# Empirical Analysis of the Impact of VC/PE Shareholding Ratio on Enterprise Valuation--take Science and Technology as Examples

Xuefei Wang

International Business College, Dongbei University of Finance & Economics, Dalian, 116025, China
wangxuefei@stumail. dufe. edu. cn

**Abstract.** Along with the diversified development of capital market, Venture Capital/Private Equity (VC/PE) Financing becomes an important funding sources of startups and growth businesses,providing financial support for enterprises to play a key role in the company' s strategic planning and resource allocation. As the core basis of transaction pricing and investing decision evaluation, the relevance between enterprise valuation and Venture Capital/Private Equity (VC/PE) financing ratio is also the focus of capital market attention. This paper selects Venture Capital/Private Equity (VC/PE) shareholding ratio as the core explanatory variable, enterprise market value and P/E ratio as the explanatory variable. This research uses descriptive statistics, correlation analysis, linear regression analysis and other methods to clarify the relevance between Venture Capital/Private Equity (VC/PE) shareholding ratio and enterprise valuation. Selecting 39 Chinese technology enterprises, it is found that the proportion of Venture Capital/Private Equity (VC/PE) holdings itself is significantly negatively correlated with market value, and is significantly positively correlated with market value after adding control variables.

**Keywords:** Enterprise Valuation, VC/PE Financing, Private Equity Investments.

## 1 Introduction

Private Equity(PE), is an equity investment economic form in non-public transactions of non-listed companies or listed companies, which provides financial support for the rapid expansion of enterprises. Venture Capital(VC) finances start-ups through equity investments and focuses on early projects with high risk and high returns.

The earliest PE/VC activities date to the late 19th century. Until 1946,the foundation of ARD in Boston marked the real birth of the modern venture capital industry. For China, the private equity market has growth rapidly since 2001. Nowadays, VC/PE financing has become an important source of funds for start-ups and growth enterprises, and plays a key role in corporate strategic planning and resource allocation. In 2025, Abu Dhabi's sovereign wealth fund, Mubadala investment company, announced that it

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planned to increase its Asian investment share from nearly 13% to nearly 25% in the next decade. China is regarded as its core market, and corporate valuation is the core basis for the evaluation of the investment decision. YUAN R. believed that VC/PE financing provides help for the development of AI start-ups in China[1]. The development of science and technology enterprises in China depends highly on external capital support. Technology enterprises' fluctuation of enterprise valuation is obvious, and its correlation with VC/PE financing ratio is the focus of market attention.

At present, the international research on private equity investment mainly involves the growth potential of private equity for listed companies. Lei found that using the company's net profit and P/E ratio as indicators, the growth ability of enterprises increased with the increase of VC shareholding ratio [2]. Pelaji ć E. also concluded that PE supports the growth and development of enterprises through interviewing with Croatian VC/PE Institutions [3]. Song Na,Zasępa P and Li Z all mentioned that the participation of PE/VC has significantly increased the company's share price, but Song Na also believes that the proportion of private equity holdings has no significant impact on corporate value [4-6]. Ahtiainen V and Matanova N put forward different views on the correlation between the addition of VC/PE and the company's performance. The former thinks PE/VC is conducive to the market performance of enterprises, while the latter believes that VC has a significant negative impact on the performance of enterprises and PE has the opposite effect [7, 8]. Shiwei Yang concluded private equity participation promotes the company's profitability to a certain extent, but is negatively correlated with the company's shareholding ratio [9]. Gupta A's research shows that the average private equity fund is negatively correlated with the expected returning rate of enterprises [10].

Therefore, this paper focuses on the technology enterprises listed in China's A-share and Hong Kong stock markets since 2016, assuming that the proportion of VC/PE holdings is significantly correlated with the market value and the P/E ratio of enterprises. This paper uses descriptive statistics, correlation analysis, regression analysis to clarify the correlation between financing ratio and start-up valuation, which can not only help enterprises rationally allocate financing structure to improve enterprise valuation, but also provide investors with more scientific data support for evaluating enterprise value. It has important theoretical significance for standardizing capital market financing behavior and improving the efficiency of resource allocation.

## 2 Methodology

### 2.1 Data Sources

This paper obtains enterprise financial data through CSMAR database, Royalflush INFO Ifind and combines with enterprise public disclosure documents to sort out the overall characteristics of the sample data. Correlation analysis was used to verify the correlation between VC/PE shareholding ratio and various financial indicators. Linear regression analysis was used to test the hypothesis to clarify the significance level of the linear relationship between them.

### 2.2 Variable Definition

Using cross section data, this paper selects 39 enterprises listed after 2016. The market value and P/E of enterprises was regarded as explanatory variables. This paper takes the VC/PE shareholding ratio ,which complete the latest round of VC/PE before listed ,as the core explanatory variable. Because the largest private equity shareholder usually has the most significant impact on corporate decision-making and governance, so the largest private equity shareholding ratio is selected as the proxy variable of the VC/PE shareholding ratio. Explanatory variables and control variables all use the data at the end of the year of listing to ensure the unity and effectiveness of the impact of VC/PE financing on corporate valuation, as shown in Table 1.

**Table 1.** Variable definition

| Type of Variable | Name of Variable | Symbol | Construction |
|---|---|---|---|
| Explained Variable | Market Capitalization | MC | ln (At the end of the IPO year, the company's total equity multiplied by the stock price at that time) |
| | price-to-earnings ratio | P/E | Market Price per Share divided by Earnings per share |
| Explanatory Variable | PE/VC shareholding Ratio | PE/VC Ratio | The ratio of Private Equity/Venture Capital's shareholders |
| Control Variable | Operate Revenue | Size | ln (At the end of the IPO year，Revenue obtained by the enterprise from its main business) |
| | Net Profit | Growth | EBIT minus income tax expense |
| | Asset-liability ratio | Lev | Total Assets divided by Total Liabilities |
| | ROE | ROE | Net Income divided by Average Shareholders' Equity |

### 2.3 Modelling

The following four models are used to explore the individual effects of VC/PE shareholding ratio on corporate market capitalization and price-to-earnings ratio, as well as their combined effects after adding control variables.

Model 1:

$$\ln MC = \alpha + \beta_1 PEVCratio + \varepsilon \tag{1}$$

Model 2:

$$\ln MC = \alpha + \beta_1 PEVCratio + \beta_2 \ln Size + \beta_3 Lev + \beta_4 ROE + \beta_5 Growth + \varepsilon \tag{2}$$

Model 3:

$$P/E = \alpha + \beta_1 PEVC\text{ratio} + \varepsilon \tag{3}$$

Model 4:

$$P/E = \alpha + \beta_1 PEVCratio + \beta_2 \ln Size + \beta_3 Lev + \beta_4 ROE + \beta_5 Growth + \varepsilon \quad (4)$$

# 3 Empirical Results

## 3.1 Descriptive Statistics

Table 2 presents the results of the descriptive statistical analysis, detailing the number of enterprises, minimum, maximum, mean, and standard deviation.

**Table 2.** Descriptive Statistics

| | N | Min | Max | Mean | standard deviation |
|---|---|---|---|---|---|
| VC/PE Ratio | 39 | . 80 | 35. 57 | 11. 54 | 9. 64 |
| ln MC | 39 | 22. 23 | 25. 71 | 23. 75 | . 92 |
| P/E | 39 | -256. 30 | 262. 09 | 66. 54 | 81. 88 |
| ln Size | 39 | 19. 35 | 25. 14 | 21. 20 | 1. 32 |
| Growth | 39 | -916323486. 13 | 2936199242. 88 | 378853179. 62 | 647156460 . 76 |
| Lev | 39 | 3. 14 | 74. 73 | 24. 59 | 19. 07 |
| ROE | 39 | -. 53 | . 44 | . 11 | . 15 |

As shown in Table 2, the minimum value of VC/PE shareholding ratio is 0. 80% and the maximum value is 35. 57%. There is a significant gap in private equity holdings ratio among sample enterprises, and the corporate governance structure and financing methods of science and technology industry are diverse. The mean of the logarithm of market value is 23. 75 and the standard deviation is 0. 92. The distribution is relatively concentrated, while the market value scale of the selected enterprises has little difference. The standard deviation of P/E ratio is as high as 81. 88, and the range of minimum and maximum values is very large. The sample includes loss making enterprises and enterprises with extremely high P/E ratio. The log average of operating income is 21. 20 with the standard deviation is 1. 32, indicating that the scale distribution of enterprises is relatively uniform. The standard deviation of net profit is 647 million yuan. The profitability of enterprises is obviously different, and some enterprises have serious losses. The average asset liability ratio is 24. 59% and the maximum is 74. 73%. The overall asset liability level is low, but some enterprises have high leverage ratio and may face higher financial risks. The standard deviation of ROE is 15. 14%, the minimum value is - 53. 24%, and the maximum value is 43. 97%. The difference of profitability is obvious. The ROE of some enterprises is negative,while the profitability of enterprises is at a medium level. Overall, there are great differences

in profitability and capital structure among the samples. Some variables (such as P/E ratio and net profit) have extreme values. Table 2 clearly displays the data characteristics of each variable,but further statistical analysis is needed to clarify the relationship between the proportion of private equity holdings and enterprise valuation.

### 3.2 Correlation Analysis

**Table 3.** Correlation Analysis

| | | VC/PE Ratio | ln MC | P/E | ln Size | Growth | Lev | ROE |
|---|---|---|---|---|---|---|---|---|
| VC/PE Ratio | Pearson correlation | 1 | -. 48** | . 23 | -. 46** | -. 24 | -. 25 | . 10 |
| | Significance | | . 00 | . 16 | . 00 | . 15 | . 12 | . 55 |
| | Number | 39 | 39 | 39 | 39 | 39 | 39 | 39 |
| ln MC | Pearson correlation | -. 48** | 1 | -. 18 | . 66** | . 54** | . 21 | -. 01 |
| | Significance | . 00 | | . 28 | . 00 | . 00 | . 21 | . 96 |
| | Number | 39 | 39 | 39 | 39 | 39 | 39 | 39 |
| P/E | Pearson correlation | . 23 | -. 18 | 1 | -. 14 | . 17 | -. 11 | . 34* |
| | Significance | . 16 | . 28 | | . 39 | . 31 | . 49 | . 03 |
| | Number | 39 | 39 | 39 | 39 | 39 | 39 | 39 |
| ln Size | Pearson correlation | -. 46** | . 66** | -. 14 | 1 | . 76** | . 64** | . 25 |
| | Significance | . 00 | . 00 | . 39 | | . 00 | . 00 | . 12 |
| | Number | 39 | 39 | 39 | 39 | 39 | 39 | 39 |
| Growth | Pearson correlation | -. 24 | . 54** | . 17 | . 76** | 1 | . 36* | . 44** |
| | Significance | . 15 | 0. 00 | . 31 | . 00 | | . 02 | . 01 |
| | Number | 39 | 39 | 39 | 39 | 39 | 39 | 39 |
| Lev | Pearson correlation | -. 25 | . 21 | -. 11 | . 64** | . 36* | 1 | -. 06 |
| | Significance (two-tailed) | . 12 | . 21 | . 49 | . 00 | . 02 | | . 71 |
| | Number | 39 | 39 | 39 | 39 | 39 | 39 | 39 |
| ROE | Pearson correlation | . 10 | -. 01 | . 34* | . 25 | . 44** | -. 06 | 1 |
| | Significance (two-tailed) | . 55 | . 96 | . 03 | . 12 | . 01 | . 71 | |
| | Number | 39 | 39 | 39 | 39 | 39 | 39 | 39 |

**. At the 0. 01 level (two-tailed), the correlation is significant.

*. At the 0. 05 level (two-tailed), the correlation is significant.

In Table 3, there is a significant negative correlation between VC/PE shareholdings ratio and the logarithm of market value. This shows that the increase of VC/PE shareholding ratio will reduce the valuation of enterprises, while private equity funds are more inclined to hold shares of companies with smaller market value and smaller assets. Private equity may have a "small scale preference". The correlation between VC/PE shareholding ratio and P/E ratio has not reached a significant level, indicating that there is no significant linear relationship between private equity shareholding ratio and the company's P/E ratio. Private equity may pay more attention to the company's growth potential or other non-financial factors. The correlation between VC/PE shareholding ratio and control variables such as asset liability ratio and ROE did not reach a significant level. The results of correlation analysis show that private equity is mainly negatively correlated with company size indicators such as market value and assets, but not with profitability, valuation, financial risk and other indicators. This result provides a basis for regression analysis, indicating that when exploring the impact of VC/PE shareholding ratio on enterprise valuation, people need to control factors such as company size and capital structure.

### 3.3 Linear Regression Analysis

**Table 4.** Linear regression analysis

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| VC/PE Ratio | -0. 05** | -0. 01 | 1. 97 | 0. 33 |
| | (0. 01) | (0. 01) | （1. 36） | (1. 50) |
| ln Size | | 0. 58** | | -44. 51* |
| | | (0. 16) | | （19. 93） |
| Growth | | 2. 29E-10 | | 6. 629E-8 |
| | | (0) | | (0) |
| Lev | | -0. 02** | | 0. 80 |
| | | (0. 01) | | (0. 89) |
| ROE | | -1. 82* | | 163. 61 |
| | | (0. 78) | | (94. 43） |
| Constant | 24. 27** | 12. 33** | 43. 78* | 942. 63* |
| | (0. 21) | (3. 36) | （20. 32） | (408. 30) |
| $R^2$ | 0. 23 | 0. 61 | 0. 05 | 0. 28 |
| Adjusted $R^2$ | 0. 21 | 0. 55 | 0. 03 | 0. 17 |

Note: Standard errors in parentheses. Model 1, model 2 dependent variable: market value. Model 3, model 4 dependent variable: P/E ratio. *p<0. 05 **p<0. 01

**Table 5.** Linear regression analysis

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| VC/PE Ratio | -0. 05** | -0. 01 | 1. 97 | 0. 33 |

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| | (-3. 32) | (-1. 05) | (1. 45) | (0. 22) |
| ln Size | | 0. 58** | | -44. 51* |
| | | (3. 51) | | （-2. 23） |
| Growth | | 2. 29E-10 | | 6. 629E-8 |
| | | (0. 87) | | (2. 06) |
| Lev | | -0. 02** | | 0. 80 |
| | | (-2. 86) | | (0. 90) |
| ROE | | -1. 82* | | 163. 61 |
| | | (-2. 34) | | (1. 73) |
| Constant | 24. 27** | 12. 33** | 43. 78* | 942. 63* |
| | (118. 15) | (3. 67) | (2. 16) | (2. 31) |

Note: T value in parentheses. Model 1, model 2 dependent variable: market value. Model 3, model 4 dependent variable: P/E ratio. *p<0. 05 **p<0. 01

In Table 4, the $R^2$ of model 1 and model 2 is 21% and 55% respectively. The proportion of VC/PE holdings can predict the market value of enterprises to a certain extent. After adding control variables such as operating income and asset liability ratio, the explanatory power of the model is significantly improved, which can prove that VC/PE financing has a considerable impact on enterprise valuation. Model 3 and model 4's $R^2$ are 2. 8% and 17. 1% respectively, which proves that the P/E ratio is a complex variable and affected by multiple factors of enterprises.

According to Table 4 and Table 5, the coefficient of VC/PE shareholding ratio is -0. 05 in Model 1and shows a significant negative correlation with market value alone, which verifies the view that private equity may have short-term speculation. In model 2, the shareholding ratio coefficient decreases sharply and is no longer significant, but the significant positive impact of operating income, asset liability ratio and ROE on market value is highlighted. It shows that private equity institutions tend to invest in smaller and highly leveraged enterprises. The low market value of enterprises themselves leads to the illusion that the high proportion of private equity holdings will reduce the market value. After adding control variables , the proportion of private equity and market value are no longer significant, indicating that private equity is not an independent determinant of market value. In model 3 and model 4, the linear relationship between VC/PE shareholding ratio and P/E ratio is not significant. It can be speculated that the P/E ratio of enterprises is affected by many non-financial factors, such as macroeconomic activities.

## 4 Conclusion

The correlation analysis results in this paper show that private equity holdings are significantly negatively correlated with corporate market capitalization , but not significantly linearly correlated with profitability, valuation and financial risk. An increase in VC/PE shareholding ratios lowers corporate valuation. The negative impact of VC/PE shareholding ratios on market capitalization disappears after adding control

variables such as debt-to-equity ratio and operating revenue. It can be concluded that investors should not view PE/VC shareholding ratios independently, but should comprehensively assess their valuation impact in conjunction with corporate characteristics. For regulators, guiding private equity investment and improving corporate governance are more important than focusing solely on shareholding ratios.

The sample size is too small, with only 39 companies, leading to less robust results and susceptibility to extreme values. The control variable system is incomplete, including only four control variables and failing to consider factors that significantly influence listing valuations, such as equity concentration, the proportion of independent directors and industry competition. The impact of the listing time span of the sample companies is not considered. The distribution of listing years among the sample companies is relatively dispersed and the impact of the capital market on corporate listing valuations varies across different periods, potentially interfering with the impact of VC/PE shareholdings on valuation. Future research should use a full sample or include more companies as research subjects, and employ diversified industry-specific market capitalization assessment methods.

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