

Human Capital of Venture Capital and Investing Performance

---Analysis Based on Chinese Marco Data

Yuxuan Lv¹

¹ School of Economy, Jinan University, Guangzhou, China

Correspondence: Yuxuan Lv, School of Economy, Jinan University, Tianhe District, Guangzhou, China. Tel: 86-132-4973-8820.

Received: March 24, 2017

Accepted: April 6, 2017

Online Published: April 7, 2017

doi:10.20849/ajsss.v2i1.140

URL: <https://doi.org/10.20849/ajsss.v2i1.140>

Abstract

Based on the macro data from 2006 to 2013 of Chinese venture capital institutions, this paper studies the relationship between the average human capital level and the investment performance and its impact mechanism using factor analysis and regression analysis. The paper finds that the overall performance level of the venture capital industry in China is influenced by different dimensions of human capital in different index, and it is also constrained by the economy developing level and investment environment. For example, in 2008 and 2013 IPO suspended which significantly weakened the influence of human capital (as opposed to individual institutions).

Keywords: venture capital human capital investment performance

1. Introduction

Venture capital has been developing in China since 1980s, offering Chinese economy growth the vitality and motivation. With China's continuous deepening of reforming and opening of economic environment, the gap of quality and quantity in venture capital attracts attention. According to the latest statistics on China's Venture capital Yearbook, China's venture capital investment institutions totaled 1408, raised was 82.412 billion yuan till 2013. By 2014, China's total venture capital reached 948.445 billion yuan, two times the highest amount reached in 2011.

High return is one of the inductions of the development of venture capital. Different venture capital mechanisms, including corporate strategy, management model, capital structure closely relate to professional labors and other factors. From the beginning of screening and evaluating, they indirectly or directly impact on the effectiveness and benefits of venture capital investment. The venture capital investing stages and factors mentioned both reflect the subjective initiative of human capital, which comes the perspective of this study, and the study's innovation is that the paper select the "big" data reflecting the overall situation of China's venture capital.

The academic research on venture capital get rich with practice, and the appreciation of venture capitals becomes the focus of scholars at home and abroad. On the one hand the scholars follow the promotion of start-up company value, on the other hand is the simple investment income the venture capital brings to institution. Venture capital not only provides funds for enterprises, but also provides management, consulting and other services to promote innovation, and thus increase the success possibility of its listing (Keuschnigg 2004). When listing, the participation of venture capital often brings the company various degrees of IPO underpricing (Chen 2011; Zhang & Liao 2011).

After the issuance of new shares, the impact of venture capital is still continuing. Some studies have shown that the existence and difference of venture capital background made the company show distinguishing performance after listing (Zhang & Liao, 2011). After listing the venture capital, if the company did not withdraw from it can reduce the over-investment behavior relieve the shortage of internal cash flow and bring new investing and financing opportunities (Wu et al., 2012). From the analysis of local data in China, the every stage and concerning aspects of venture investment behavior including institutional characteristics, project cycle, exit mode and so on, have affected the return and performance of the investment (Qian & Zhang, 2007). Among them, human capital as a major factor in institutional characteristics, as a separate and important object, are widely studied. The average age and term of executives, their length of education years, government background, all have a lot to do with the growth and performance of the venture capital institutions. At present, scholars pay

more attention on the specific venture capital institution and its effect on and individual listed companies. This paper takes the development process of venture capital as the background, based on macroeconomic and national data, focuses on the overall and average level of venture capital in China, considers the international IPO stagnation, studies the human capital and investment performance of venture capital institutions, and explore the underlying causes.

2. Influencing Mechanism of Venture Investment Performance and Research Hypothesis

2.1 Human Capital

According to research targets and objectives, this paper discusses influencing mechanism of venture investment performance from perspectives of human capital, Chinese economy and investment environment.

1) Project Appraisal

Venture investment is a high-risk and high-yield investment activity, while information between investment institutions and entrepreneurial firm is always asymmetric. In such a —Lemon || market, the screening and assessment of project quality are especially important. General screening criteria include: clear recognition, excellent managers and expected return. Therefore, concerning selecting and guiding newly-established firms and realizing expected profits successfully, venture capital institutions and relative personnel play a valuable role. As representatives of intellectual capital, venture investors would assess and screen investment plans cautiously and predict future performance (Kaplan & Stromberg, 2001; Zarutskie, 2010, while this screening is especially crucial in economic downturn (Bottazz et al, 2008).

2) Investment Strategy

After establishing investment project, venture investors would establish investment stages, industries (diversity or unicity), regions (broad or narrow) and other investment strategies. In the end, different investment performance would be created on different scientific educational background, entrepreneurial experiences, overseas experiences of senior administration teams and other human capital (Patzelt, 2009). Because of the diversity of risk investment withdrawal ways and giant gap of corresponding returns, after the investment, how venture investment should conduct tract management on the project and choose appropriate withdrawal way to realize earnings and even stop damages timely in an emergency all rely on the judgment and decision of management personnel's market analysis abilities and professional knowledge and qualities.

3) Corporate Governance

According to division of Chinese Venture Investment Yearbook, management mode of Chinese venture investment agencies can be divided into: investment type, management type and investment & management type. Human capital of different types of talents of the management groups represent management theoretical standard and experience and influences corporate strategies and management performances. Senior executives' education degree is usually positively correlated to their major and comprehensive abilities, while the tenure (or period of actual operation) of senior executives usually means the degree of sediment of knowledge and capital. The increase of this type of human capital can all be transformed to advantages of understanding ability and executive force, thereby bringing in more effective information and formulating more suitable enterprise development strategy (Wu Bin, etc., 2011).

2.2 Economy and Investment Environment

Because of demands for capital and potential projects, venture investment relies on the entire financial environment, so its development has been increasingly fierce with the deepening opening of Chinese economy and gradual completion of financial market. Because of this, the financing channels and withdrawal channels of venture investment are contained by the entire investment environment. The rapid development of Chinese economy provides soil and opportunities to venture investment; meanwhile, the immature and problematic capital market also launches challenges to it.

For example, the global financial crisis in 2008 and the two times of IPO stagnation brought by financial examination of Chinese supervision department in 2013 forced many agencies to reduce financing and investment activities comprehensively, and depression appeared in industries. IPO returns those years were 4.11 times and 3.02 times respectively, declining 37.06% and 31.5% on year-on-year basis.

2.3 Research Hypothesis

In conclusion, venture investment performance is influenced by human capital under the containment of general economic environment, and the influence dimensionalities mainly include education degree, professional knowledge background, senior executive's tenure or working experience, overseas experience, entrepreneurial

experience, economic situation, IPO prospects, etc.

Based on the above analysis, research target and data of this thesis, project successful exit rate, IPO return rate and so on are used in this paper to measure venture investment performance. As for human capital, it will be studied from the following aspects:

- 1) Number of investment managers: represent professional investment and relative management talents.
- 2) Educational background: measured by education background, and it is a representation of comprehensive human capital.
- 3) Working years: the accumulation of working years is beneficial to making correct decisions.
- 4) Professional knowledge background: mainly include scientific and technological background, enterprise management background and financial capital operation background, the larger the proportion of talents with these background is, the higher the successful exit rate is. (Zarutskie, 2010)

According to analysis in the above parts, the following hypotheses are made:

Hypothesis: the integral investment performance of Chinese venture investment is positively correlated to various elements of human capital; meanwhile, it is under the influence of Chinese economic situation and investment environment.

3. Data and Empirical Strategy

3.1 Samples and Data

This paper chooses statistical data presented on the second to fifth chapter of 2008's to 2013's China Venture capital Yearbook, which about Chinese and foreign venture capital institutions investing characteristics and performance. The collection of sample companies from the venture capital survey statistics accounted for more than 60% of all venture capital institutions, taking into account the all districts, with universal representation and credibility. The following data we used represent the average and overall level.

3.2 Variables

The study put the description and definition of involving variables in Table 1. Following context explain some related information and key specification.

Table1. Definition and interpretation of variables

| variables | definition and interpretation |
|---------------------|----------------------------------------------------------------------|
| exit_ratio | the proportion of quit project of total project |
| IPO_ratio | the proportion of listed project of total project |
| performance index | weighted computing performance |
| IPO return | the return of listed project |
| manager | average number of investing managers |
| education index | weighted computing education background |
| working year index | weighted computing working years |
| science background | means the proportion of the stuff who has a kind of major background |
| managing background | |
| Finance background | |
| capital managed | the logarithm of average capital scale |
| investing intensity | Investing amount of individual project |
| economy | logarithm of GDP |
| factor | the factor computed according to factor analysis |
| dummy_IPO | if the IPO suspended in that year, the dummy value is 1, or is 0. |

- 1) Among dependent variables, quitting ratio measures the proportion of venture capital projects quitting in the form of equity transfer.
- 2) For exponential variables, this paper takes the assignment method and the group median calculation method.
 - a) Education background index. From low to high, specific score are given to different qualifications: Bachelor of the following 1, Bachelor of 2, Master, MBA, EMBA, PHD degrees were 3, 4 and 5 respectively.
 - b) Working years and investing performance. For the yearbook just give the level of range, for instance, between 3~6years or 15%~30%, the paper takes median value in related range as weight to simulate the average and overall level of sample venture capitals. When a venture capital institution has 10 workers who have related working experience between 3~6years, so it gets 45 scores. The author uses the Monte Carlo experiment to interpret the process, and the results show that the method introduced above is appropriate.
- 3) In the study, the capital scale, investing intensity and GDP (gross domestic product) are measured in the form of natural logarithm, which present the level of investment and development. In the correlation test, the correlation between the three variables is very strong (see Table 2). Because of the restriction of observations and former variable which is exposed to multiple collinearity problem, this paper uses factor analysis method to reduce dimensionality, getting the control-variable factor to do weighted calculation.

Table 2. Correlation test

| variable | capital managed | investing intensity | GDP |
|---------------------|-----------------|---------------------|-----|
| capital managed | 1 | | |
| investing intensity | 0.828 | 1 | |
| GDP | 0.687 | 0.86 | 1 |

Using SPSS19.0 software for factor analysis, the result shows that the KMO value is 0.671, which is suitable for factor analysis. The variance contribution rate comes to 86.19% and the explanation ability is good.

Table 3. Factor analysis result

| variable | factor score | variance contribution | KMO |
|---------------------|--------------|-----------------------|-------|
| capital managed | 0.349 | 86.192% | 0.671 |
| investing intensity | 0.374 | | |
| GDP | 0.354 | | |

The function of the factor is:

$$factor=0.86192(0.349*capital_managed+0.374*investing_intensity+0.354*economy) \tag{1}$$

- 4) Listing is the most important quitting way to obtain the most return in venture capital. Domestic and foreign IPO environment both have a direct impact on the raising, investing, exiting and other aspects of venture capital industry, so we set a IPO dummy variable to control market environment. At the same time we set IPO return rate, another dependent variable which merely measures the rate of successfully listed projects. According to the memorandum announced by yearbook, the IPO suspended in 2008 and 2013.

So Table 4 shows the descriptive statistical results.

3.3 Model

In order to test the true relation between human capital and venture capital performance, the following model is established based on variables set above (in order to simplify the model, we use the abbreviation of variable names). In the function, "performance" represents the four measuring types of venture capital performance the study concerns, and they will enter the model separately:

$$performance = \beta_0 + \beta_1 manager + \beta * human\ capital + \beta_7 * CM + \beta_8 * II + \beta_9 * economy + \beta_{10} * dummy \tag{2}$$

4. Empirical Results and Analysis

Eviews8.0 software is used for unit root test of the sequence. ADF is larger than the critical value, indicating that the sequence is stable. In order to eliminate multicollinearity, this paper adopts Steples (stepwise regression stepwise regression) estimation method to get rid of variables which are not significant and have high correlation with other variables in the matching and obtain the optimal model estimation. Refer to Table 5 for regression results.

Table 4. Descriptive statistics

| variables | mean | standard deviations |
|---------------------|---------|---------------------|
| exit_ratio | 96.67% | 0.0198 |
| IPO_ratio | 28.45% | 0.0830 |
| performance index | 0.4654 | 0.0689 |
| IPO return | 6.3813 | 2.9667 |
| manager | 13 | 3.0706 |
| education index | 2.7126 | 0.0827 |
| working year index | 6.4115 | 0.5510 |
| science background | 25.31% | 0.0321 |
| managing background | 29.04% | 0.0341 |
| Finance background | 32.27% | 0.0120 |
| capital managed | 20.7062 | 0.3615 |
| investing intensity | 18.0378 | 1.2373 |
| economy | 31.2475 | 0.3479 |
| factor | 21.5775 | 0.5854 |

4.1 Human Capital Dimensionality

1) Quitting ratio

From the regression results, it is found out that venture investment withdrawal rate is positively correlated to the scientific and technological background, educational standard and control variable of the management team. However, the coefficient of human capital is not significant, P value is around 0.18. Non-significant coefficient is related to small inner difference of withdrawal rate (the standard deviation is only 0.0198), but the positive influence of human capital element on withdrawal rate still can be seen.

2) Proportion of projects existing in the form of IPO is significantly correlated to education standard and financial capital operation, and it has economic significance. Whenever the index of educational background increases by 1 point, IPO withdrawal rate would increase by 53.37%; when financial background increases by 1%, IPO withdrawal rate would increase by 1.0357%, indicating that the improvement of human capital in some dimensionality would improve the proportion of Chinese venture project IPO withdrawal rate; the withdrawal methods are optimized, which is beneficial to the increase of earnings. As for the result that the number of investment managers turns to negative, the author has not found accurate explanation yet.

3) Performance index

From the chart, we can see that the integral performance standard of Chinese venture investment is significantly correlated to the experience standard of financial capital operation of agency management team, which indicates that the capital management and operational techniques have improved the utilization rate of capital, optimized investment approaches and improved the performance standard of venture investment practically. Though the coefficient of scientific and technological background conform to the hypothesis, but it is not significant.

4) IPO return rate

IPO return rate and the regression result of independent variable also conform to the research hypothesis.

Especially enterprise management background is significantly correlated to IPO return rate. When the average proportion of talents with management experiences increase by 1%, IPO return rate would improve by 0.9 time. In the meantime, working years also have huge influences on IPO return rate, and the coefficient is 4.53, while this kind of human capital is especially important in the high uncertainty of IPO market. When IPO is blocked or even stagnant, the rich working experience of investment personnel and the sufficient professional reserve of management personnel can help venture investment agencies choose correct withdrawal timing, withdrawal mechanism and come into the market when IPO market is not optimistic.

Table 5. Regression result

| | exit_ratio | IPO_ratio | performance index | IPO return |
|---------------------|----------------------|------------------------|-----------------------|------------------------|
| manager | | -0.0388 (0.0014) | | |
| education index | 0.1246 (0.1968) | 0.5337*** (0.0024) | | |
| working year index | | | | 4.5314** (0.0135) |
| science background | 0.1584 (0.1743) | | 0.7095 (0.3070) | |
| managing background | | | | 90.0411** (0.01701) |
| Finance background | | 1.0357** (0.0198) | 1.4434*** (0.0000) | |
| factor | 0.0344** (0.0347) | 0.0859*** (0.0071) | 0.0560*** (0.0041) | 0.9919* (0.0978) |
| dummy_IPO | | -0.1548*** (0.0015) | | -2.9948* (0.0807) |

Therefore, we can see that various dimensionalities of Chinese venture investment human capital do not have distinct influences on investment performance of the integral standard, and they do not enter the same model. Generally speaking, 1~2 dimensionality exert functions together.

4.2 Strength of the Agency and Investment Environment

The regression result indicates that each scale of Chinese venture investment performance is under the influence of factor variable, i.e., average management capital sum, single project sum and GDP. The improvement of economic standard has activated financial market and brought approaches of venture investment financing, expanding scale and rise of investment forces, which are all reflected in the venture investment performance situation of China in years.

In addition, IPO dummy variable is negatively correlated to IPO withdrawal rate and IPO return rate, indicating that IPO investment environment is especially important to the realization of IPO. However, IPO market does not have distinct influence on performance index and withdrawal rate, because these two indexes include stock right transfer and information of other withdrawal ways, and the fluctuation rate in years is low.

4.3 Robustness Test

In order to test the robustness of regression result, we group the variables and enter the model gradually: educational index, professional background, the number of investment managers and control variable group; working years, professional background and control variable group; multiple regressions of conversion factor variable and specific control variable, regression result coefficient symbol and significance are basically consistent with the above parts.

5. Conclusion, Problems and Policy Suggestions

5.1 Conclusion

This paper takes macroscopic data of venture investment agencies and projects in 8 years between 2006-2013 as the sample and tests the functions of human capital on venture investment performance in the general changing economic environment. Specific conclusions are:

- 1) With economic development and the maturity of venture investment market, the overall strength of venture investment got improved and investment strength improves year by year, which promoted the integral performance of Chinese venture investment distinctly.
- 2) There is positive correlation in different dimensionalities between the improvement of the overall human capital of the management teams of Chinese venture investment teams and the withdrawal of venture investment and return. Because of average data and complicated general economic environment, the functions of human capital is weakened greatly. Among them, influences on financial capital operation are the most significant, and the influence on the number of investment managers is the weakest. Among performance indexes, withdrawal rate is under the least influence of human capital.
- 3) IPO market conditions restrict the performance of IPO project in venture investment performances; likewise, it weakens the influence mechanism of human capital.

5.2 Problems

Since research objects of this thesis is the integral situation of Chinese venture investment, the materials are from investigation and statistics and some data is collected quite late. For example, working years was to 2006 at the earliest, which results to the small number of effective samples. In addition, the scope of surpassing 100% of venture investment accumulated performance is not listed accurately, so only $100\% + \text{group distance of the former group} / 2 = 125\%$ is used as weight, causing decreasing data difference every year. Besides, because of the author's restricted abilities, there are also disadvantages in model operation and result explanations.

5.3 Policy Suggestions

Venture investment agencies should improve the comprehensive qualities of their groups continuously, bring in excellent investment and management personnel actively, enrich the profession as well as the diversity of working experience and the background and take full advantage of the improvement role of human capital to investment performance.

On the premise of continuous development of economic development, besides giving necessary capital support to venture investment industries, related departments also need to formulate relative laws and regulations to strengthen information disclosure, standardize property rights exchange market and complete IPO mechanism, thereby building a healthy external market for the development of venture investment.

References

- Athreya, K., Ionescu, A. F., & Neelakantan, U. (2015). Stock market investment: the role of human capital. *Social Science Electronic Publishing*.
- Bottazzi, Laura, Marco Da Rin & Thomas Hellmann. (2008). Who are the active investors? Evidence from venture capital. *Journal of Financial Economics*, 89, 488-512.
- Chen, G., Yu, X., & Kou, X. (2009). The Underpricing of Venture Capital Backed IPOs: Evidence from Chinese Firms Listed on Different Stock Markets. *Economic Research*, 75-85.
- Cochrane, J. H. (2001). The risk and return of venture capital. *Journal of Financial Economics*, 75(1), 3-52.
- Dimov, D., & Shepherd, D. (2005). Human capital theory and venture capital firms: exploring. *Social Science Electronic Publishing*, 20(1), 1-21.
- Gioielli, S. O., De Carvalho, A. G., & Sampaio, J. O. (2013). Venture capital and earnings management in ipos. *Social Science Electronic Publishing*, 10(4), 30-64.
- Keuschnigg, C., & Nielsen, S. B. (2004). Start-ups, venture capitalists, and the capital gains tax. *Journal of Public Economics*, 88(5), 1011-1042(32).
- Patzelt, H., Knyphausen-Aufseß, D. Z., & Fischer, H. T. (2009). Upper echelons and portfolio strategies of venture capital firms. *Journal of Business Venturing*, 24(6), 558-572.
- Qian, P., & Zhang, W. (2007). Returns on Chinese Venture Capital Investment and Its Determinants. *Economic Research*, (5), 78-90.

- Stromberg, P., & Kaplan, S. N. (2001). Venture capitals as principals: contracting, screening, and monitoring. *American Economic Review*, 91(2), 426-430.
- Wu, C., Wu, S., Cheng, J., & Wang, L. (2012). The Role of Venture Capital in the Investment and Financing Behavior of Listed Companies: Evidence from China. *Economy Research*, (1), 105-119.
- Zarutskie, R. (2010). The role of top management team human capital in venture capital markets: evidence from first-time funds. *Social Science Electronic Publishing*, 25(1), 155–172.
- Zhang, X., & Liao, L. (2011). VCs' Backgrounds, IPO Underpricing and Post-IPO Performance. *Economy Research*, (6), 118-132.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).