ISSN 2616-5902 Vol. 4, Issue 19: 119-123, DOI: 10.25236/AJBM.2022.041915

Limitations and Innovative Directions of Asset Pricing Theory Applied to Venture Capital

Ning An

Beijing Hua'e Investment Management Co., LTD., Beijing, China
jsanning@163.com

Abstract: *All aspects of the world today have undergone tremendous changes due to the rise in economic capacity and technology, and the impact on venture capital and technological innovation is particularly evident. The rise of venture capital has facilitated technological innovation and made it a key driver of economic development in the world today. The rapid growth of venture capital and technology industries has brought the advantages of economic value to the forefront, but, as the actual situation in venture capital activities cannot be accurately controlled, which leads to some inevitable inapplicability in the application of asset pricing theory. Based on this, this paper takes asset pricing theory and venture capital as the main object of research, analyzes some limitations of asset pricing theory in venture capital, and points out the innovative direction to achieve better development of venture capital. Here, we hope that the research of this paper can contribute to the healthy development of venture capital industry.*

Keywords: *asset pricing theory; venture capital; limitations; innovation Direction*

1. Research Background

Since the beginning of the 20th century, the economy has undergone radical changes on a global scale. The increasing pace of breakthroughs in high-technology industries such as electronics, new energy and aerospace has led to the emergence of a large number of technology-based industries and start-ups in the economy, changing the pattern of global economic growth in various ways. In the new economic model, where the development of technology industries is taking an important place, venture capital, as an "incubator" for high-tech companies, has become even more important in the development of the economic sphere. From the current state of development in the field of social experience, the development of a close relationship between venture capital and technological innovation has played an important role in the progress of economic development, which cannot be ignored. It is thus clear that the rise of venture capital has driven the development of science and technology innovation, thus making it an important driving force that cannot be ignored in the economic development of countries around the world today. Behind the rapid development of venture capital and technology industry, there is a huge financial and economic value of the industry itself, but also hidden dangers caused by the confusion of asset pricing and risk management system in venture investment and financing activities. In this regard, practical research shows that venture capital can not only accelerate the realization of the value of scientific and technological innovation, but also provide many skilled jobs for social development needs and make great contributions to the development of people's livelihood[1].

However, we should also keep in mind the distinctive characteristics of venture capital as a high-risk and high-reward investment. Kor risk discourages social capital, while high returns increase speculative behavior and magnify investment risks, which in turn brings about increased management difficulties and poor exit mechanisms. In this regard, we must correctly identify the risks in real venture capital and make a scientific and reasonable assessment according to the asset pricing theory to increase the success rate of investment and achieve investment returns, so as to fundamentally promote the better development of the venture capital industry.

ISSN 2616-5902 Vol. 4, Issue 19: 119-123, DOI: 10.25236/AJBM.2022.041915

2. Introduction of related subjects involved

2.1 Asset pricing

The so-called top-tier theory of assets refers mainly to the price positioning of assets that will be paid later in a market environment full of unknowns. The price is the price that will be responded to by market supply and demand at market equilibrium. For deterministic markets, the issues concerning the pricing of assets are well established. However, for financial markets, it is not a single factor that is set in stone, but is full of numerous uncertainties, which are then displayed in investments with risky characteristics, in other words the actual trend of asset movements in the future does not coincide with what one expects and has a great variation. Thus, for asset pricing theory, the important point is how to grasp the movements of financial markets.

2.2 Venture Capital

1) The concept of venture capital

The venture capital process usually consists of four stages: financing, investment, management and exit, and these are the main stages that constitute the venture capital and financing cycle. In terms of China's financial market, venture capital is considered an important form of investment and financing, with the following characteristics: the object of investment is mostly new, not successfully listed and underdeveloped, but with great potential for development or unique innovative technology; the investment process will not only provide services for the object of investment, but also include value-added services such as management consulting; in addition, venture capital will have some more The above mentioned characteristics can be fully expressed in the practice of venture capital(Liu, Manhong,&Hu, Bo,2004). In the process of specific venture capital investment, generally speaking, the targets are mostly small and medium-sized potential enterprises with scientific and technological advantages or innovation advantages that are listed on the stock exchange, and accompany the enterprises in the early process of development and progress to achieve rapid growth until they mature, and then obtain high returns by way of equity transfer(Sun Shuhong,2002).

2) The history of venture capital

Venture capital was born in the late nineteenth century in the United States, where some private capital gained higher returns by investing in emerging fields. And then the establishment of the American Research and Development Corporation (ARD) was a landmark event in the birth of the venture capital industry, bringing hope to the small and medium-sized enterprises in the developing American economy. Faced with problems such as financing difficulties of SMEs, they came up with their own unique solution, which was to establish a private institution to attract institutional investors, who in turn invested in SMEs, while providing management services to SMEs. The rapid development of the venture capital industry followed, and more favorable policies were introduced, making venture capital an important form of investment and financing in the U.S. capital market, while also contributing to the growth of the U.S. economy and solving employment-related problems. Eventually, it attracted widespread attention around the world, triggering a scramble to imitate it, and gradually developed and grew globally.

In terms of the development of venture capital in China, it started late and was influenced by the boom in international high-tech and global innovation activities. In general, it has gone through three stages: the first stage was in the mid-1980s, when the central government issued a document to promote the development of science and technology and introduced the concept of "venture capital", and approved the establishment of the China New Technology Venture Capital Corporation. The second stage was mainly in the 1990s, with the pace of China's reform and opening up and the development of market economy, which brought a better policy and legal environment for the venture capital industry, international venture capital institutions began to enter China, and the number of institutions and total capital showed rapid growth. In the third stage, mainly in the 21st century, the government began to gradually guide the participation of private capital in the venture capital industry, expanding the scale of the venture capital market; further improving the regulatory and policy environment, bringing favorable tax policies and other favorable measures for the venture capital industry. In short, China's venture capital industry is with the reform and opening up, the process of building a socialist market economy gradually developed and improved.

ISSN 2616-5902 Vol. 4, Issue 19: 119-123, DOI: 10.25236/AJBM.2022.041915

3. Analysis of the limitations of standard asset pricing theory applied to venture capital

3.1 Differences in the composition of investment subjects lead to inapplicability of utility functions

Asset pricing is closely related to the assumptions of cash flow characteristics of financial assets and investor behavior. In the case of standard asset pricing theory, the most important ideological basis is the expected utility theory, which implies that investors start their investment behavior on the basis of utility maximization. Moreover, assuming that the investor's utility function considers only the trade-off between investment returns and risks, the returns of the security are represented by the mean and the risks are represented by the variance or standard deviation, and also, coupled with the homogeneous characteristics among investors, in this case all investors will have the same view. However, in the real world of venture capital, venture investors are heterogeneous, not only in terms of return-seeking investors, but also in terms of government agencies, research institutions and industry experts, which leads to two important differences from standard asset pricing theory First, the utility function of venture investors does not consider only returns and risks, but has a multi-factor utility function. Second, risk investors have a high degree of heterogeneity due to different resource preservation functions, different investment preferences, different abilities to obtain and process information, and different behavior patterns due to different resource allocation and investment style preferences[2-3].

3.2 The absence of arbitrage mechanism due to the extremely weak replicability of target assets

The condition that arbitrage opportunities do not exist in the market is the basis for setting prices in the absence of arbitrage analysis. Therefore, the use of arbitrage pricing theory is based on the assumption that the cash flow characteristics of the "replicating" asset are the same as those of the replicated asset. In a mature market, some assets can be replicated exactly, and for most assets a strongly replicating portfolio can be found, i.e., cash flows that are not identical but are strongly correlated. These systematic factors include not only market risk, but also macroeconomic risk, political risk, inflation risk, etc., and may even include the effects of some market anomalies, and are therefore to some extent interrelated. However, the correlation of venture capital assets is very low and the arbitrage mechanism is almost non-existent. First, startups generally lack comparable companies, mainly because of their innovative nature, and it is difficult to find companies that are very similar to a given company in terms of technology, products, markets, size and financial performance. Second, even if there are some similar companies, these are unlikely to be at the same stage of development as the target company, and there is generally no market for comparable companies. Third, while all business risks can be classified into five categories-development risk, production risk, market risk, internal risk, and environmental risk-it is not the same set of influences, and each start-up faces unique risks in development, production, and market that have little correlation with each other. As a result, the innovative and unique nature of startups creates a lack of arbitrage mechanisms for risky assets, making the pricing of venture capital assets more complex and difficult to standardize.

3.3 The value of the investment behavior itself is not incorporated into the standard pricing system

Any standard asset pricing model does not take into account the value of the transaction itself, because the value of the asset is an internal and objective variable that does not change because of the transaction itself. But for venture capital, it is more than just a transaction. By providing capital, investment institutions on the one hand market a range of information about the value of a startup, which helps to increase the reputational value of the company and the liquidity of its assets; on the other hand, they integrate all the elements needed for entrepreneurship through their social networks and provide value-added services for the development of the startup after the capital injection, thus significantly increasing the intrinsic value of the startup(Tan Sheng,2008). The process of venture capital and financing is not only about the entrepreneur of the company selling control of the company and a share of revenue distribution to the venture capitalist, but also about its voluntary purchase of venture capital resources and services to increase the likelihood of the company's success. Therefore, both venture capitalists and entrepreneurs must objectively assess the value of these resources and use them as a basis for negotiation. Just as venture capital firms perform due diligence and project evaluation on entrepreneurs and their companies, entrepreneurs have the right to perform the opposite due diligence on venture capital firms to assess the potential investor's ability to contribute to the value of the company and thus have the ability to reverse select.

ISSN 2616-5902 Vol. 4, Issue 19: 119-123, DOI: 10.25236/AJBM.2022.041915

3.4 Dynamic changes in value due to different investment cycles

Asset pricing theory assumes a single investment period for the investment cycle, and investors are faced with the choice of maximizing utility at the end of a single period. Some scholars have conducted research on the multi-stage asset portfolio investment problem, proposing that investors make choices at each stage with a view to maximizing utility at the last stage, but mostly assuming that the rates of return of each period are independent of each other or assuming that the investment behavior of each stage is independent of each other, so that it is still possible to treat the multi-stage investment behavior into multiple single-stage investments. However, in reality, the rates of return of multi-stage investments are not independent of each other. Due to the long investment horizon, phased investment is a common investment approach in venture capital to control risk and reduce information asymmetry. The investment in the later stages is obviously dependent on the investment in the earlier stages. If the effect of the first round of investment is different from the expectation then the venture capitalist has to reassess the value of the enterprise and adjust the subsequent investment decision. Thus, in venture capital, multi-stage investment leads to dynamic changes in firm value and asset pricing theory cannot establish a harmonious relationship with the multi-stage investment behavior in venture capital.

4. Research on the innovation direction of asset pricing theory in venture capital

4.1 Improve the discounted cash flow method

The discounted cash flow method is applicable to more mature venture capital projects, but, as far as reality is concerned, there are two main innovative ways to make the cash flow model more applicable to venture capital. On the one hand, in order to improve the accuracy of cash flow forecasts, it is necessary to choose cash flow indicators that are more in line with the characteristics of venture capital; on the other hand, by identifying and analyzing different risk elements more precisely and by modeling market conditions and business processes more accurately in order to generate better cash flow forecasts(Chen Yibo,2010). More importantly, the accuracy and effectiveness of the discount rate risk adjustment is improved by better combining industry experience and academic theory to produce a more practical and accurate model[4].

4.2 Pricing Unsystematic Risks

By pricing unsystematic risk, we also mean addressing the compensation of returns on risk capital in a proactive local attitude in taking and managing entrepreneurial risk. At the same time, the introduction of business risk factors as part of the discounted cash flow factors in the capital asset pricing model does not depart from the traditional pricing framework, nor does it systematically explain and address the pricing of unsystematic business risks. Therefore, the study of non-systematic risk requires a new pricing idea and framework.

4.3 Establishing a reverse pricing system for the value of venture capital itself

The venture capital financing process is also a two-way value aggregation process. Existing studies have priced venture capital from the perspective of venture capital, without considering the pricing of venture capital from the aspect of venture capital. Venture capital is valued not only in terms of money, but also in terms of information transfer, management synergy and other more important values. In order to establish a framework for valuing startups, a mechanism for valuing venture capital is also needed to allow for more accurate two-way pricing[5].

4.4 Study the relationship between venture capital financing contracts and the value of startups

There is a very close link between venture capital financing contracts and uncertainty in business risk, and changes in contracts can alter the entire asset base and characteristics, and thus the scope of use of the pricing system. Stripping and analyzing the non-standardized elements of contracts and systematically studying the relationship between contracts and investment value will be a key step in improving the scientific practice of pricing venture capital assets(Zhu Dongchen&Yu Jinjin,2003).

ISSN 2616-5902 Vol. 4, Issue 19: 119-123, DOI: 10.25236/AJBM.2022.041915

5. Conclusion

Through the above discussion, we can understand that the rise of venture capital has played a great role in promoting the speed of technological innovation, which in turn has made it occupy an important position in the world economic development. As mentioned earlier, behind the parallel advancement of venture capital and technological innovation, there is a huge financial and economic value and many hidden investment risks. Asset pricing theory has existed for a long time, has a deep theoretical foundation, and is able to give full play to its value in the process of use. However, depending on the reality, if we want to make full and effective use of its utility, we need to innovate and develop it so that it can maintain its important position in venture capital.

References

[1] Liu Manhong, Hu Bo. Venture capital theory: theoretical developments and frontiers of investment process research[J]. International Finance Research, 2004(03):8-14.
[2] Sun Shuhong, "Venture Capital and Financing" [M], University of International Business and Economics Press, 2002.
[3] Tan Sheng. Research on venture capital value assessment [D]. Southwest University of Finance and Economics, 2008.
[4] Chen Yibo. Research on the valuation of enterprises in venture capital [J]. Financial Theory and Practice, 2010(01):64-67.
[5] Zhu Dongchen, Yu Jinjin. On the valuation of venture firms in venture capital--an analysis based on multi-stage compound real options[J]. Scientific Research Management, 2003(04):76-81.