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Research on the Financing System of Sci-tech Enterprises Based on Life Cycle Theory

——Take Huawei as an Example

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Abstract: Science and technology enterprises are an important carrier for our country to implement innovation strategies. The development of science and technology enterprises not only drives the economic growth of our country, but also improves innovation capabilities and provide more employment opportunities, promote the harmony and stability of the entire society, and improves quality and efficiency. Financing is a key factor affecting the success or failure of an enterprise, and it is of great significance to apply different financing strategies at different stages of a technology-based enterprise. On this basis, I will take Huawei as a case study, in order to provide a reference for other technology-based companies to choose financing methods.

Keywords: science and technology enterprise, financing model, life cycle

1. The Characteristics of Various Financing Models

Financing model refers to the way that enterprises raise funds for their own development. Enterprises can raise a large amount of funds through different financing methods to meet the current development of enterprises. There are many ways of financing, which can be long-term or short-term; it can be from internal sources or external sources; it can be obtained directly by enterprises through commercial credit, issuance of bonds or stocks [1]. It can also be obtained indirectly from banks or other institutions. The existing corporate financing models and their characteristics are as follows:

1. Self-financing: The process of funds flowing between holders to make up for the balance includes the inflow of funds (the source of funds) and the outflow of funds (the use of funds).

2. Angel investors: Angel investment is a form of equity capital investment, which refers to individuals or institutions with a certain net wealth that makes early direct investments in start-ups with huge development potential.

3. Commercial Banks: Use commercial banks as intermediaries for financing. At present, this is the main form of indirect financing for logistics enterprises and small& medium-sized enterprises in our country.

4. Commercial finance companies: The financing methods of commercial finance companies are mainly by issuing commercial paper in the money market, and issuing stocks and bonds in the capital market; they also borrow money from banks but with a small proportion. The pooled funds are used

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to lend to consumers and small businesses that buy durable consumer goods and repair their homes. Financial companies are divided into three categories: sales finance companies, consumer finance companies, and industrial and commercial finance companies.

5. Leasing company: The lessee needs to inform the leasing company that the equipment you need will be purchased by the leasing company and then delivered to the lessee for use. However, the lessee must pay the rent regularly as agreed, and neither party can break the contract midway. After the lease time is up, the leased equipment can be disposed of by the lessee, and the lease can be canceled, renewed, or transferred.

6. Private Equity: Invest funds in unlisted equity or listed companies but it's non-publicly traded equity, expedient financing for private and unlisted companies through private placement.

7. Venture capital funds (startup funds): Absorb funds from institutions or individuals in a certain way, then invest in small& medium-sized enterprises and emerging enterprises that have not yet been listed, especially existing national high-tech industries, to pursue high returns in high risks.

8. Buyout Funds: Buyout funds are a vehicle for investors to buy equity in private companies that are not listed on stock exchanges, which usually involves the refinancing of those companies and major structural changes. The crux of a buyout fund is that the company will be acquired by the investors behind the fund, the idea being that the money used for the acquisition will help fund future business activities which are unlike venture capital.

9. Hedge funds: It means a risk-hedged fund. It refers to the financial fund for the purpose of profit after the combination of financial derivatives such as financial futures and financial options with financial organizations.

10. Strategic or Industry Investors: In the field of listed companies in our country, strategic investor is the person who have strong and important strategic resources in the same industry or related industries, seek long-term common strategic interests of mutual coordination and complementarity with listed companies, are willing to hold a large proportion of shares in listed companies for a long time, are willing to and have the ability to conscientiously perform corresponding duties, appoint directors to actually participate in corporate governance, improve the governance level of listed companies, help listed companies to improve the quality and intrinsic value of the company significantly, have a good credit record, and have not been subject to any administrative punishment or criminal investigation by the China Securities Regulatory Commission in the past three years.

2. The Characteristics of Different Development Stages of Enterprises

The theory of enterprise life cycle originated in the 1950s. Haire (1959) was an earlier scholar who studied the enterprise life cycle. He believed that the process of an enterprise from birth to decline and death is similar to the growth law of the biological world [2]. Through the analysis, it is concluded that the enterprise may also have a life cycle, which is similar to the biological life cycle. The life cycle of technology-based enterprises generally includes the seed stage, entrepreneurial stage, growth stage, expansion stage, and maturity stage, and presents different characteristics in different life cycle stages.

1. Seed stage: Enterprises at the seed stage have single operation activities, simple organizational structure, and few employees, so required small amount of capital. And several people in the company may be all the shareholders of the company. At this time, the company only has a few ideas and opinions without substantive products or services. Also there may be zero or even negative growth.

2. Entrepreneurial stage: Enterprises in the start-up period have just been registered and established, and the production of products and other products has gradually started. However, the primary problem of the enterprise is that the management is very arbitrary due to the shortage of funds and lack of a system. However, the form of enterprise property rights was single, and one person held multiple positions and responsibilities at this time [3]. Meanwhile, enterprises will conduct diversion

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and present two states. First, with the continuous expansion of the market and the expansion of the production scale of products, the products and services catered to the market demand at that time, and accumulated sufficient cash flow for production to solve the initial survival problem. The other state is that the company has problems with product quality, the use of market resources, and the supply of funds, so cannot obtain a simple return of production resources from the market which causes the company to go bankrupt due to financial pressure. Enterprises in the start-up period may show zero growth or negative growth or slow positive growth.

3. Growth stage: Enterprises at the growth stage are generally known for their rapid development. When there is a certain amount of capital flow and products and services, enterprises can achieve rapid growth by making more external financing and investment, making more use of liabilities, and exerting financial leverage. Therefore, the asset-liability ratio is usually at a relatively high level in the same industry [4]. But the business risks of enterprises are still relatively large. Moreover, it is difficult to support R&D innovation projects due to the company does not have a mature profit model in the early stage of operation, with less inflow of net cash flow, and a lack of endogenous funds. And because of the limitation of scale and volume, the market's recognition of the competitiveness of enterprises is not high, and investors have a high level of evaluation of their business risks, they will choose a conservative wait-and-see attitude. Accordingly, it is difficult for enterprises to achieve the dynamic linkage of internal and external funds in a short time, but the cash cycle shortens. At the growth stage, the products produced by the enterprise are gradually accepted by society, the production scale is gradually expanded, the technology is increasingly mature, the quality is improved, the governance is constantly standardized, and the market share is gradually increased.

4. Expansion stage. During this period, the scale of product production expanded, and the market share also increased. Compared with the previous three periods, the organizational structure, management system, human resources, technology, and product quality of enterprises have been greatly improved. At the same time, companies will attract a large number of customers to consume and have sufficient capital flow. In this case, there will be two results. If the leaders are organized and well governed, then the business has the opportunity to rapidly advance toward a modern enterprise of scale. In contrast, if the operation fails, the business will go downhill.

5. Maturity stage. Enterprises are expanding steadily at the mature stage. Due to the improvement of enterprises' profitability, corporate reputation, and market share, the problem of endogenous funds has been solved, resource orientation has helped enterprises to attract a large number of new investors, and the constraints of exogenous funds have also been eased. . Under the circumstance that the capital problem is alleviated and the organizational system is improving day by day, the enterprise has a strong willingness to innovate, and its efficiency will be doubled.

3. The Degree of Matching Between Different Financing Models and Enterprise Development Stages

Technology-based enterprises have different financing needs at different stages of the life cycle, they should choose an appropriate financing model according to the financing needs and characteristics of the life cycle stage [5]. The success rate of enterprises at the seed stage is extremely low, only about 10%. Entrepreneurs only have some ideas of their own but no practical actions in the capital chain and products at this time, so they can only undertake the consequence when they lose all their money. But the government will also help some industries [6]. For example, the government may provide a certain amount of start-up capital or help companies make guaranteed loans for the high-tech industry. This kind of funding is the public welfare, and investors such as the government generally do not receive direct benefits from the project. By the way, it may also impress the venture capital institution if the idea and ability of the entrepreneur are particularly outstanding. Such institutions set up special funds for seed-stage enterprises, and they are prepared to lose 90%. If the enterprise operated

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successfully, the investment fund will charge dozens or even hundreds of times as a return. The financing of small and medium enterprises at this stage is equivalent to catching dogs with empty hands, which is particularly difficult.

During the start-up period, the enterprises have carried out preliminary company preparation, product research, and development, production organization, or utilization of market resources, but there is still no complete coordination in terms of personnel, equipment, production, technology, and market resources. Enterprises may be faced with zero growth or negative growth, resulting in the inability to make ends meet, and may go bankrupt at any time. Entrepreneurs normally lack rationality in this aspect, they keep talking enthusiastically to investors about the bright future of the enterprise but ignore all kinds of risks that may lead to the bankruptcy of the enterprise, which leads to an increase in the possibility of entrepreneurial failure. This attitude can only deepen investors' doubts. In a word, entrepreneurial enterprises still rely on the endogenous financing mode that business families to invest in small and medium-sized enterprises. The new financing methods for small and medium-sized enterprises are leasing and private equity.

Enterprises at the growth stage have entered the right track and started to make profits. It has talents, equipment, and management, and products have gained a certain market share and popularity. At this stage, enterprises have increased a variety of alternative financing methods for SMEs and entered the golden stage of financing for SMEs [7]. First of all, enterprises began to have profits that could be used to expand reproduction. This part is the endogenous financing amount of small and medium-sized enterprises, which is transformed from retained profits. It is not too much but significant, and it marks the healthy virtuous circle of enterprise management. It will be highly valued by investors that enterprises have the ability to survive and develop only by endogenous financing of small and medium-sized enterprises. Secondly, as the business has been in operation for a period and has begun to take in a good shape, also the enterprise has a fixed cooperative relationship with suppliers and distributors and got a certain right to speak, the enterprise will have the conditions to accumulate a considerable amount of liquidity by coping with and receiving the upstream and downstream funds in advance, which will play a great role in further expanding the business scale of the enterprise. Similarly, enterprises also have the conditions to obtain bank liquidity payments or medium-and long-term loans through commercial guarantee companies at this stage. Lastly, due to the business risks of enterprises have been greatly reduced at this stage, and the development prospects being limitless, their investment value is far greater than that of mature enterprises. Domestic and international funds will come, resulting in enterprises being chased by "dogs". At this time, enterprises should not be hot-headed but should make careful planning with the help (or introduction) of professionals, so as to avoid entrepreneurial achievements from being lightly taken.

4. Take Huawei as a Case to Analyze the Financing Strategies of Technology-based Enterprises at Different Stages

Nowadays, Huawei is a well-known scientific and technological enterprise in our country and even has a high reputation all over the world. Huawei is at the upstream level in the world in terms of technology and market share [8]. This is inseparable from the financing strategy chosen by Huawei at the early stage, so it is a very typical case to analyze the financing strategy of Huawei as a technology-based enterprise. First of all, Huawei has extremely high technical requirements for the communication industry and electronic products industry and is faced with competitive pressure from various domestic and foreign technology-based enterprises at the start-up stage. R&D requires enterprises to invest a lot of money and the risk is still very high. Huawei can overcome all these difficulties shows that Huawei has successful financing methods and channels, which bring the enterprise enough funds to carry out technology research and development and market development. Secondly, there is no deep-rooted sponsorship or consortium behind Huawei, however, Huawei has

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customized the financing strategy for the company by making full use of the characteristics of the industry and its own resources, combined with the company's existing capital needs, strategic orientation and the life cycle of the enterprise in which it is located.

4.1. Financing Strategy and Characteristics of Huawei Company at Seed Stage

Huawei was first established in 1987. At the beginning of its establishment, its main business was to act as an agent for a Hong Kong company to sell in Shenzhen. From 1988-1989, Huawei gradually established a sales network, began to assemble the PBX by purchasing parts, and sold the assembled products to the market. At that time, the founder of the company found that there was a very large market demand in this field, but the company could not purchase enough spare parts all the time. Therefore, the company's leaders and shareholders decided to start research and development on larger switches in order to continue the normal operation of the company, and they launched the market for recognition successfully. Huawei is a small company at the seed stage, and it faces high operational risks as a newly-built technology-based enterprise. Although the funding gap is large, it can't get financing. And at that time, there was no such idea as angel investment in the Chinese market. In 1992, the People's Bank of China announced that it would control the loan quota of commercial banks. The implementation of this policy has led to a sharp decline in the scale of credit, and most enterprises and industries have suffered serious losses as well as Huawei, which not only has a serious funding gap but also cannot get loans from commercial banks. All in all, Huawei was small and with high operational risks at that time, the small funding gap was an important factor hindering the company's development.

The first strategy chosen by Huawei is endogenous financing. When the company was founded, the registered capital was only 20,000 yuan, and the company made a certain profit by selling the switches of a company in Hong Kong as an agent. It is said that Shenzhen plays an important role in the China Electronics market, it will have certain economic benefits as long as it sells electronic products in Shenzhen. Through endogenous financing, the founder reinvests the profits obtained in the company for reproduction. The second method is internal equity financing. Huawei established the employee stock ownership system in 1990. Internal equity financing does not need to pay fixed interest, and there will be no heavy financial burden on the company. At the same time, there is no need to pay equity interest to shareholders on a regular basis. Employees of the company are also equivalent to shareholders in the company, which can also mobilize their motivation to create benefits for the company.

The third method is external financing. The founder of Huawei started to borrow money everywhere, but Huawei was too small at that time to establish its own reputation and image in the market, and it didn't have enough assets as collateral. In this situation, enterprises can only resort to private lending. But the disadvantage is that the interest rate of private lending is very high, as high as 24% or even 30%. After Huawei adopted the innovative financing method, all aspects of the company have undergone good changes, including technical capability, the number of employees, and so on. Within five years, the revenue growth of the company's main business has far exceeded the average level of the same industry, reaching more than 100 times.

4.2. The Financing Strategy and Characteristics of Huawei During the Start-up Period

In 1994, Huawei's development was hindered to some extent, and the company even owed half a year's salary to its employees. Although the scale of the enterprise is gradually expanding, there are management problems within the company and the employee is seriously insufficient. Until the end of 1996, the company successfully developed the first STP testing machine, which greatly increased its reputation of the company and had a certain influence on the communication industry.

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The first financing strategy adopted by Huawei in this period was to set up a joint venture company. There was a serious funding gap at that time. In order to solve this problem, the company began to seek cooperation with other partners. After Maubec Company and Railway Company, Huawei has established 27 joint ventures nationwide. In addition, the buyer's credit for communication equipment has also contributed to the development of the company. Most of Huawei's products are sold by large telecom operators, normally such operators need to purchase a large number of pieces of equipment with a large amount of money but had a long collection period, which leads to a long period of return on investment and adversely affects the company's operation. Faced with this situation, Huawei began to explore credit with commercial banks, hoping to ensure normal operation and provide more funds to the company. In June 1996, Zhu Rongji, Vice Premier of the State Council, proposed that banks must provide buyer's credit support to this kind of enterprise if they want to enter the international market after learning there were big financing difficulties in this enterprise when he did inspecting. In the second half of 1996, China Merchants Bank began to provide buyer's credit business to this company. After that, the company's sales revenue continued to increase and its development speed continued to rise. Not only expanding its domestic market scale but also opening up a broad international market. The last one is internal equity financing, using the seed period method will make more profits and then can use for investment. After the start-up period, the company's income increased substantially. By the end of 1997, the average net profit of the industry reached 1/3 of the company's profit of that year, which shows that the company's financing strategy did make an important contribution to the company's development at the initial stage.

4.3. Financing Strategy and Characteristics of Huawei During Growth Period

At the beginning of this century, the whole market was punctured by the Internet bubble, which impacted the speed of economic growth and greatly reduced the scale of credit. Enterprises are facing serious financing difficulties again. The company decided to start developing the international market, however, it also requires a lot of capital investment. At the same time, internal employees of the enterprise begin to neglect or even some core technical personnel choose other enterprises. The impact of SARS in 2002 hit the whole communication industry. Huawei lost a large number of overseas markets, and its revenue began to show negative growth for the first time. The strategy chosen is especially important at this time, otherwise, the whole company will face bankruptcy or bankruptcy liquidation. Huawei began to sell non-core assets and exchange technology for capital. The cost of R&D in China is generally low, Huawei taking advantage of this feature to recruit a large number of R&D staff to help the company sell non-core assets. First of all, Huawei strengthens the research and development of the main business constantly and launches more new products with non-core technologies at the same time. After a certain sales scale, we can obtain funds by selling the non-core business to the outside world. Therefore, Huawei's capital chain has not been greatly affected. The second strategy is to cooperate with banks to innovate financing mechanisms. Overseas financing has higher risks and complicated interests. After a long period of investigation, Huawei's capital demand shows the following three characteristics: high efficiency, large amount, and long term. China Development Bank has created exclusive credit products based on the actual needs of the company Huawei. Winning the support of the state, also strengthened the confidence of all employees and leaders of Huawei. The last one is equity incentive. As virtually restricted equity, although it has no voting rights and ownership, it can get stock appreciation and dividends, and it can't be sold at the same time. The main purpose is to reduce the internal contradictions of the company, and the employee stock ownership has been replaced by stock options, and they only need to pay 15% of the stock options fee. After changing the financing strategy, the company's sales revenue increased further. In 2007, the company's net profit reached six times that of the whole industry.

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5. Conclusion

Capital is the basis for the development and operation of an enterprise. If an enterprise wants to operate in a healthy, long-term and stable way, it must have sufficient capital, perfect management system and profit model. With the continuous development and gradual improvement of China's market, enterprise financing methods and financing channels are rich and diverse. In the start-up stage, the best financing method for enterprises is equity financing, and they seek financing through angel fund investors, governments or venture capital institutions; During the growth period, enterprises can raise funds by means of debt financing reduce financing cost and relieve financing pressure; Mature enterprises have various financing methods, and they can choose endogenous financing, debt financing, equity financing, etc. according to their development; In the recession, enterprises can raise funds for new development direction by using retained earnings or debt and other financing methods. Enterprises in different periods should choose financing methods suitable for their own development in order to bring stable and healthy development to enterprises.

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