VC participation is 8.3251 members, with an average ratio of independent directors of 0.3890, whereas the figures for companies without VC participation (Table 4) are 7.99 members and 0.3748, respectively. Comparing Tables 3 and 4,

we find that, in companies with VC participation, the board size is larger, and the proportion of independent directors is higher.

**Table 3.**  
**Descriptive Statistics of Samples of VC-backed Companies**

This table has descriptive statistics of the data for the sample of VC-backed companies. Each variable noted in column 1 is explained in Table 1.

<b>Variables</b>	<b>Obs.</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min.</b>	<b>Max.</b>
<i>Dual</i>	663	0.5169	0.5001	0.0000	1.0000
<i>Bsize</i>	663	8.3251	1.3278	4.0000	14.0000
<i>Outdire</i>	663	0.3890	0.0827	0.0000	0.8333
<i>ROE</i>	663	0.0971	0.0531	-0.0901	0.3423
<i>Lev</i>	663	0.2170	0.1430	0.0158	0.7695
<i>Size</i>	663	20.7617	0.5333	19.4910	22.5661
<i>Growth</i>	663	4.9940	3.7460	1.0876	29.5610

**Table 4.**  
**Descriptive Statistics of Samples of Non-VC-backed Companies**

This table has descriptive statistics of the data for the sample of non-VC-backed companies. Each variable noted in column 1 is explained in Table 1.

<b>Variables</b>	<b>Obs.</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min.</b>	<b>Max.</b>
<i>Dual</i>	501	0.4488	0.4980	0.0000	1.0000
<i>Bsize</i>	501	7.9977	1.3867	4.0000	12.0000
<i>Outdire</i>	501	0.3748	0.0653	0.1818	0.6000
<i>ROE</i>	501	0.1042	0.0525	-0.0735	0.3060
<i>Lev</i>	501	0.1879	0.1879	0.0110	0.6951
<i>Size</i>	501	20.6228	0.5615	19.5314	23.8933
<i>Growth</i>	501	4.3924	2.8707	1.3354	18.4001

#### IV. EMPIRICAL RESULTS AND ANALYSIS

##### A. VC and Board Characteristics

##### A1. Experimental and Control Groups in the Absence of VC Participation

When choosing an investment target, VC institutions prefer companies with a better governance structure and higher performance. Therefore, endogenous problems can arise during the research process, such as VC-backed and non-VC-backed companies having systematic differences before VC participation. Because the data on board characteristics before listing cannot be obtained, this paper uses the period two and three years after the IPO to represent the exit time of VC, to explore the board characteristics of VC-backed companies after VC exits. By doing so, we can rule out potential differences in board characteristics between non-VC-backed companies and VC-backed companies after VC exits. The regression results in Tables 5 to 7 show that, in a stepwise regression process, the coefficients of *vc* are small and nonsignificant, indicating little difference between the two groups of companies.

**Table 5.**  
**CEO duality after VC Exits**

This table reports results of CEO duality and VC exists. The statistics in () is the *t*-statistic. Column (1) shows the regression results without control variables, and columns (2)-(5) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	<i>Dual</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Vc</i>	0.0395 (0.0913)	0.0395 (0.0913)	0.0707 (0.0931)	0.0673 (0.0933)	0.0664 (0.0933)
<i>Lev</i>		-0.00611 (0.289)	0.234 (0.321)	0.282 (0.323)	0.306 (0.326)
<i>Size</i>			-0.142** (0.0815)	-0.143** (0.0816)	-0.143** (0.0817)
<i>Growth</i>				0.0269** (0.0143)	0.0286** (0.0146)
<i>ROE</i>					0.0505 (0.0960)
Constant	-0.173** (0.0690)	-0.172* (0.102)	2.730 (1.671)	2.636 (1.675)	2.622 (1.676)
<i>IND</i>	controlled	controlled	controlled	controlled	controlled
<i>YR</i>	controlled	controlled	controlled	controlled	controlled
Observations	775	775	775	775	775
Sample Size	388	388	388	388	388

**Table 6.**  
**Board Size after VC Exits**

This table reports results of board size and VC exists. The statistics in () is the *t*-statistic. Column (1) shows the regression results without control variables, and columns (2)-(5) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	<i>Bsize</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Vc</i>	0.149 (0.128)	0.101 (0.128)	0.0978 (0.127)	0.0929 (0.127)	0.0752 (0.127)
<i>Size</i>		0.219*** (0.0778)	0.247*** (0.0786)	0.255*** (0.0788)	0.326*** (0.0858)
<i>Growth</i>			-0.0254** (0.0117)	-0.0231* (0.0119)	-0.0246** (0.0119)
<i>ROE</i>				0.0678 (0.0517)	0.0491 (0.0521)
<i>Lev</i>					-0.749** (0.355)
Constant	8.047*** (0.0973)	3.468** (1.630)	2.982* (1.640)	2.802* (1.645)	1.503 (1.755)
<i>IND</i>	controlled	controlled	controlled	controlled	controlled
<i>YR</i>	controlled	controlled	controlled	controlled	controlled
Observations	776	776	776	776	776
Sample Size	388	388	388	388	388

**Table 7.**  
**Proportion of Independent Directors after VC Exits**

This table reports results of proportion of independent directors after VC exists. The statistics in () is the *t*-statistic. Column (1) shows the regression results without control variables, and columns (2)-(5) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	<i>Outdire</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Vc</i>	0.0026 (0.0057)	0.0041 (0.0058)	0.0050 (0.0058)	0.0052 (0.0058)	0.0051 (0.0058)
<i>Size</i>		-0.0062* (0.0037)	-0.00970** (0.0040)	-0.0098** (0.0040)	-0.0102** (0.0041)
<i>Lev</i>			0.0343** (0.0165)	0.0315* (0.0167)	0.0321* (0.0167)
<i>ROE</i>				-0.0031 (0.0026)	-0.0028 (0.0026)
<i>Growth</i>					0.0004 (0.0005)
Constant	0.375*** (0.0043)	0.504*** (0.0785)	0.568*** (0.0841)	0.572*** (0.0842)	0.578*** (0.0847)
<i>IND</i>	controlled	controlled	controlled	controlled	controlled
<i>YR</i>	controlled	controlled	controlled	controlled	controlled
Observations	776	776	776	776	776
Sample Size	388	388	388	388	388

#### *A2. Randomness of VCs Choosing Target Companies*

This paper uses probit regression in a binary selection model to determine the relation between VC screening factors and board characteristics. The regression results are shown in Tables 8 to 10. The coefficient of board characteristics is not significant, indicating no obvious influence of board characteristics on VCs' selection of target companies.

**Table 8.**  
**Relationship between VC's Screening Factors and CEO Duality**

This table reports results of the relation between VC's screening factors and CEO duality. The statistics in () is the *t*-statistic. Column (1) shows the regression results without control variables, and columns (2)-(5) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	Vc				
	(1)	(2)	(3)	(4)	(5)
Dual	0.0395 (0.0912)	0.0616 (0.0921)	0.0680 (0.0924)	0.0673 (0.0924)	0.0670 (0.0924)
Size		0.359*** (0.0747)	0.456*** (0.0833)	0.456*** (0.0834)	0.455*** (0.0834)
Lev			-0.888*** (0.326)	-0.879*** (0.327)	-0.859*** (0.331)
Growth				0.00481 (0.0146)	0.00615 (0.0149)
ROE					0.0413 (0.0982)
Constant	0.157*** (0.0604)	-7.398*** (1.574)	-9.206*** (1.720)	-9.228*** (1.722)	-9.238*** (1.722)
IND	controlled	controlled	controlled	controlled	controlled
YR	controlled	controlled	controlled	controlled	controlled
Observations	755	755	775	775	775

**Table 9.**  
**Relationship between VC's Screening Factors and Board Size**

This table reports results of the relation between VC's screening factors and board size. The statistics in () is the *t*-statistic. Column (1) shows the regression results without control variables, and columns (2)-(5) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	Vc				
	(1)	(2)	(3)	(4)	(5)
Bsize	0.0475 (0.0349)	0.0199 (0.0357)	0.0151 (0.0358)	0.0165 (0.0360)	0.0161 (0.0360)
Size		0.353*** (0.0755)	0.450*** (0.0842)	0.449*** (0.0842)	0.449*** (0.0842)
Lev			-0.874*** (0.326)	-0.864*** (0.328)	-0.845** (0.331)
Growth				0.00556 (0.0146)	0.00682 (0.0149)
ROE					0.0398 (0.0982)
Constant	-0.208 (0.285)	-7.409*** (1.566)	-9.180*** (1.710)	-9.208*** (1.713)	-9.218*** (1.713)
IND	controlled	controlled	controlled	controlled	controlled
YR	controlled	controlled	controlled	controlled	controlled
Observations	776	776	776	776	776

**Table 10.**  
**Relationship between VC's Screening Factors and Proportion of Independent Directors**

This table reports results of the relation between VC's screening factors and proportion of independent directors. The statistics in () is the *t*-statistic. Column (1) shows the regression results without control variables, and columns (2)-(5) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	VC				
	(1)	(2)	(3)	(4)	(5)
<i>Outdire</i>	0.203 (0.742)	0.215 (0.746)	0.191 (0.750)	0.193 (0.750)	0.193 (0.750)
<i>Size</i>	0.361*** (0.0745)	0.457*** (0.0830)	0.457*** (0.0831)	0.456*** (0.0831)	0.456*** (0.0831)
<i>Lev</i>		-0.881*** (0.326)	-0.873*** (0.327)	-0.853*** (0.330)	-0.853*** (0.330)
<i>Growth</i>			0.00447 (0.0146)	0.00579 (0.0149)	0.00579 (0.0149)
<i>ROE</i>				0.0412 (0.0983)	0.0412 (0.0983)
Constant	-7.483*** (1.599)	-9.276*** (1.742)	-9.344*** (1.742)	-9.299*** (1.743)	-9.299*** (1.743)
<i>IND</i>	controlled	controlled	controlled	controlled	controlled
<i>YR</i>	controlled	controlled	controlled	controlled	controlled
Observations	776	776	776	776	776

### A3. VC and Board Characteristics

Table 11 shows the empirical results of Model 1. It can be seen that the coefficient of *vc\*exit\_before* is always positive at the 1% level of significance, even after all the control variables are added, indicating that, compared with non-VC-backed companies, VC-backed companies are more inclined to choose the mode of CEO duality, and verifying H1. The possible reasons for choosing CEO duality are as follows: CEO duality can reduce information asymmetry between company owners and managers, improve the efficiency of decision making, and help optimize the corporate governance structure.



**Table 11.**  
**The Impact of VC on Board Characteristics (Model 1, CEO Duality)**

This table reports results of the impact of VC on board characteristics (CEO duality). The statistics in () is the *t*-statistic. Column (1) shows the regression results without control variables, and columns (2)-(5) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	Dual				
	(1)	(2)	(3)	(4)	(5)
<i>Vc*exit_before</i>	0.751*** (2.95)	0.778*** (3.01)	1.495*** (2.70)	1.175*** (3.21)	1.152*** (3.13)
<i>Growth</i>		-0.113* (-1.66)	-0.151** (-2.15)	-0.150** (-2.10)	-0.161** (-2.20)
<i>Size</i>			1.103** (2.46)	1.364*** (2.78)	1.370*** (2.77)
<i>Lev</i>				-3.381* (-1.80)	-3.538* (-1.88)
<i>ROE</i>					-0.208 (-0.73)
<i>IND</i>	controlled	controlled	controlled	controlled	controlled
<i>YR</i>	controlled	controlled	controlled	controlled	controlled

Table 12 illustrates the empirical results of Model 2, where the coefficient of *vc\*exit\_before* is also significantly positive. The results verify H2, that is, companies with VC participation have a larger board of directors. This could be due to the fact that VC institutions always send professionals to the invested company's board of directors to participate in the company's operations and management.

**Table 12.**  
**The Impact of VC on Board Characteristics (Model 2, Board Size)**

This table reports results of the impact of VC on board characteristics (board size). The statistics in () is the *t*-statistic. Column (1) shows the regression results without control variables, and columns (2)-(5) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	bsize				
	(1)	(2)	(3)	(4)	(5)
<i>Vc*exit_before</i>	0.207***# (4.12)	0.206*** (4.20)	0.214*** (5.02)	0.213*** (4.94)	0.203*** (4.76)
<i>Growth</i>		0.0153 (0.47)	0.0132 (0.41)	0.0124 (0.40)	0.0126 (0.41)
<i>Size</i>			0.317*** (4.72)	0.403*** (5.93)	0.406*** (5.88)
<i>Lev</i>				-0.701*** (-3.73)	-0.711*** (-3.76)
<i>ROE</i>					-0.0587* (-2.10)
<i>IND</i>	controlled	controlled	controlled	controlled	controlled
<i>YR</i>	controlled	controlled	controlled	controlled	controlled

Table 13 shows the empirical results of Model 3. The coefficient of *vc\*exit\_before* is significantly positive at the 5% level, indicating that VC participation is always accompanied by a higher proportion of independent directors on the invested company's board, and verifying H3. The previous analysis (in Section II A3) has shown that independent directors supervise corporate executives to prevent them from harming the company's interests. After VC invests in the company, to reduce the risk of principal-agent problems caused by information asymmetry, experts are often assigned to provide professional advice, and there is also incentive to seek more capable independent directors, thus increasing the proportion of independent directors of the company.

**Table 13.**  
**The Impact of VC on Board Characteristics**  
**(Model 3, Proportion of Independent Directors)**

This table reports results of the impact of VC on board characteristics (proportion of independent directors). The statistics in () is the *t*-statistic. Column (1) shows the regression results without control variables, and columns (2)-(5) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	<i>outdire</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Vc*exit_before</i>	0.0031** (2.65)	0.0031** (2.75)	0.0030** (2.34)	0.0030** (2.66)	0.0034** (2.92)
<i>Growth</i>		-0.0011** (-2.92)	-0.0010** (-2.81)	-0.0010*** (-3.74)	-0.0010*** (-3.75)
<i>Size</i>			-0.0076*** (-4.04)	-0.0133*** (-5.47)	-0.0135*** (-5.51)
<i>Lev</i>				0.0469*** (4.35)	0.0473*** (4.38)
<i>ROE</i>					0.0023 (0.80)
<i>IND</i>	controlled	controlled	controlled	controlled	controlled
<i>YR</i>	controlled	controlled	controlled	controlled	controlled

#### *B. Board Characteristics and Company Performance*

Table 14 shows the regression results for company performance and the CEO duality structure. The coefficient of *dual* is significantly positive at the 1% level, indicating that CEO duality is beneficial to company performance, supporting H5a.

**Table 14.**  
**Relationship between Company Performance and CEO Duality**

This table reports results of relation between company performance and CEO duality. The statistics in () is the *t*-statistic. Column (1) shows the regression results without control variables, and columns (2)-(5) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	ROE			
	(1)	(2)	(3)	(4)
<i>Dual</i>	0.102*** (0.0104)	0.102*** (0.0099)	0.101*** (0.0099)	0.100*** (0.0098)
<i>Size</i>		0.0384*** (0.0113)	0.0570** (0.0254)	0.0564** (0.0243)
<i>Lev</i>			-0.153 (0.111)	-0.152 (0.108)
<i>Growth</i>				0.0012 (0.0024)
<i>IND</i>	controlled	controlled	controlled	controlled
<i>YR</i>	controlled	controlled	controlled	controlled
Constant	0.0652 (0.0448)	-0.715** (0.262)	-1.078* (0.535)	-1.073* (0.524)
Observations	1,163	1,163	1,163	1,163
Sample Size	388	388	388	388
R-squared	0.651	0.652	0.652	0.652

Table 15 shows the regression results for company performance and board size. The variable *bsize* is also positively correlated with *ROE* at the 1% level, indicating that the larger the board size, the higher the company's performance, and H4a is verified. This paper concludes that a company with a large board of directors can have more resources and opportunities, which have a positive effect on the company's performance.

Table 16 shows the regression results for company performance and the proportion of independent directors. The coefficient of *outdire* is positive at the 1% significance level, indicating that the higher the proportion of independent directors, the better the company's performance. Thus, H6a is verified. Many of the company's independent directors are celebrities or scholars of high prestige or professional knowledge in a certain field. Not only can they bring different resources to the company, but also they can provide consulting services and thus make a positive contribution to the company's performance.

**Table 15.**  
**Relationship between Company Performance and Board Size**

This table reports results of the relationship between company performance and board size. The statistics in () is the *t*-statistic. Column (1) shows the regression results without control variables, and columns (2)–(5) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	ROE			
	(1)	(2)	(3)	(4)
<i>Bsize</i>	0.0529*** (0.0096)	0.0522*** (0.0096)	0.0514*** (0.0101)	0.0512*** (0.0105)
<i>Size</i>		0.0220* (0.0117)	0.0362* (0.0199)	0.0358* (0.0193)
<i>Lev</i>			-0.115 (0.0937)	-0.115 (0.0916)
<i>Growth</i>				0.0011 (0.0025)
Constant	-0.298*** (0.0950)	-0.738** (0.264)	-1.011** (0.378)	-1.009** (0.374)
<i>IND</i>	controlled	controlled	controlled	controlled
<i>TR</i>	controlled	controlled	controlled	controlled
Observations	1,164	1,164	1,164	1,164
Sample Size	388	388	388	388
<i>R</i> -squared	0.655	0.655	0.655	0.655

**Table 16.**  
**Relation between Company Performance and the Proportion of Independent Directors**

This table reports results of the relation between company performance and the proportion of independent directors. The statistics in () is the *t*-statistic. Column (1) shows the regression results without control variables, and columns (2)–(4) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	ROE			
	(1)	(2)	(3)	(4)
<i>Outdire</i>	0.729*** (0.173)	0.741*** (0.177)	0.760*** (0.158)	0.774*** (0.146)
<i>Size</i>		0.0457*** (0.00941)	0.0709*** (0.0197)	0.0691*** (0.0177)

Table 16.  
Relation between Company Performance and the Proportion of  
Independent Directors (Continued)

Variables	ROE			
	(1)	(2)	(3)	(4)
<i>Lev</i>			-0.205* (0.113)	-0.203* (0.107)
<i>Growth</i>				0.00436 (0.00483)
<i>IND</i>	controlled	controlled	controlled	controlled
<i>TR</i>	controlled	controlled	controlled	controlled
Observations	1,164	1,164	1,164	1,164
Sample size	388	388	388	388
R-Squared	0.652	0.653	0.654	0.654

C. Robustness Tests

C1. Fictional Treatment Group

In the previous analysis, *t* refers to the year a company goes public, with VC still participating in the company's operations, whereas years *t* + 2 and *t* + 3 refer to two and three years, respectively, after the IPO, when VC has exited. The empirical results above show that VC participation has a significant impact on board characteristics. To test the robustness of this conclusion, this paper further sets *t* + 2 as the year in which a company still has VC participation, that is, years *t* and *t* + 2 are VC participation years, and year *t* + 3 is the VC exit year.

The regression results are shown in Tables 17 to 19. When we set years *t* and *t* + 2 as having VC participation, and year *t* + 3 as the year VC exits, the coefficient of *vc\*exit\_before* is no longer significant. This means that the original empirical results are stable.

Table 17.  
VC and CEO Duality (*t*+2 as the years with VC participation)

This table reports results of the VC and CEO duality (*t*+2 as the years with VC participation). The statistics in () is the *t*-statistic. Column (1) shows the regression results without control variables, and columns (2)-(4) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	<i>dual</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Vc*exit_before</i>	0.0283 (0.0202)	0.0281 (0.0226)	0.0305 (0.0253)	0.0310 (0.0251)	0.0390 (0.0209)
<i>Growth</i>		0.0153*** (0.0047)	0.0148** (0.0048)	0.0149** (0.0049)	0.0140** (0.0057)

**Table 17.**  
**VC and CEO Duality ( $t+2$  as the years with VC participation) (Continued)**

Variables	<i>dual</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Lev</i>			0.260 (0.147)	0.260 (0.148)	0.229** (0.0979)
<i>ROE</i>				-0.0035 (0.0221)	0.0095 (0.0174)
<i>Size</i>					-0.104** (0.0369)
<i>IND</i>	controlled	controlled	controlled	controlled	controlled
<i>YR</i>	controlled	controlled	controlled	controlled	controlled
Observations	1,163	1,163	1,163	1,163	1,163
Sample Size	388	388	388	388	388
R-squared	0.046	0.055	0.061	0.061	0.105

**Table 18.**  
**VC and Board Size ( $t+2$  as the years with VC participation)**

This table reports results of the relation between VC and board size ( $t+2$  as the years with VC participation). The statistics in () is the  $t$ -statistic. Column (1) shows the regression results without control variables, and columns (2)-(4) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	<i>bsize</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Vc*exit_before</i>	-0.0348 (0.0428)	-0.0308 (0.0484)	-0.0317 (0.0451)	-0.0165 (0.0470)	-0.0155 (0.0470)
<i>Size</i>		0.314*** (0.0686)	0.399*** (0.0754)	0.406*** (0.0772)	0.400*** (0.0690)
<i>Lev</i>			-0.703*** (0.184)	-0.720*** (0.185)	-0.709*** (0.193)
<i>ROE</i>				-0.106*** (0.0327)	-0.108*** (0.0333)
<i>Growth</i>					0.0134 (0.0308)
<i>IND</i>	controlled	controlled	controlled	controlled	controlled
<i>YR</i>	controlled	controlled	controlled	controlled	controlled
Observations	1,163	1,163	1,163	1,163	1,163
Sample Size	388	388	388	388	388
R-squared	0.056	0.067	0.072	0.073	0.074

**Table 19.**  
**VC and Proportion of Independent Directors**  
**(*t*+2 as the years with VC participation)**

This table reports results of the VC and proportion of independent directors (*t*+2 as the years with VC participation). The statistics in () is the *t*-statistic. Column (1) shows the regression results without control variables, and columns (2)-(4) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	Outdire				
	(1)	(2)	(3)	(4)	(5)
<i>Vc*exit_before</i>	-0.0002 (0.0024)	-0.0003 (0.0026)	-0.0003 (0.0027)	-0.0003 (0.0025)	-0.0005 (0.0029)
<i>Size</i>		-0.0082*** (0.0018)	-0.0077*** (0.0018)	-0.0135*** (0.0023)	-0.0136*** (0.0022)
<i>Growth</i>			-0.0010** (0.0003)	-0.0010*** (0.0002)	-0.0010*** (0.0002)
<i>Lev</i>				0.0467*** (0.0108)	0.0470*** (0.0107)
<i>ROE</i>					0.0016 (0.0034)
<i>IND</i>	controlled	controlled	controlled	controlled	controlled
<i>YR</i>	controlled	controlled	controlled	controlled	controlled
Observations	1,164	1,164	1,164	1,164	1,164
Sample Size	388	388	388	388	388
<i>R-squared</i>	0.144	0.146	0.149	0.154	0.154

*C2. Regression Results for the Manufacturing Industry*

Manufacturing companies account for more than 60% of the entire sample in this paper. To further verify the robustness of the previous empirical results, this paper uses the DID model to conduct a regression analysis of the manufacturing industry subsamples. The regression results shown in Tables 20 to 22 indicate that H1 to H3 still hold when only manufacturing companies are considered. The original regression results are therefore stable.



**Table 20.**  
**VC and CEO Duality (Manufacturing Industry)**

This table reports results of the VC and CEO duality relation (manufacturing industry). The statistics in () is the *t*-statistic. Column (1) shows the regression results without control variables, and columns (2)-(4) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	<i>Dual</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Vc*exit_before</i>	1.026*	1.191**	1.754***	1.874**	1.897**
	(0.608)	(0.471)	(0.626)	(0.740)	(0.789)
<i>Growth</i>		-0.505**	-0.626***	-0.597***	-0.598***
		(0.222)	(0.147)	(0.177)	(0.173)
<i>Size</i>			-1.238**	-1.357*	-1.400**
			(0.568)	(0.719)	(0.697)
<i>Lev</i>				-0.219	-0.252
				(2.769)	(2.785)
<i>ROE</i>					0.390
					(0.772)
<i>YR</i>	controlled	controlled	controlled	controlled	controlled
Observations	779	779	779	779	779
Sample Size	260	260	260	260	260

**Table 21.**  
**VC and Board Size (Manufacturing Industry)**

This table reports results of the VC and board size relation (manufacturing industry). The statistics in () is the *t*-statistic. Column (1) shows the regression results without control variables, and columns (2)-(4) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	<i>bsize</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Vc*exit_before</i>	0.199**	0.191**	0.201**	0.201**	0.188**
	(0.0920)	(0.0918)	(0.0911)	(0.0910)	(0.0931)
<i>Growth</i>		0.0444*	0.0538**	0.0512**	0.0518**
		(0.0233)	(0.0232)	(0.0234)	(0.0234)
<i>Size</i>			0.416***	0.459***	0.465***
			(0.0986)	(0.108)	(0.109)
<i>Lev</i>				-0.386	-0.399
				(0.400)	(0.401)
<i>ROE</i>					-0.0684
					(0.106)
<i>YR</i>	controlled	controlled	controlled	controlled	controlled
Observations	780	780	780	780	780
Sample Size	260	260	260	260	260

Table 22.  
VC and Proportion of Independent Directors (Manufacturing Industry)

This table reports results of the VC and proportion of independent directors relation (manufacturing industry). The statistics in () is the *t*-statistic. Column (1) shows the regression results without control variables, and columns (2)-(4) show the results that contain additional control variables than the previous column. Coefficients significant at the 10%, 5% and 1% level is indicated with \*, \*\*, \*\*\*, respectively. Finally, for variable definitions, please refer to Table 1.

Variables	<i>outdire</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Vc*exit_before</i>	0.0135** (0.0053)	0.0131** (0.0053)	0.0134** (0.0053)	0.0134** (0.0053)	0.0117** (0.0054)
<i>Size</i>		-0.0084* (0.0046)	-0.0094** (0.0047)	-0.0117** (0.0051)	-0.0109** (0.0051)
<i>Growth</i>			-0.0016 (0.0013)	-0.0014 (0.0013)	-0.0013 (0.0013)
<i>Lev</i>				0.0235 (0.0199)	0.0221 (0.0198)
<i>ROE</i>					-0.0089 (0.0062)
<i>YR</i>	controlled	controlled	controlled	controlled	controlled
Observations	780	780	780	780	780
Sample Size	261	261	261	261	261

V. CONCLUSION AND POLICY SUGGESTIONS

By using a DID model, multiple linear regression, probit regression, logit regression, and other methods, this paper explores the impact of VC participation on the board characteristics and performance of GEM-listed companies. We find that VC participation has a positive influence on certain board characteristics that improve company performance. In our samples, VC-backed GEM-listed companies are inclined to choose the CEO duality structure, have a larger board of directors and a higher proportion of independent directors, and gain better performance as a result.

Based on the analysis above, this paper suggests the following. First, VC institutions in China should continuously improve their professional level, enrich their social resources, and increase the introduction and training of professional talent, thus enhancing the professional level of the entire industry. Moreover, government departments should actively guide the development of the VC industry, for example, by instituting laws and regulations, and prevent VC institutions from harming the development of startups for their own interests. Last but not the least, the state should create a sound multilevel capital market to broaden the exit channels of VC institutions, allowing VCs to exit more smoothly, and encourage VC institutions to invest in more enterprises.

## REFERENCE

- Baker M, Gompers P A. (2003). The Determinants of Board Structure at the Initial Public Offering. *The Journal of Law and Economics*, 46, 569-598.
- Fama E F, Jensen M C. Separation of Ownership and Control. (1983). *The Journal of Law and Economics*, 26, 301-325.
- Han Y. (2015). The Impact of Board Characteristics on Corporate Performance: An Empirical Study Based on China's SSE A-Share Company. *Market Modernization*, 22, 110-114.
- Kiel G C, Nicholson G J. (2003). Board Composition and Corporate Performance: How the Australian Experience Informs Contrasting Theories of Corporate Governance. *Corporate Governance: An International Review*, 11, 189-205.
- Li T. (2015). An Empirical Study on the Relationship between Board Characteristics and Firm Performance: Taking Listed Companies in Hubei Province as an Example. *Contemporary Economy*, 8, 15-18.
- Lipton M, and Lorsch J. W. (1992). A Modest Proposal for Improved Corporate Governance. *The Business Lawyer*, 59-77.
- Liu S. (2011). *Empirical Research on the Characteristics of the Board of Directors and Business Performance*. Southwestern University of Finance and Economics.
- Liu Y, Chang J. (2009). Research on the Relationship between Board Characteristics and Performance of Small and Medium-sized Board Listed Companies. *China Collective Economy*, 22, 144-145.
- Manigart S, Baeyens K, Van Hyfte W. (2002). The Survival of Venture Capital Backed Companies. *Venture Capital: An International Journal of Entrepreneurial Finance*, 4, 103-124.
- Pearce J A, and Zahra S. A. (1991). The Relative Power of CEOs and Boards of Directors: Associations with Corporate Performance. *Strategic Management Journal*, 12, 135-153.
- Suchard J. A. (2009). The Impact of Venture Capital Backing on the Corporate Governance of Australian Initial Public Offerings. *Journal of Banking & Finance*, 33, 765-774.
- Wang Y. (2012). *Research on the Impact of Board Characteristics of GEM Listed Companies on Corporate Performance*. Dongbei University of Finance and Economics.
- Wu C, Wu S, and Cheng J, et al. (2012). Empirical Study on the Impact of Venture Capital on Investment and Financing Behavior of Listed Companies. *Economic Research*, 1, 105-119.
- Xie H. (2011). Empirical Study of Board Characteristics and Corporate Performance: Experience Analysis of Listed Companies in Henan Province. *Journal of Zhengzhou Institute of Aeronautical Industry Management*, 2, 58-61.
- Zhang X. (2012). Characteristics of Board of Directors and Corporate Performance of Listed Companies. *Accounting News*, 6, 59-61.
- Zhang X, and Liao L. (2011). Venture Capital Background and IPO: Market Performance and the Internal Mechanism. *Economic Research*, 6, 118-132.
- Zhao W, Wen J. (2015). Venture Capital, Executive Compensation and Board Characteristics: from the Perspective of Company Governance. *Financial Research*, 4, 34-45.