

# Research on the Financial Service Platform of Regional Science and Technology Based on Investment Loan Linkage Mode

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**Abstract:** *Investment loan linkage of commercial banks as a new business model, provide a new financing channel for SMEs. Firstly, through the analysis of the innovation type enterprise financing present situation, think branch enterprises financing difficulties are the following three points: one is the high transaction costs; two is the commercial bank equity investment limited risk coverage cannot be carried out; the three is the information asymmetry between banks and enterprises become the main cause; and then through the analysis of "investment loan linkage" mode, the regional science and technology financial service platform construction based on the model; then from the perspective of platform elements discussed "the application of science and technology investment loan linkage in financial services platform and operation process; finally, starting from the perspective of financial services technology platform, pointed out that the main problems should be concerned about the process of using the model in investment loan linkage.*

**Keywords:** Investment loan linkage; Technology Finance; Regional science and technology financial service platform; Fintech

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## 1. Introduction

Since the Chinese economy entered the new normal in 2011, the economic growth has declined, and the difficulty of industrial transformation and upgrading has become the main problem that affects the speed of economic reform. The development of SMEs is even more difficult, although in recent years, the central bank to cut interest rates several times, drop as much as possible to help enterprises reduce the cost of corporate financing, but because the SMEs in the capital structure, risk management and other aspects of traditional financial services model is difficult to effectively match, financing difficulties, financing expensive branch enterprises the problem is still outstanding. At present, equity financing has become the main mode of financing by enterprises, but China's commercial banks are not directly on the SMEs equity investment, in March 2015, the State Council issued "some opinions on deepening the reform of institutional mechanism and speeding up the implementation of innovation driven development strategy " twelfth clearly pointed out that commercial banks to improve the relevant laws, selection the banking financial institutions to meet the conditions, explore the way of financing services that provide a combination of equity and creditor's rights for SEMs and with venture capital, equity investment institutions achieve investment loan linkage. Commercial banks thus ushered in new opportunities in enterprise financing road branch.

You Daming defined a regional financial services technology platform as "to the regional economy as the foundation, the formation of aggregates is guided by the government including banking institutions, risk investment institutions, Guarantee Corporation, industry associations, science and Technology Park and professional financing intermediary mechanism, providing venture capital, loan

guarantees, for the high-tech enterprises in the region of capital financing, the introduction of strategic investors and listed financing (PE) series of professional financial services, to solve the problem of high tech enterprises financing difficulties, promote the effective combination of technology and finance in the region, and ultimately achieve a comprehensive development of regional economy and society." The lack of related research of current science and technology financial services platform and the combination of investment and loans linked mode. Therefore, study on the combination of the two not only enrich the development mode of science and technology financial services platform, also provides a new way to solve the problem of financing by enterprises.

## 2. Literature Study

With the deepening of the research of science and technology finance, how to improve the combination efficiency of science and technology finance becomes a hot research topic. In the case of small demand for funds, Shu Jun Yi believes that with the help of Internet, a new technology financial service platform based on public fundraising will be built to help start-ups raise funds and become a new effective financing mode for many new businesses. Huang Yan believes that the financial services technology platform is a set of policies, products, intermediary, information services and other comprehensive financial service, according to the different stages of the development of SME financing demand and financing conditions, the government funds as a guide, science and technology play the advantages of integrated services, the integration of Bank guarantees, insurance, venture capital and other resources, through the collection small and medium-sized enterprises and integrated innovation of financial products, to provide one-stop, personalized

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services for SME financing. Jiang Anyin and Liu Xiaowei believe that the development of Internet Finance forces the commercial banks to continuously innovate the scope of financial products and services. The financing of science and technology enterprises is more convenient and efficient, and the flow of funds is more free and flexible. Under this background, the operation mode of regional science and technology finance integrated service platform needs to be innovating continuously.

As the innovation of science and technology finance, the mode of "investment and loan linkage" can further promote the development of science and technology innovation. Bu xiangrui defined the loan linkage as, " commercial banks and investment institutions such as PE, VC and other investment institutions determine the cooperative relationship by agreement, on the basis for evaluation and investment of enterprises in investment institutions, commercial banks and risk investment institutions to "equity + debt financing" mode of investment on the enterprise, to form a linkage between equity investment and financing mode of bank credit, to support the innovation and development of enterprise innovation. Lu Minfeng and Lu Shun pointed out, the traditional credit model of commercial Banks is difficult to provide efficient financial resources for the innovative enterprises, but the invest loan linkage provide feasibility for commercial bank to service SEMs. It is the beneficial innovation of commercial bank credit model. Shu Langen said: "for reference to the U.S. Silicon Valley banking business model, to explore the establishment of a technical and financial specialized agency in the organizational structure of commercial Banks., to build 'Technology + Finance ' service platform is the preferred scheme to solve the problem of financing in our country. At present, the research of scientific and Technological financial service platform in China mainly focuses on the main body, function, operation mechanism and policy suggestion of the platform, and the mainstream research view on the linkage model of investment and loan is the problems faced by commercial banks in developing this model. Most of the domestic science and technology financial services platform by the government-led construction, for the investment and lending linkage of this new technology and financial services model has not been involved. This paper studies the application of the investment and loan linkage mode in the construction of sci-tech financial service platform, enhances the combination efficiency of science and technology finance, and gives full play to the application of the investment-loan linkage mode in solving the problem of financing of the SEMs.

### **3. The Present Situation and Reason of Financing of the Science and Innovation Enterprise**

**3.1 The status quo of the financing of science and innovation enterprises.**

#### **1) Smaller, Banks are reluctant to lend**

In the early stage of development, most of the science and

innovation enterprises in China have many problems, such as small operation scale, poor ability of resisting risk, lack of core competitiveness, confusion of internal governance structure and imperfect information disclosure. Banks and other financial institutions in the face of SEMs to finance, want to fully grasp the business situation and development prospects need to pay high cost of information search. Therefore, in the face of high-risk, low return of the science and innovation enterprises financing, most commercial banks will hold "cherish the loan" attitude.

#### **2) Lack of perfect credit guarantee system**

on the subject of the enterprise itself, less fixed assets, some branches of the enterprise system is not sound, risk control capacity is insufficient, lead to lower corporate credit rating, at the same time, because of the enterprise's own credit degree and the bank's restriction to its loan, the credit institutions that can provide guarantee are further reduced, which leads to the difficulty of credit evaluation of the science and innovation enterprises.

#### **3) High cost of financing**

In the finance structure of the Branch innovation Enterprise, most of the enterprises ' financing cost is higher because of the unreasonable financing structure. Reasonable debt financing and equity financing can directly reduce the cost of enterprise financing, banks and the private interest of higher loans, undoubtedly increased the financing burden of enterprises, the development of enterprises adversely affected.

#### **4) Narrow financing Channels**

The finance of the science and innovation enterprises concentrates more on the indirect financing from the bank, and only a few of the financing comes from direct financing. In China, the conditions of listing and financing of enterprises are higher, the generalthe science and innovation enterprises are difficult to meet the standards of listing, while the science and innovation enterprises own funds relatively scarce, restricting the development of the enterprise. According to the survey, bank loans accounted for the 98.6% in the financing supply of the enterprises, while the direct financing accounted for the 1.4%. The American the science and innovation enterprises direct financing to occupy the 19%.

### **3.2 The reasons for the difficulty of financing**

#### **1) High Transaction Cost**

The cost of obtaining information between each other is higher because of the direct contact between the science and innovation enterprise, the guarantee organization and the commercial bank, and the less frequent economic intercourse. At the same time, there is a strong heterogeneity between financial institutions and guarantee institutions, and the cost of loan and guarantee is very high. In the face of so many loans and loans, Banks generally adopt the practice of "making good loans rather than lending".

**2) Restriction of equity investment in commercial banks**

China's Commercial Banks Act 43rd expressly stipulates that "commercial banks shall not engage in trust investment and securities business in the territory of the People's Republic of China, and shall not invest in, or invest in, non-bank financial institutions or enterprises, except as otherwise provided by the state." because of the existence of this law, commercial banks can only carry on the creditor's rights investment, the commercial bank's profit can only come from the enterprise's debt interest, for the high-tech enterprises with high risk, the bank loans to the company is not worth the loss. It is impossible to obtain high returns through equity investment so as to carry out risk coverage so that commercial Banks can reduce their enthusiasm for the loan of science and innovation enterprises.

**3) Asymmetric information**

The main reason for the difficulty of financing is the asymmetric information between banks and enterprises and the adverse selection and moral hazard. In the credit market, the science and innovation enterprise to understand the enterprise's own business situation better than the financial institution, is in the information superiority. Financial institutions to reduce this information asymmetry, which will increase the audit of branch enterprises, make the transaction cost increase, at the same time, the bank is based on the risk consideration, also will be cautious to the science and innovation enterprise's loan application, thus to the science and innovation enterprise's audit request will be more rigorous, causes the enterprise financing difficulty, the financing approval time is too long.

**4. Construction of Sci-tech financial service platform under the mode of investment and loan linkage**

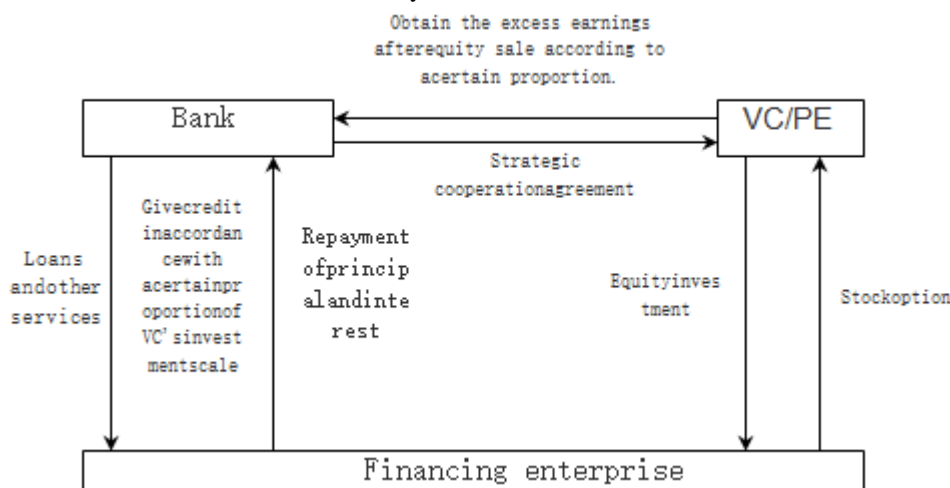
**4.1. The concept and category of linkage mode**

The investment and loan linkage in the century era originated in the United States. The so-called investment and loan linkage, generalization is defined as the combination of "credit" and "equity financing", in which credit is mainly completed by commercial banks, and the main body of

equity financing is different according to different operation modes of investment and loan linkage, and there are common external venture capital institutions (VC/PE), the Commercial bank group has the investment qualifications the subsidiary company, the Industrial Investment fund and so on. On April 21, 2016, the China banking regulatory commission, the ministry of science and technology and the people's bank of China jointly issued "about support banking financial institutions to strengthen innovation in the science and innovation enterprise investment and loan linkage pilot guidance", The definition of the linkage between investment and lending is defined as: the banking financial institutions combine the "credit" with the "equity investment" of the subsidiary companies with the investment function set up by the group, through the relevant institutional arrangements, cover the credit risk by the investment income and realize the matching of credit risk and income of the Branch enterprise. For the science and innovation enterprises to provide sustainable financing model.

According to the relevant provisions of the Commercial Bank law, commercial banks can not directly carry out equity investment, only through third-party carriers to complete the process of enterprise equity investment, according to the different Third-party carriers, the investment and loan linkage could be divided into three business models.

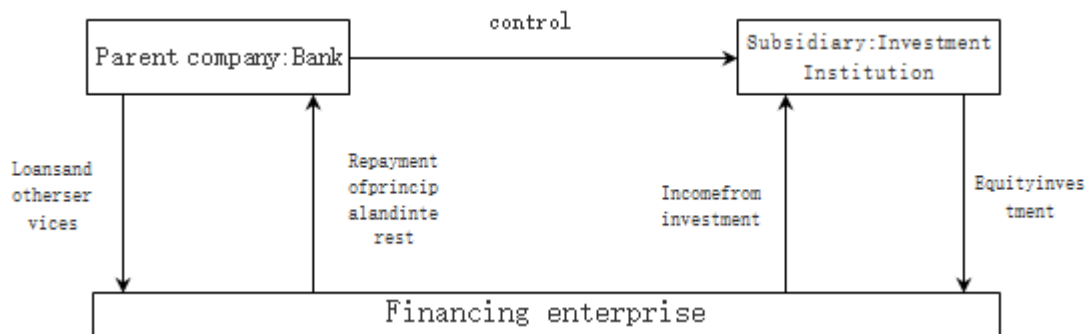
First, the "bank +vc/pe" mode. The initial cooperation between banks and venture capital institutions is mainly based on the mode of investment and loan linkage, that is, the banks, according to their own risk preferences, sign strategic cooperation agreements with some equity investment institutions, and follow and appropriately intervene in the enterprises recommended by the cooperation agencies, Establishing information sharing with equity investment institutions, risk-sharing mechanism, for the equity investment institutions have invested in enterprises, to give a certain proportion of loans and related financial products support, while locking the investment enterprises including consultancy services, future ancillary business and capital settlement and other comprehensive business, to realize the combination of equity and creditor's rights.



**Figure 1: Bank +vc/pe mode**

The second is "bank + subsidiary" mode. The commercial bank establishes the equity investment organization, recommends the high quality customer to carry on the equity investment, according to the customer different development stage to provide the corresponding loan and other service product support, promotes the bank

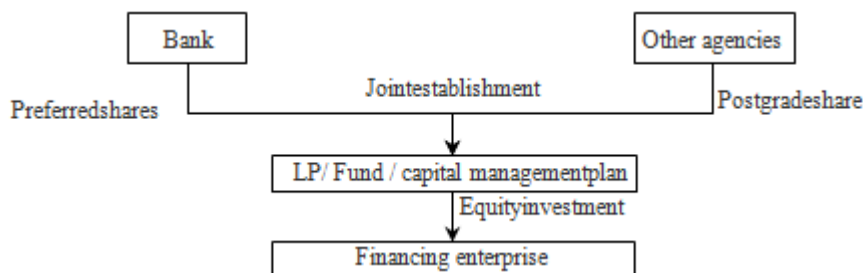
comprehensive financial service level. In this mode, because the subsidiary belongs to the internal organization of the bank group, the decision-making chain is shortened, the communication cost is reduced, and the group integrated operation has obvious advantages.



**Figure 2: Bank + affiliate mode**

The third is "bank + other organization" mode. Commercial banks and other institutions (such as asset management companies) jointly initiate the establishment of a limited partnership (LP)/ Equity Investment Fund / Asset Management plan, and then by virtue of the Equity Investment Fund platform External Equity investment.

Finally realize the investment and loan linkage. Of these, commercial banks hold the priority share of the Fund's / Capital Management plan with credit funds or financial funds, and other institutions, as managers, hold the inferior share of the Fund's / Capital control plan

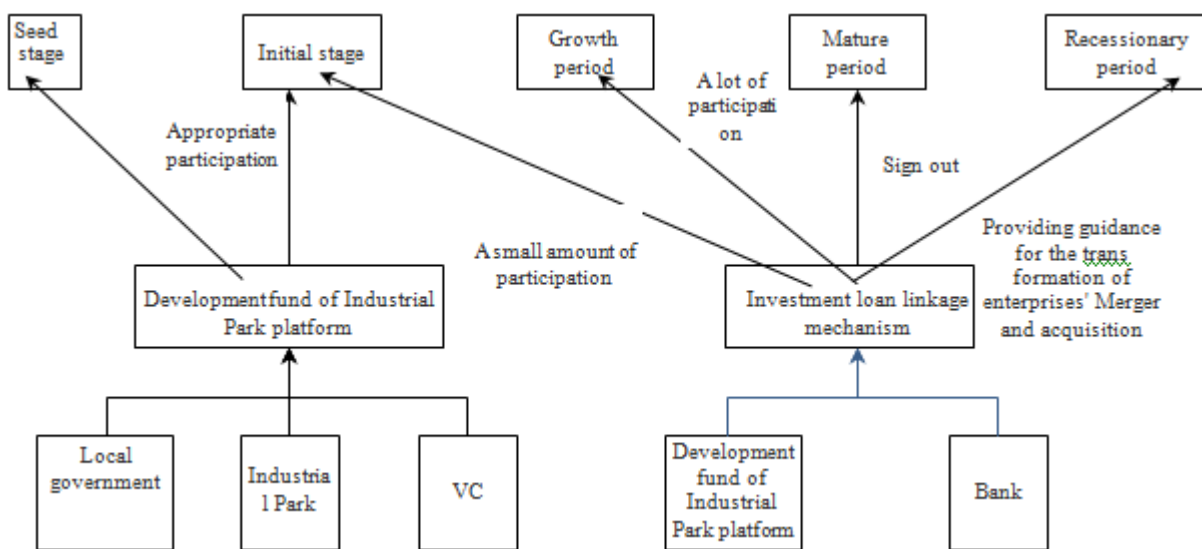


**Figure 3: Bank + Other institutions mode**

**4.2 Construction of the investment-loan linkage model of regional sci-tech financial platform**

Cai (2016) one in its research, combining the life cycle theory of small and medium-sized enterprises, based on the

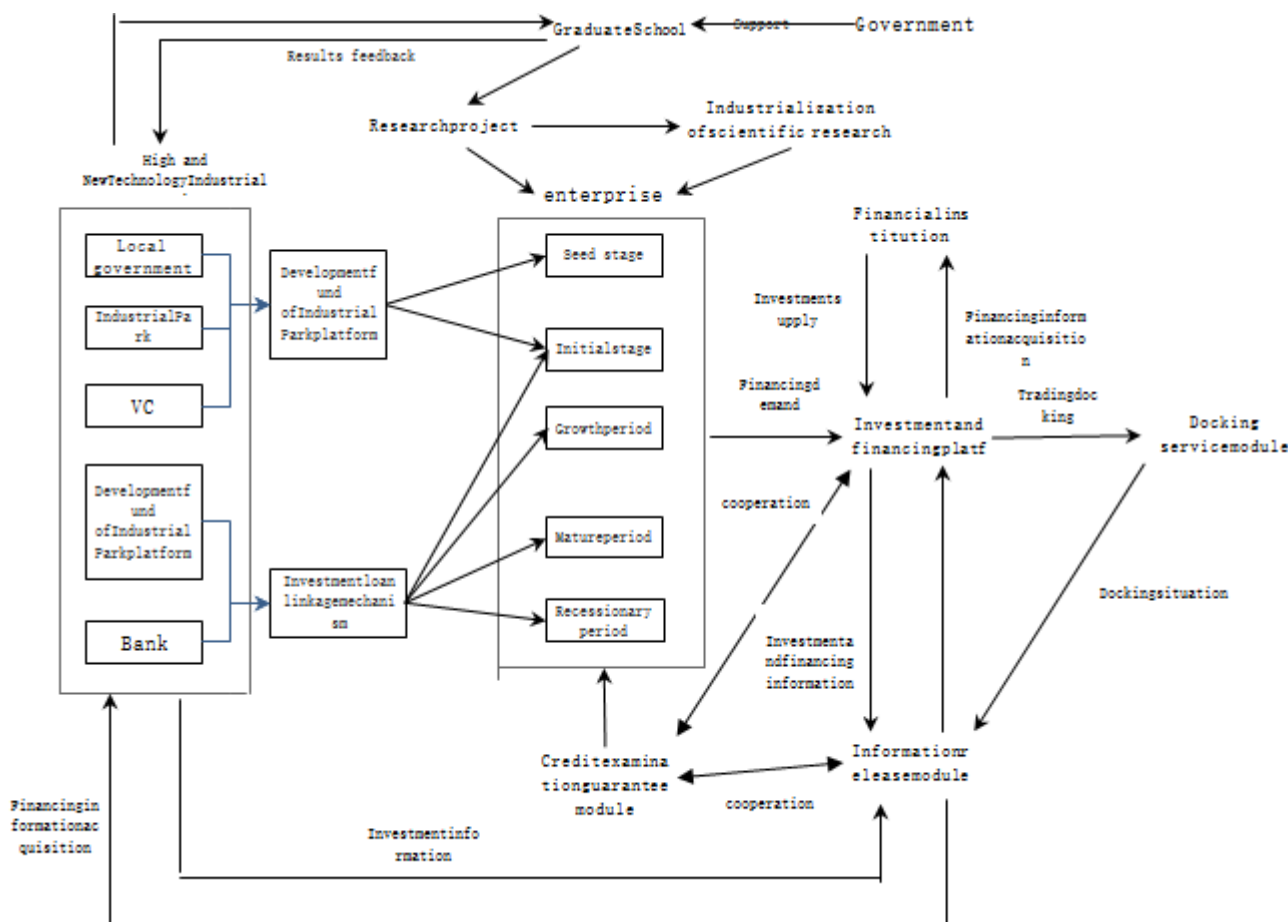
investment and loan linkage business, designed a professional investment and loan linkage product system. See figure 4



**Figure 4: Investment and loan linkage" product system**

Through establishing the linkage mechanism between the commercial bank and the industrial park, the linkage between the equity investment and the bank credit is formed, which effectively alleviates the information asymmetry between the enterprise and the bank and reduces the transaction cost. On the basis of the former research, through the combination of bank investment and loan linkage mode and regional science and technology financial

service platform, we can fully mobilize social leisure capital, widen the financing channel of science and technology enterprise and perfect the credit guarantee system of the Science and technology enterprise. Design of the investment and loan linkage mode in the technology and financial Services Platform application framework, as shown in Figure 5



**Figure 5:** Application framework of investment and loan linkage mode in sci-tech financial service platform

**(1) Financing party**

In this paper, the financing side mainly for the science and technology SMEs, according to the enterprise life cycle theory, the SME development stage is divided into seed stage, start-up period, into long-term, mature, recession period, of which the seed period and start-up period of the enterprise due to the uncertainty of the future development and high risk, Therefore, the main source of financing are endogenous financing and policy-enabling High-tech Industrial Park Platform Development Fund, in the growth period, maturity of the enterprise development more mature and stable, at this time is in a large number of financing, opening up the market stage, bank loans relatively easy, the enterprise can obtain commercial bank and park platform development fund investment according to the mode of investment and loan linkage. In the recession, enterprises can use the guidance of the industrial park to help them realize the transformation of enterprises or seek other financing channels. In the whole life cycle of enterprises, in addition to the use of industrial park to obtain development funds, enterprises can also through the scientific and

technological financial services platform to seek other social investment, broaden the source of enterprise financing, improve the scientific and technological SMEs inventory probability.

**(2) Investment Party**

The investors in the technology financial service platform are mainly large and medium-sized enterprises, Non-bank Financial institutions (venture capital, insurance, microfinance companies, financial leasing, etc.), commercial banks and social investors. The commercial banks mainly through the way of investment and loan linkage to the science and technology enterprise to provide funds, other investors such as Non-bank financial institutions, with a large number of idle capital of large and medium-sized enterprises and social investors, these investors can through the scientific and technological financial services platform to learn more about the industrial park in the various enterprises, Identify quality investment projects to invest or to understand the investment trends of other professional investment institutions to participate in

the financing process of enterprises in the future.

### **(3) Investment and financing platform**

The main function of the investment and financing platform is to audit and supervise the financing projects of the financing enterprises. To safeguard the interests of the investors, and to integrate the financing needs of the financiers and the investment needs of the investors, through the construction of the database, through large data matching and other ways to meet the requirements of the investment and financing parties, to reduce the time cost of investors looking for investment projects, also enhance the financing enterprises to obtain investment opportunities, to facilitate the transaction willingness of the two parties, to prepare for the next step of offline negotiation.

Financing parties that fail to obtain effective matching objects can be released to the information advisory module through the investment and financing platform. Through information such as public financing and enterprise operation status, the information asymmetry in the enterprise financing process is reduced, so as to facilitate investors to find high-quality investment projects, and to minimize the embarrassing situation that no investors can venture to invest.

### **(4) Docking service module**

After the two sides have reached a preliminary intention to deal with the transaction, they enter the docking service module, which provides services for both the investment and financing parties to ensure smooth transaction.

After the success of the enterprise financing, the financing information and the use of funds will be released to the information consultation module, so as to ensure the transparency of the use of enterprise funds and provide references for other investors to provide corporate financing status, so as to facilitate the subsequent financing of enterprises. If corporate financing fails, investors can not reach a financing transaction, and the reasons for corporate financing needs and past number of financing failures will be released to the information consultation module again, so as to find other investors to invest again.

### **(5) Information module**

Information module is the foundation of Science and Technology financial Information Service platform, it connects each module of the whole science and Technology financial Information Service platform system organically, including government policy information, enterprise financing demand, investor's investment demand, enterprise credit rating, enterprise guarantee, enterprise financing success or not, the situation of industrial park investment and loan linkage mode.

The investment in the mode of investment and loan of industrial park is released to the technology financial information service platform through this module, so that the broad masses of investors can understand the enterprise financing situation in real time, and decide whether to

participate in the future financing process of the enterprise. The industrial park also can obtain the enterprise financing information from this module, thus discovers the quality investment project to carry on the investment.

This module realizes the effective linkage between industrial park and social capital by realizing all kinds of information transparency, sharing, reducing information asymmetry, changing the information environment of the science and technology enterprise.

### **(6) Credit Review guarantee module**

Credit Audit guarantee module includes Trust Company, insurance company, credit rating agency, accounting firm and other institutions. Before publishing the financing demand to the science and Technology financial Information Service platform, the enterprise should submit the basic data to the module for review and decide whether to allow the enterprise to release the financing demand according to the examination result. If the enterprise needs guarantee service, the module can obtain various kinds of financing information from the information Service platform through cooperation with investment and financing platform and information module, and decide whether to provide guarantee service for the enterprise.

At the same time, the examination of the business status of the enterprise, credit rating information and guarantee information will also be published along with the information of the enterprise financing requirements to the information module, public information, further reduce information asymmetry, safeguard investors' interests.

Due to the lack of funds, equipment, talents and other supporting facilities in the early stage of the establishment, the company is faced with a high market risk, which leads to the initial financing difficulties of enterprises. At this time, the government can support some scientific and creative enterprises through the park platform development fund. When the development of enterprises is on the right track, the development fund of industrial park platform and Banks will participate in the development of enterprises through the linkage mechanism of investment and loan, so as to obtain higher returns and make up for the loss of early investment. In addition, the Industrial Park Platform Development Fund, in cooperation with the technology and financial services platform, on the one hand, to publish its own investment projects to the technology and financial services platform, to obtain the favor of other investors, improve the survival of the investment enterprise. On the other hand, the Industrial Park Platform Fund can obtain other investor's investment project information from the Science and Technology financial Service platform, select the quality project to carry on with the vote. The Technology financial Service platform under the mode of investment and loan linkage not only enables SMEs to obtain financial support from social investors, but also obtains industrial park support through the mechanism of investment and loan linkage.

## 5. Conclusion

At present, the research on the investment and loan linkage mode in the science and Technology financial service platform is less. On the basis of other research literatures, such as the technology financial Service platform, the investment and loan linkage mode, and through the research on the concept and category of the investment and loan linkage mode, combined with the enterprise life cycle theory, the paper puts forward the application framework of the investment and loan linkage mode in the technology financial service platform. The paper makes clear the operation flow of the investment and loan linkage mode in the science and Technology financial Service platform, so that the model can combine with the technology financial Service platform, and provide a new way and train of thought to solve the financing cost, narrow financing channel and how to enhance the sustainable development ability of science and technology financial service platform. Of course, the current research is not enough, how to use the investment and loan linkage model to develop technology and financial services platform in some areas need further in-depth study. such as the use of investment and loan linkage mode of science and technology financial Services Platform management model of the form and characteristics, as well as the use of investment and loan linkage mode of scientific and technological financial services platform for rapid and healthy development of the necessary policies, regulations and laws and other institutional norms.

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