Research on the Matching Degree between Technology-based Micro-enterprises and Crowd-funding Model from the Perspective of Life Cycle

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Abstract

Based on the analysis of the importance of the development of technology-based small and micro enterprises, this paper analyzes the characteristics of technology-based small and micro enterprises from the perspective of life cycle evolution, then it discusses the nature of financing demand in different development stages, and emphatically analyzes the matching degree between the small and micro enterprises of science and technology and the mode of crowd-funding. It points out that the crowd-funding model helps to widen the financing channels, reduce the financing cost and lower the financing threshold of small and micro enterprises of science and technology, that is to say, the construction of crowd-funding model is helpful to solve the financing problem of small and micro enterprises.

Keywords

Technology-based Micro-enterprises; Crowd-funding; Life cycle; High risk

The Importance of Technology-based Micro-enterprises

As the market carrier of high and new technology, science and technology enterprises have become the core of competition in the era of knowledge economy

With the progress of the times and the development of science and technology, the competition among markets, industries and even regions and countries at the present stage is more reflected in the level of science and technology, and the leading and promoting function of science and technology to economic development is more remarkable than ever before, even can cause the fundamental change of social economy. "Science and technology is the first productive force" has become an indisputable fact, vigorously supporting the development of science and technology, promoting the industrialization and marketization of science and

technology is an important channel to strengthen the integration of science and technology and economy. And the industrialization of technology depends on the innovation of science and technology, on the continuous investment and smooth transformation of the main body of the market in science and technology. The small and micro enterprises of science and technology are the most active and most potential group of science and technology innovation in our country, it is the main carrier to promote the transformation of scientific and technological achievements, the important kernel to gather scientific and technological talents and funds to realize enterprise profit, industrial expansion and economic growth, and plays an irreplaceable role in the field of scientific and technological innovation.

The report of the 18th National Congress of the Communist Party of China clearly points out the implementation of "innovation-driven Development Strategy" and "support the development of small and micro enterprises of science and technology" . Small and micro enterprises of science and technology play an important role in the development of national economy and Innovation of Science and technology. At present, the strategic position and guiding role of science and technology innovation in economic development have been paid more and more attention by the state, and it has been regarded as the endogenous driving force to promote economic development. Thus, the industrial transformation and the transformation of the economic growth pattern driven by technological innovation have become a major reform direction and an inevitable trend, the innovation ability of micro-enterprises, which is the best micro-subject of technology innovation, is the weight that can not be ignored in the competition in the era of knowledge economy.

The integration trend of mutual promotion and symbiosis of science, technology and finance has been formed

"Technical Financial Integration" is the final result of continuous innovation of science and technology, expansion of industrial scale and penetration of modern finance into the market, its technology and financial symbiosis, technological innovation and financial development of mutual promotion of the growth mechanism and development of the vein has become the industry and financial consensus. On this basis, the free combination of scientific and technological innovation and financial capital in the market shows a high degree of integration and deep-rooted trend; secondly, as a technology-intensive activity, scientific and technological innovation needs a large amount of capital to support it, this has led to the increasing influence of finance on scientific and technological innovation, and the development and prosperity of finance itself has become an important factor influencing scientific and technological innovation. Thirdly, scientific and technological innovation has also provided the material carrier and supporting space for the development of financial industry, in fact, the realization of modern finance has relied more on the Internet and modern information technology, even if there is no scientific and technological progress there is no so-called modern finance.

"Financial capital" is the most active and innovative factor in the development of modern economy and market, and "capital activity" is actually "the organic combination of technology and finance" , every financial revolution and financial innovation is closely connected with technology. The more prosperous the economy and industry, the higher the stage of development, and the higher the proportion of technology and finance in capital, the higher the degree of Technology and finance integration. That is to say, the modern capital in the

development of modern industrial economy is the external manifestation of the integration of technology and finance.

Small and micro enterprises of science and technology have become the key core to drive economic growth

In December 2014, the China Securities Industry Association issued the "Administrative Measures on private equity crowd-funding (Trial Implementation)(draft for soliciting opinions) " at the same time, and on January 20,2015, it announced the first group of "8 + 1" equity crowd-funding platforms, it indicates that China's equity crowd-funding will gradually move towards legalization and sunshine. The original intention of the creation of crowd-funding is to serve dreams and promote entrepreneurship. Therefore, as a good carrier of innovation, the small and micro enterprises of science and technology should rely on the east wind of the development of crowd-funding at the point of the times when mass entrepreneurship and innovation are strongly advocated in China, as a key driver of economic growth.

For Small and micro enterprises of Science and technology, the unique core resources are the foundation, and technological innovation is an important way to enhance the vitality of enterprises, improve their performance and make them bigger and stronger, the science-and-technology-driven approach to economic development has been proven by many countries. As the most dynamic and creative small and medium-sized enterprises, the role of economic development is self-evident.

However, due to the small scale, less tangible assets and high market risk, the innovative smes have limited financing channels and greatly hindered the survival and development of small and medium-sized enterprises. With the inevitable trend of mutual promotion and symbiosis of financial science and technology, the crowd financing mode that emerges at the right moment provides a new way for the small and medium-sized enterprises of science and technology to get out of the financing predicament. Crowd-funding is highly compatible with the fragmentation, immediacy and high-frequency financing needs of technology-based sees, which helps them break through the barriers of traditional financing models, in order to achieve China's innovation career development by leaps and bounds.

Growth Characteristics of Small and Micro Enterprises of Science and Technology from the Perspective of Life Cycle

Small and micro enterprises of science and technology refers TO THOSE ENGAGED IN R & D, processing, marketing, consulting and service of high-tech and high-value-added products, which have independent intellectual property rights over core technologies, the operating income mainly depends on the sales or service after the transformation of the practice of owning intellectual property, which has obvious cluster characteristics in the development of upstream and downstream industries. At present, the small and micro enterprises of science and technology have become an important hand to promote the transformation of economic structure and the upgrading of industrial structure in China.

According to the Western life cycle theory, the growth stage of scientific and technological enterprises can

be divided into four stages: seed stage, creation stage, growth stage and maturity stage: (1) seed stage: The outstanding performance of this stage is that the enterprises have not yet been established, there is no formal organization form, the enterprise only has the research and development thought and the product tentative plan; (2) the establishment period: In this stage, the enterprise scientific and technological personnel has developed the new product, the product enters the market, but the variety is unitary, the market channel is narrow, the sales income is partial few; (3) growth period: The sales of new products of the enterprise are growing rapidly, the profit of the products is increasing rapidly, the enterprise has certain cash flow and has entered a normal growth and development period; (4) mature period: The product of the enterprise occupies a larger market share at this stage, but no longer has the monopoly, the enterprise's profit tends to the industry's average profit gradually. The outstanding performance of enterprises is organizational innovation, enhancing the ability of technological innovation, and accumulating strength for new products. In these four different stages of growth, technology-based micro and small enterprises exhibit the following characteristics:

More intangible asset, less real assets

In the small and micro enterprises of science and technology, the proportion of intellectual property assets is increasing. It is well known that assets can be divided into tangible assets and intangible asset. The demand of high-tech enterprises for tangible assets such as plant, equipment and raw materials has taken a secondary position, the intellectual property assets such as know-how, trade secret, goodwill, software and integrated circuit play a decisive role in high-tech enterprises. Statistics show that the intellectual property assets of many U. S. technology enterprises have exceeded 60% of the total assets, significantly higher than traditional industries.

Strong willing to innovate

Compared with the General Enterprises, the biggest characteristic of the small and micro enterprises of science and technology is to take the technological innovation as the core, to obtain the technological advantage through the re-combination and the optimized disposition of the production factors. The small and micro-enterprises of science and technology undertake the function of pilot-scale test and industrialization base for the transformation of scientific and technological achievements, and their products have high technological content and high added value, which determines that continuous innovation is the primary characteristic of small and micro-enterprises of science and technology. Small and micro-enterprises of science and technology originated from innovation and grew up in innovation. Their technological level and innovation ability are the key factors.

High growth risk

There are the following risks in the growing process of the hi-tech enterprise: First, the technical risk: The product or service which transforms the hi-tech into reality has the obvious uncertainty, and there is the risk of the loss caused by the technical failure; Second, the risk of infringement of intellectual property rights: Scientific and technological personnel of enterprises invest a lot of money and material resources to acquire technologies and inventions, such as not being protected by law, being imitated and infringed by other

enterprises after being put into the market; Three is the market risk: The enterprise develops the product proliferation speed, the competitive ability existence uncertainty, the existence marketing failure possibility; four is the financial risk: when the enterprise debt financing is excessively many, the financing cost is excessively high, easy to produce financial crisis, the formation of financial risk.

High investment in growth

Compared with the general economic activities of enterprises, small and micro enterprises need to invest a lot of human, material and financial resources to ensure the smooth development of technological innovation activities. High Investment is one of the basic characteristics of high-tech enterprises. The cost of setting up a technology enterprise is generally 10-20 times that of a traditional enterprise. This is mainly due to the high-tech research needs a lot of high-tech, sophisticated, cutting-edge equipment, and in the market and expand market share also needs a lot of capital investment.

Moreover, there is a certain logic relationship between the above-mentioned characteristics of small and micro enterprises of science and technology. Technology-based small and micro enterprises have their intellectual property rights and scientific research achievements, especially in the initial stage of development, so "less real assets, more intangible asset" is its basic characteristics. At the same time, this also leads to the small and micro-enterprises of science and technology can survive only through scientific and technological innovation, "strong innovation will" is its core feature, scientific and technological innovation itself has the characteristics of large investment, high risk, at the same time, once the innovation is successful, therefore, "high investment, high risk, high growth speed" is the derivative feature of "strong innovation will" , and is also the general feature of scientific and technological growth enterprises.

The Stage of Financing Demand of Small and Micro Enterprises of Science and Technology

In the 1990s, American economist Berger and others combined the life cycle of the firm with financing, and developed the financial growth cycle of firms, this theory dynamically reveals the Change Law of capital structure in the process of enterprise growth. It is believed that the changes of enterprise scale and capital demand affect the changes of enterprise financing structure, and different financing arrangements should be made in different stages of enterprise life cycle. In the initial stage, in view of the small scale of its assets, closed financial information and so on, the degree of information opacity is relatively high, because the availability of external financing is very low, the enterprise can only rely on internal financing; as the enterprise grows, the scale gradually expands, the number of mortgage's assets has gradually increased, the transparency of information has improved, and enterprises rely on external sources of financing, such as equity and debt financing; when enterprises enter a mature stage, their financial systems and business records are gradually improved, gradually have access to public equity and debt market financing conditions, when the public equity market after the establishment of sustainable financing channels, the proportion of debt financing gradually decreased, the proportion of equity increased, the scale of enterprises further increased. According to this theory, the size and information of an enterprise are not completely related. With the change of constraints, the financing channel and financing structure of an enterprise will change at different stages of

its growth, therefore, the theory of financial growth cycle explains the Change Law of financing structure of smes from the long-term and dynamic perspective.

Whether it is an institution or an individual, the purpose of investment is to maximize the economic benefits. Therefore, they first consider the risk of the investment object and the input and output of the enterprise. The various stages of the life cycle of small and medium-sized scientific and technological enterprises present different characteristics in terms of risks and benefits, and correspondingly, the capital requirements and sources of funds at each stage of their life cycle, that is, their financing structures are also different.

Characteristics of seed financing demand

The seed stage of a scientific and technological enterprise is the stage of Research and Development (R & D) , at which the enterprise has not yet been formally established. The INNOVATION ACTIVITIES IN THE R & D stage are mainly for scientific and technological personnel to tackle technical problems and realize the transformation of scientific and technological achievements from theory to practice, that is to say, it is feasible to transform the achievements of scientific research into real productive forces through the technical research behavior of scientific and technological personnel. The funds required in this stage are mainly to support the development of scientific research projects, and generally the amount of funds required is not large. However, due to the lack of operating income and high operating risk, it is difficult for enterprises to obtain funds from formal financial institutions, such as w own funds, entrepreneurs self-financing or private investment. It may also be supported by a portion of the government's Innovation Fund. Generally speaking, this stage is faced with the dilemma of a single financing channel, capital is one of the key factors to restrict the success of enterprises.

Characteristics of capital demand during the foundation period

In the founding period, new technology gradually realized commercialization, new technology really used in the process of enterprise production. The main goal of this stage is to achieve the basic survival needs of enterprises by optimizing the allocation of factor resources. Because of the need to continuously expand the size of enterprises, coupled with the majority of small and medium-sized technology enterprises inherent in the high-input characteristics, the number of capital requirements. However, Shanty small and medium-sized technology enterprises have just been established, there are still high risks in products and management, and the survival and profitability of enterprises are relatively weak, and it is difficult to get recognition from financial institutions in the short term, the possibility of obtaining loans from commercial banks is small, the source of funds mainly depends on self-financing, high investment makes it difficult for enterprises to meet the needs of their own funds. At the same time, the Innovation Fund and Incubation Fund set up by the government have provided the important channel of financial support for the establishment of such enterprises.

Characteristics of capital demand in growth period

Through the development of the first two stages, the enterprise has realized the transformation of the

scientific research achievements to the real productive forces and entered the normal growth period. The main task of the enterprise is to cultivate the nuclear capability of the enterprise and improve the market competitive ability of the product, to ensure the healthy, stable and rapid development of enterprises. Solving these problems requires a huge investment, or you risk losing the opportunity for high-speed growth or even stopping it. Although the demand for funds is large, the profitability of enterprises is also gradually increasing, the risks have been greatly reduced compared with the previous two periods, and the sources of funds and financing channels are relatively unobstructed, usually can obtain financial institutions, venture capital and other channels to provide funds, may also be directly through the listing of financing. In order to reduce the cost of capital and improve the income level of equity capital, the financing activities of small and medium-sized enterprises should be focused on optimizing the capital structure.

Characteristics of capital demand in mature period

In this stage, the small and medium-sized science and technology enterprises have taken a large market share in the market, the profit growth rate is gradually stable, the risk is gradually reduced. In the mature stage, the enterprise's profitability is relatively stable, the risk is relatively low, the enterprise obtains the fund from the external becomes relatively easy. At the same time, in the mature stage, enterprises are still facing the pressure of innovation, nurturing new growth points and enterprise transformation, and still need more capital investment. Because the enterprise has stable cash flow and profit, has enough credit ability, the financing ability has been greatly improved, the enterprise needs a wider channel of fund input to meet the enterprise from the external financing demand. Whether has the good financial ecological environment and the capital flow mechanism, affects the science and Technology Small and medium-sized enterprise financing and the enterprise sustainable development.

Analysis on the Matching between Crowd-funding and the Financing of Small and Micro Enterprises

Crowd-funding, which originated in the United States, refers to the internet-based platform, for profit or non-profit purposes, to enterprises or individuals to provide donations and investment in the emerging financing model (Belle flamme, etc. , 2014) . When crowd-funding was born, it was mainly to help cash-strapped artists raise the money they needed from various fields to realize their artistic dreams. As a result of crowdfunding model simple and quick, time-saving, free from geographical restrictions, and gradually expanded to music, art, Film and Television, and many other fields, and committed to enterprise development and innovation (Chen Yang, 2015) . In the past two years, with the government strongly advocating mass entrepreneurship and innovation, micro-entrepreneurship and encouraging "grass-roots" innovation have become the tide of the Times. Many scholars believe that as the product of the symbiosis of science and technology and finance, crowd-funding can overcome the drawbacks in the financing process of small and medium-sized enterprises of science and technology, enrich and expand the multilevel capital market, and revise and optimize the financing path of high-tech small and medium-sized enterprises, in order to support the innovation and development of the real economy.

The emergence of crowd-funding, especially the development of equity crowd-funding for small and micro

enterprises provides a new way to solve the financing difficulties of small and micro enterprises. In recent years, crowd-funding has been favored by many people, because compared with other financing channels, crowd-funding has natural advantages and fit for small and micro technology enterprises.

Widening the financing channels for small and micro enterprises of science and technology type

In the traditional financing channels, small and micro enterprises of science and technology have a rigid demand for internal financing and private capital, but it is difficult to achieve the goal of Enterprise Development and growth only by relying on internal financing, while China's private capital market is not yet perfect, the related laws and regulations are not complete. For Enterprises, not only the capital cost is high, but also the security is difficult to guarantee.

The crowd-funding platform can surmount the obstacle of time and space, has numerous small and medium-sized investors, and can continuously gather the huge "capital pool" , and make up the financing gap of the small and micro enterprises of science and technology. On the other hand, as a public platform, crowd-funding can increase the exposure and attention of investment projects, so that more investors familiar with the participation of technology-based micro-enterprises, thereby increasing the success rate of fund-raising. According to the research of scholars, there is a copycat phenomenon in the field of crowd-funding, that is, when choosing investment projects or enterprises, some investors will refer to and follow the practice of others, once more investors favor the project, other investors (including angels and vs) will follow suit. At the same time, the crowd-funding platform will also help small and micro technology enterprises packaging projects, optimize the program, as an intermediary organization to promote crowd-funding play a substantive role. Therefore, when other traditional financing models are difficult to meet the financing needs of small and micro-enterprises of science and technology, as a beneficial supplement, crowd-funding can enhance the diversity of financing options of small and micro-enterprises of science and technology, and widen the financing channels.

Reduce the cost of financing

According to the China Micro and small Finance Development Report 2014, micro and small enterprises are the least satisfied with financial institutions in terms of loan interest rates and credit lines, and nearly half of the enterprises surveyed believe that financing costs have increased, a whopping 48. 89% think the cost is more than 10% or so, and the cost of private financing is absurdly high. This is the technology-based small and micro-enterprises have no access to borrowing, had to borrow high-interest capital led to the consequences. Venture capital, as a typical representative of the Equity Financing of small and micro-enterprises of science and technology, sometimes acts to the detriment of the invested enterprises, such as taking over the excessively high equity, exploiting and possessing the achievements of the enterprises, the risk and cost of enterprise financing are enlarged invisibly. Compared with the above financing methods, the cost of crowd-funding is obviously lower, and the donation, reward and other methods have no clear return on funds, greatly reducing the repayment pressure of small and micro enterprises of technology.

Under the mode of borrowing and crowd-funding, although it requires regular repayment of capital and interest, the cost of comprehensive financing is much lower than that of bank loans and private financing, only when the enterprise profits will be returned to investors in the form of capital, technology-based small and micro enterprises are also insolvent pressure. Small and micro enterprises of science and technology can choose different crowd-funding models according to their own assets scale, development stage, return mode and other factors. Therefore, for small and micro enterprises of science and technology, crowd-funding is undoubtedly a flexible and convenient financing option.

Lower the financing threshold

Because of the restriction of market financial environment and listing management mechanism, the problem of financing becomes the potential constraint of the development of small and micro enterprises. In the way of direct financing, the threshold for issuing stocks is too high, it is difficult for small and micro enterprises of science and technology to obtain the opportunity of stock listing, and the issue of bonds is difficult to be sought after by investors because the amount of issuance is small. In the way of indirect financing, because of the small size of enterprises 'assets, the difficulty in monitoring and evaluating their credit level and the low survival rate, many financial institutions have turned them away; in the area of venture capital, enterprises need to provide detailed feasibility reports, investment proposals, etc. , but the product or the project of the Enterprise has not yet formed generally, difficult to satisfy the venture investor's rigorous request. However, there is no threshold for crowd-funding in terms of the size and operating income of technology-based small and micro enterprises, as long as technology-based small and micro enterprises publish their projects or technology ideas and descriptions on the Internet, after the check and approval of the crowd-funding platform, we can raise funds for the public investors, and then the public investors will decide whether the financing will be successful, thus more convenient and efficient financing.

It can be seen that the new characteristics of the stage of small and micro-enterprises of science and technology are well matched with the mode of crowd-funding, so different modes of crowd-funding can be constructed according to the characteristics of the needs of different stages: the small and micro-enterprises of science and technology in the seed stage, it is suitable to construct the crowd-funding model of "government lead-vote + follow-vote" , the technology-based small and micro enterprises may be more suitable for the fund-type crowd-funding model in the initial stage, and in the growth stage, the collaborative innovative crowd-funding model will play a better financing effect; In the mature period, it will be a wise choice to construct the network-linked guarantee crowd-funding model.

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