The Impact of Venture Capital on Enterprise Innovation: Taking High-end Medical Devices as an Example

Ruichong Li*

Lyme Old Lyme High School, Connecticut,06371,USA

*Corresponding author. Email:2110463041@qq.com

Abstract. Venture capital plays an important role in corporate innovation. The academic community has yet to reach a consensus on the relationship between venture capital and corporate innovation. Existing reviews are limited to qualitative interpretations of the "existence" of relationships, lacking sufficient theoretical and data support to explore the essential reasons and specific impact mechanisms behind the dispute. This article conducts research from two perspectives: venture capital companies and start-up companies. In terms of venture capital, I first briefly introduced the characteristics of venture capital and how to choose start-ups as a venture capital company. and the role of venture capital in transforming enterprises. Secondly, it is about the problems encountered by high-tech start-up companies in their early stages of development and how to solve them and attract investment. Venture capital plays an important role in corporate innovation and is of great significance to the government in formulating effective innovation policies, optimizing the innovation and entrepreneurship environment, and promoting innovative development. The academic community has yet to reach a consensus on the relationship between venture capital and corporate innovation. Existing reviews are limited to qualitative interpretations of the "existence" of relationships, lacking sufficient theoretical and data support to explore the essential reasons and specific impact mechanisms behind the dispute. Through the methods of bibliometrics and literature review, the researchers clarified the development trend of this field from a theoretical perspective and the differentiation trend of research topics. And summarize it from the perspectives of investors and investees.

P. Dou and K. Zhang (eds.), *Proceedings of the 2023 International Conference on Economic Management, Financial Innovation and Public Service (EMFIPS 2023)*, Advances in Economics, Business and Management Research 287,
https://doi.org/10.2991/978-94-6463-441-9_27

Keywords: Venture Capital, Corporate innovation, Medical devices.

1 Introduction

In terms of supporting financing for small and medium-sized enterprises in multi-level capital markets, PE/VC plays an irreplaceable role in supporting innovation and entrepreneurship, especially when PE/VC reaches a certain scale and depth, it is sufficient to promote the growth of the new economy. From the perspective of the future development environment of the domestic capital market, with the promotion of registration system reform and the gradual implementation of differentiated supervision of venture capital, early investment exit channels are expected to be more smooth. This will be conducive to the formation of a closed loop of funds and achieving positive feedback, and also more conducive to promoting a virtuous cycle between early investment, technological innovation, and the real economy.

Chu et al. attempted to verify the direct and indirect effects and transmission mechanisms of venture capital in promoting innovation, and used data from the Science and Technology Innovation Board for verification. Research shows a positive correlation between venture capital and corporate innovation capability [1]. Yi et al. aims to empirically study the impact of venture capital on open innovation in Chinese enterprises, and finds that venture capital can have a significant positive impact [2]. Andrusiv et al. discussed the development trends of global venture capital, compared the effects of venture capital in the European Union and Ukraine, and the results showed that it can play a good promoting role [3].

Wu et al. found that venture capital can not only curb the company's excessive investment in free cash flow, but also increase the company's short-term interest-bearing debt financing and external equity financing, and alleviate the problem of under-investment caused by cash flow shortage to a certain extent. Also, venture capital institutions with different characteristics can play a role in curbing excessive investment in free cash flow, but only venture capital institutions with high shareholding, high reputation, joint investment, or non-state background can significantly improve the external financing environment and alleviate the problem of insufficient investment in cash-short companies [3]. Leogrande et al. Investigated the relationship between venture capital expenditure and innovation in Europe. The results indicate that the expenditure level of venture capitalists is positively correlated with "foreign doctoral students" and "innovation index", and negatively correlated with "government procurement of advanced technology products", "innovators", "exports of medium and high-tech products", and "public-private partnership publications" [4].

Dessi and Yin used one dollar to do research and they found that compared to investing in traditional enterprise walls, it is 3-4 times more effective in motivating innovation. After searching for a lot of information, they found that there were no specific examples to illustrate the impact of venture capital on individual enterprises and innovation [5]. Song and Xu collected data on the technology industry of 28 provinces in China from 2006 to 2009 and found that the innovation rate of the high-tech industry in China is relatively low, but it has been increasing. This indicates that venture capital has a good impact on innovation in high-tech industries. At the same time, it can help improve the structure of the industry and provide some suggestions [6]. Xie et al. sampled cross-sectional samples of A-share listed companies from 2009 to 2015 to study the impact of venture capital on the efficiency of entrepreneurial behavior under government subsidies and conducted an analysis. Venture capitalists can help companies innovate more effectively and invent patents through their professional knowledge, skills, and management experience. Secondly, the effectiveness of venture capital is similar to that of high pubic bone and high sexual desire, as different companies have different characteristics. Venture capital can increase higher-quality innovation [7]. Michael found that the following survey results were obtained by applying two-stage score matching to Austrian microdata to study the impact of venture capital on corporate performance while controlling for industry location and legal status of the true selection benefit of venture capital for companies with high capital potential and the positive effect of venture capital on enterprise growth [8]. Gallowy et al. summarized the impact of the governance structure of 122 youth companies on the combination of corporate alliances and innovation potential. They found that even though the influence of venture capitalists may affect the information strategy of alliances, founders have a higher ability to influence companies supported by venture capital and are more likely to form innovation-focused investments [9]. Wang and Li took the listed companies on the SME Board of China as a sample, descriptive statistical analysis was applied, also use the number of patent applications, the shareholding ratio of venture capital shareholders, and the ratio of R&D investment to operating income of the company were analyzed. Therefore the number of patents applied for by companies with venture capital backgrounds is much higher than that of companies with non-venture capital backgrounds; The independent innovation effect of companies with venture capital backgrounds is quite different, with the largest number of patents applied for annually reaching 119, and some enterprises are zero; The proportion of R&D expenses of companies with venture capital background to their main business income is significantly higher than that of listed companies with non-venture capital background [10].

2 Characteristics of Venture Capital and Its Impact on Innovative Enterprises

2.1 Characteristics of Venture Capital

Generally speaking, the investment targets of venture capital are small and medium-sized enterprises in the entrepreneurial stage, and most of them are high-tech enterprises, such as semiconductors, robots, lasers, and other fields. Under normal circumstances, the investment period of venture capital is at least 5 years, and the investment method is generally equity investment. Through multiple rounds of investment, it usually accounts for about 30% of the equity of the invested enterprise and does not require a controlling stake or any guarantee. or mortgage, which is a riskier type. High risks often require investment decisions to be based on a highly professional and procedural basis, and investors need to have professional knowledge of the industry and market judgment. Some excellent venture investors will also participate in the operation and management of invested companies and provide value-added services, such as product promotion, financing, strategic planning, etc. High-risk investments are accompanied by high returns. When the value of the invested company increases, venture investors will withdraw capital through listing, mergers and acquisitions, or other equity transfers to achieve value-added.

The innovating enterprises generally belong to the sunrise industry or emerging industry. For example, information technology, medical devices, biomedical and genetic engineering, new materials, etc.; Industries with growth potential, such as manufacturing, agriculture, and utilities have certain market development abilities. For example, surgical robots can help doctors to a large extent improve the accuracy of surgery, and reduce doctors' mistakes due to fatigue. Through the stable operation of the robot, they can achieve the advantages of less bleeding and high precision. In recent years, surgical robots have become a popular field of venture capital. According to statistics, from 2017 to 2021, in terms of the number of financings, the trend of financings in the field of surgical robots in my country has increased. The total number of financings was 88, with an average of about 17.6 per year.

2.2 The Role of Venture Capital in Innovative Enterprises

2.2.1 Venture Capital Can Provide the Resources a Business Needs.

Often venture capital institutions have a large number of talent, in the market. These are very good innovation resources for enterprises, and greatly improve the success rate of technological innovation. If an investment company invests in innovative enterprises, more attention will be received in the market, which will lead to more support and promotion. Venture capital can improve the competitiveness of enterprises, and technological innovation is an important means to improve competitiveness in the market. Technological innovation can develop more advanced products and services and improve their quality. With the development of science and technology, innovative technology is particularly important. While innovative technology requires a large number of talents, the talents of enterprises can carry out deeper research with the help of external investment companies to improve the research value and market competitiveness.

2.2.2 Impact on Business Performance.

As venture capital institutions, they have supervisory power and can participate in the management decisions of enterprises. However, according to the current situation, the effect of some venture capital institutions in participating in the decision-making of innovative enterprises is not obvious enough, especially when the direction of innovation has not yet been established. Intervening when it is clear will make the innovation and development of the company more unstable. On the other hand, although venture capital institutions have the right to speak, they may not have a deep enough understanding of the innovation projects engaged in by the company. If they interfere in the company's innovation decision-making for a long time, it will inevitably lead to a negative impact on corporate operating performance.

2.2.3 Influence the Innovation and Development of Enterprises.

Judging from the data currently displayed by many venture capital institutions, the positive effect of venture capital institutions on enterprise innovation is relatively obvious. Enterprise innovation and development is the inevitable way for enterprise growth, and growth requires a large amount of financial support. Venture capital can solve this problem. A large amount of capital is required for corporate innovation. At the same time, corporate employees can be effectively encouraged to innovate in the form of equity to help companies grow rapidly. Occasional direct supervision will also restrict corporate innovation, but the effect is relatively positive. Much smaller.

3 Bottlenecks Encountered in the Development of High-Tech Start-Ups

3.1 Management Issues

Many entrepreneurs may not necessarily be good managers, but they have different abilities. What a company needs most during the entrepreneurial stage is growth. In the face of growth, even other things are unimportant. If you manage chaos, then maybe at this stage, this kind of sacrifice is needed to devote the team's energy to do more important things.

3.2 Rhythm Issue

Start-up companies are meant to move forward quickly. Once they slow down, it means that the company is committing suicide slowly. Others are fast and you are slow. Even if there is growth, it is still a failure. If the processing system is too complete, it means that a lot of resources are spent on the processing system itself, and it is difficult for the team to break through the rules and regulations, and the pace cannot be fast. The process system cannot be completely missing, but it must not be overcorrected. This considers the company founder's ability to deal with this issue and is directly related to his work background. To some extent, it also requires breaking through the limitations of previous thinking.

3.3 Recruitment is Difficult

Nowadays, the requirements for academic qualifications are getting higher and higher, and the talent market is in short supply. Not all companies can recruit candidates for the right positions. This will lead to many startups having good innovation plans at the beginning but not enough talent to implement them, leading to project interruption. Or look for candidates with lower academic qualifications, but risk losing the battle with other innovative companies. Secondly, start-up companies do not have enough influence in the market to attract highly educated talents for employment.

4 Suggestions

4.1 Company Executives Need Reasonable Management and Control of Funds in The Early Stages of Starting a Company.

In the early stages of starting a company, capital control is crucial. Some basic financial management measures can help company executives manage funds reasonably. For example, establish a cash flow usage system to stipulate how cash and banks can be used safely; formulate a budget management plan and calculate the income, expenditure, and balance of funds with your fingers; establish a financial reimbursement system to ensure that every income is received and every expenditure is paid. There is a basis; to establish a warehouse management system to ensure the stability of inventory turnover and cash flow. These measures can help company executives better control their funds.

4.2 Recruitment of Market Talents

4.2.1 Determine Needs.

Clarifying the needs of the startup company, and clarifying the positions and job requirements that need to be recruited. This will help ensure the recruitment process is targeted and efficient.

4.2.2 Create a Recruiting Strategy.

Develop recruitment strategies, including recruitment channels, promotional tools, and recruitment timelines. Consider using multiple channels, such as online recruitment platforms, social media, campus recruitment, etc., to attract a broad pool of talent.

4.2.3 Create an Attractive Brand Image.

Startups often need to demonstrate their traction in a highly competitive talent market. Attract outstanding talents to join us by establishing a positive brand image, highlighting company culture and values, and providing competitive compensation, benefits, and career development opportunities.

4.2.4 Create an Effective Recruiting Process.

Design a concise and efficient recruitment process to ensure that candidates can participate smoothly and receive timely feedback. These include streamlined application procedures, timely scheduling of interviews and assessments, and transparent communication and feedback mechanisms.

4.2.5 Interviews and Assessments.

Develop clear interview indicators and evaluation criteria, and conduct interviews and evaluations based on job requirements and company culture. In addition to skills and experience, attention is also paid to candidates' soft skills such as adaptability, teamwork spirit, and innovative thinking.

4.2.6 Highlight Development Opportunities.

Startups often offer more flexible and challenging work environments, attracting talent interested in growth and development. During the recruitment process, emphasize the company's development prospects, innovative projects, and career advancement opportunities to attract candidates with potential and ambition.

4.2.7 Pay Attention to Culture Matching.

The success of a startup is closely related to team chemistry and cultural fit. During the recruitment process, pay attention to whether the candidate is consistent with the company's values, work atmosphere, and teamwork style to ensure that the candidate can integrate and adapt to the company culture.

4.2.8 Establish a Talent Pool.

Even when there is no specific job demand, it is recommended that startups build a talent pool. This can quickly find the right candidates when needed, saving recruitment time and costs.

Startup companies should consider multiple aspects during the recruitment process to attract and retain outstanding talents and provide strong support for the company's development. Of course, to save recruitment costs or personnel costs, companies can also find many third-party companies in the market to cooperate with to assist in recruitment and reduce corporate pressure.

4.3 Retain and Attract More Investment

4.3.1 Have a Good Business Model.

The first key to successfully attracting investment is to establish a good business model. A good business model refers to a method that allows your company to make profits in the market, rather than simply selling products. Any start-up company needs to have a profitable method, and this method must be carefully considered and researched. When initially designing a business model, you need to ensure that it meets the needs and trends of the current market, while ensuring sustained profitability. If a business model is not scalable or sustainable, the chances of getting investment are greatly reduced. Therefore, a good business model is the key to achieving sustained profitability.

4.3.2 Have a Good Marketing Strategy.

Marketing strategy is another important factor in attracting investors. A good marketing strategy designed by a startup can make investors aware of your company and better understand your product or service. A good marketing strategy can make your company stand out from other competitors and will likely attract more investors.

4.3.3 Understand the Needs and Tastes of Investors.

A successful startup must meet investors' needs for growth and market size. Therefore, entrepreneurs need to study the market and determine the size and growth of their company to better communicate with investors. Based on understanding the needs and tastes of investors, entrepreneurs need to optimize their business models, improve the growth of their companies, and reduce costs to make the company more attractive.

4.3.4 Demonstrate Values and Goals.

Demonstrating value and purpose are key factors in attracting investors. Entrepreneurs should use a simple and intuitive way to introduce the background and experience of their team, as well as the company's characteristics and business advantages so that investors can see the value that their company can provide. At the same time, you must also clearly state your goals so that investors can give you enough understanding and trust.

5 Conclusion

This article studies how venture capital helps start-up companies develop in their early stages and how start-up companies attract investors. Venture capital is a forward-looking investment strategy whose intrinsic motivation is the expectation of high growth and high value-added of the enterprise. Once the investment is successful, venture capital will bring a return of ten times or even a hundred times. High risk, high return: Venture capital fully embodies high risk and high return in the investment process. It mainly invests in companies with great development prospects, but may not necessarily support innovative and high-quality development. Low liquidity: Venture capital is invested in the early stages of a company's establishment, and equity can be realized through the capital market only after the company matures. Therefore, the investment period is longer, usually 4 to 8 years. In addition, when the venture capital finally exits, if the export is not smooth, it will be very difficult to withdraw capital, resulting in reduced liquidity of venture capital. Providing funds and value-added services: Venture capital provides enterprises with large amounts of funds, allowing small and medium-sized enterprises to better carry out technological innovation activities without being restricted by insufficient funds. In addition, the value-added services of venture capital also improve the efficiency of enterprises. Multi-faceted support: Venture capital not only provides funds but also helps companies improve internal governance and provides multi-faceted and multi-level help in finance, management, and strategy. It is the propeller of enterprise growth. In short, venture capital accelerates the transformation of high-tech achievements in high-tech industries, expands industries, and catalyzes the vigorous development of the knowledge economy. This is its most important role. The "catalytic" effect of venture capital on innovative enterprises smoothes the high-level cycle of technology, capital, and industry.

Venture capital plays an important role in innovative companies. Therefore, let's explore the impact of venture capital on corporate innovation and some suggestions. Signaling: Venture capital signals to other stakeholders that the invested enterprise has potential and innovative capabilities. This helps attract more resources and partners. Resource and knowledge flow: Venture capital promotes corporate R&D activities by providing funds and knowledge. This helps speed up the innovation process. Improvement of governance structure: Venture capital institutions can improve corporate governance structure by posting members to the board of directors. This helps ensure that stakeholder interests are balanced, thereby increasing innovation capabilities. Different types of venture capital: Private venture capital focuses on commercialization and efficiency, corporate venture capital supports high-quality and exploratory innovation, and government venture capital acts as a catalyst. In short, venture capital has a positive impact on corporate innovation, but it is necessary to pay attention to the differences in innovation between different types of venture capital. Future research can further explore the impact mechanisms and effects of different venture capital types

References

1. Chu C C, Li Y L, Li S J, et al. Uncertainty, venture capital and entrepreneurial enterprise innovation—Evidence from companies listed on China's GEM[J]. Pacific-Basin Finance Journal, 2021, 68: 101576.
2. Yi R, Wang H, Lyu B, et al. Does venture capital help to promote open innovation practice? Evidence from China[J]. European Journal of Innovation Management, 2023, 26(1): 1-26.
3. Andrusiv U, Kinash I, Cherchata A, et al. Experience and prospects of innovation development venture capital financing[J]. Management Science Letters, 2020, 10(4): 781-788.
4. Leogrande A, Costantiello A, Laureti L. The Impact of Venture Capital Expenditures on Innovation in Europe[J]. Available at SSRN 3930697, 2021.
5. Chen Xin, Chen Demian, Ye Demian. Venture Capital, Spatial Spillover and Heterogeneous Innovation[M].Management Review, 2021.
6. Song Gang, Xu Yong. The Impact of Venture Capital on Innovation Efficiency of High-tech Industries in China[J]. Journal of Northeastern University(Social Science), 2013.

7. Xie Guanghua, Hao Ying, Jin Shufei. The Impact of Venture Capital on the Effectiveness of Government Subsidies in Stimulating Corporate Innovation[J]. Chinese Journal of Management, 2018.
8. Peneder Michael. The Impact of Venture Capital on Innovation Behaviour and Firm Growth[J].WIFO Working Papers, 2010, 12(2):83-107.DOI:10.1080/13691061003643250
9. Tera L.Gallowy Douglas R millier, Arvin Sahaym Jonathan D.Arthurs.Exploring the innovation strategies of young firms: Corporate venture capital and venture capital impact on alliance innovation strategy. Journal of Business Research 2017.
10. WANG Yurong, LI Jun. An Empirical Study on the Impact of Venture Capital on Independent Innovation of SMEs: Based on the Empirical Data of SME Board[J].Journal of Shandong University of Science.Technology(SocialScienceEdition), 2009(01):47-52. DOI:10.3969/j.issn.1008-7699.2009.01.008.