

## The Analysis of Government's Role in the Development of Scientific and Technological Finance: Illustrated by the Case of Liaoning Province

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### Abstract

The development of sci-tech finance is largely dependent on the participation and support of the government, for it effectively supplements the insufficient by the invisible hand which includes the externalities of science and technology innovation and financial market failure, etc. Thereby, the government plays a Leading role in the process of enterprise independent innovation. The government's effects are composed of policies support, investment guide, market system construction and perfect the related law. At this stage, the government should play an important role in innovating the way of fiscal expenditure on science and technology and perfecting implementation of the preferential tax policy.

**Key words:** Science and technology finance; Government effect; Externalities; Market failure

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The sci-tech finance is a series of systematic, innovative arrangements of financial instruments, financial system,

financial policy and financial services, which can encourage the development of science and technology, achievements transformation and development of High and new technology industry. It is a system formed by the government, enterprise, market, social intermediary agencies and other main body which Provide the financial resources to the activities of science and technology innovation and their actions and activities in the process of financing for the Science and technology innovation. It is an important part of the national science and technology innovation system and financial system. As regard to the development of the sci-tech finance, the participation and support of the government is very important. Through the function of the "visible hand", the government, as an important subject for the input of external environment, can effectively deal with some questions of the externalities of innovation, financial market failure, etc. So, the government plays a guiding role in the process of enterprise independent innovation.

### 1. THE NECESSITY OF GOVERNMENT SUPPORT IN THE DEVELOPMENT OF THE SCI-TECH FINANCE

The government should play a role of support in the sci-tech finance, the main reasons are as follows:

First of all, to some extent, the government can compensate for the externalities of independent innovation. The externalities of independent innovation are that the enterprise innovation activities can have an economic impact on the external economy. It is the "spillover effect" of the other enterprises on science and technology innovation, which will give the external enterprise the additional revenues of innovation. It is the main reason that some technology has the property of public goods in the independent innovation process. Once the enterprise's innovation activities achieve success, other firms will try

to get information about the enterprise innovation, and as far as possible application to the company's production and operation activities, which make the innovated enterprise bear the entire risk, but enjoy partly benefits. Obviously, the benefits spillover of autonomous innovation will reduce the enthusiasm of enterprises for independent innovation. Owing to the characteristics of innovation, it is necessary that the government gives support and encouragement to the enterprise. Through a variety of laws and regulations, the government can build a legal environment of fair competition for the enterprise, especially strengthen protection from the enterprise for independent innovation products and intellectual property rights. In addition, the government can also enhance the support for self-directed innovation by some measures such as a variety of fiscal policy, preferential tax policy, government procurement, which are aim to reduce the influence of return spillover as much as possible, and to improve the enthusiasm of enterprises for independent innovation.

The second, the government deals with the problem of the independent innovation of the financial market failure. Independent innovation of the financial market failure mainly embodied in the following aspects: First, from the perspective of the law of technological development, there are inevitable phases of Science and technology innovation, such as the Technology research and development which include basic research and applied research, the commercialization of technology, the industrialization of technology. The closer to technology industrialization phase, the lower the risk of investment. From the perspective of the balance of benefit and risk, the institutional investors more like invest in the stage of the industrialization of the technology, rather than in the stage of technology research and development generally. Especially when investing in basic technology research. In order to reduce the risk of research and development, the institutional investors hope to get the "free rider" after other enterprises or institutions had the technological breakthrough. Second, from the perspective of the life cycle of the enterprise, the enterprises in seed and early-stage, facing a higher technology risk, market risk, management risk, are difficult to obtain the support of the formal financial institutions. Often, they only rely on the means of financing such as angel investment, government funding, personal savings. Even the venture investment, they rarely invest in seed companies and their investments in early-stage companies also were restricted. Although having the very good development prospect in the future, the companies in a seed or early-stage may end up failing, for the reasons that they lack effective financial support and can't get enough development funds. The government's active intervention can alleviate the failure of financial markets.

Third, the government is the stakeholders of the enterprise independent innovation. If the government

is viewed as a social economy, it is also stakeholders in the process of enterprise independent innovation, because of which can also be to bring economic benefits to the government. First of all, enterprise independent innovation affects national taxes which are the primary sources of funds for the government finance. Taking it as an example, government tax enterprise which is equivalent to get a call option, as the enterprises losses, they was not taxed and the call option in the state of out-of-the-money; as the enterprise profit, the call option in the state of in-the-money, they will be taxed on the basis of the size of profit. Thanks to the enterprise technology innovation is an investment behavior of high risk, once the innovation is successful, the monetary benefits of enterprises will improve greatly and the government can also gain more taxes from enterprises. According to the principle of options, the more energetic the technology innovation of enterprise, the higher the option value is, the more taxation the government will get. Second, the technology innovation of enterprise can improve the quality of the overall economic growth and the social benefits of economic development. The enterprise technological innovation can upgrade economic structure and promote strategic readjustment, achieve energy conservation and emission reduction, promote the sustainable development of national economy.

Fourth, the government plays a leading role in the process of institutional innovation. Institution is a type of "public goods", as a kind of universal rules, it is intangible. Institution also is the reflection of notion of human being as well as the public choice under the vested interests pattern, which reflected in law system or rules and customs, etc. Institution has the character of public goods, which decide the government, as the main body of supplies, have pivotal role in the supply system arrangement. Because of having an unmatched coercive power and a high degree of authority, the government can promote the forced institutional change, which can reduce organization cost and implementation cost of Institution innovation, reduce the time delay of institutional change, make the implementation of the new system more smoothly. The contradiction between the strong demand and lack supply of fund in the independent innovation is the result from the financial market failure, considering the above factors, the government intervention is inevitable choice. The government provides the market, economic organization with innovative institutional arrangements, attracting private-dominated economy to provide monetary support for independent innovation, which is the optimum choice to solve the problem. The government which has the advantages of mandatory, organization, detachment, efficiency in the institutional innovation, plays a key role in building the investment and financing system of independent innovation of science and technology.

## **2. THE GOVERNMENT SHOULD PLAY THE ROLE IN THE FINANCIAL DEVELOPMENT OF SCIENCE AND TECHNOLOGY**

### **2.1 The Government's Policy Support**

Financial institutions and private investors are not willing to invest in innovative companies. The reason is that there is an asymmetry of returns and risk, which means the investment risk so high that the expected returns are not sufficient to compensate. The policy support of the government should start to implement from the two perspectives of expected return and reduce investment risk. The aim is that balancing income and risk of the investment institution through the redistribution of risk and income. The supporting policies of increasing the expected return for the investment institution include reducing the income tax rate of investment, tax deduction and tax refund policy; the supporting policies of reducing the risk of investment are investment loss compensation, financing guarantee, etc.

### **2.2 The Government's Investment Guide**

Through establish the guiding fund of investment, namely Mother funds for investment funds, the fund of government develops the role of amplification and guiding by means with stage equity and follow-up investment, which attract the private capital to invest in innovative enterprises. This approach not only expands the investment scale, but also guides more money to invest in the innovative enterprise of the seed and early-stage. In addition, taking advantage of its information advantage in industrial planning and economic management, the government can recommend good investment projects and the innovation enterprise to financial institutions and securities market, which can guide the financial capital invest in the industry of government support and the enterprises of a sound prospects for development.

### **2.3 The Construction of the Market System**

Financial support system of innovative companies needs match a perfect market environment, which include the multi-layer capital market system, the perfect market intermediary service organizations, the technology market, property right trading market providing related services for the enterprise technology innovation, etc. The government should actively cultivate the market main body, strengthen the construction of market infrastructure and management system, improve the government's control and service level of the market, and accelerate the pace of the relevant market construction.

### **2.4 .Perfecting the Relevant Laws**

The legal construction is an important aspect of governmental system construction, is also the premise

of promoting sustained and healthy development of relevant industries. The financing characteristic of innovative enterprises is different from traditional enterprises; corresponding financial service activities are also different. In view of the traditional enterprise law in many places are not suitable for innovative companies, the government should have the innovation courage to timely modify and perfect relevant law on the basis of practice. Making the laws and regulations are compatible with financing needs of innovative enterprise, with the financial support system of independent innovation.

## **3. THE GOVERNMENT SHOULD DISPLAY ITS GUIDANCE FUNCTION FULLY IN THE DEVELOPMENT OF THE SCI-TECH FINANCE IN LIAONING PROVINCE**

As the old industrial base in northeast, Liaoning province is in the critical period of accelerating the industrial transformation and upgrading, developing the sci-tech finance can provide a full range of financial support for the innovation of science and technology, which is of great significance to promote the Liaoning province's capacity of independent innovation and transformation of the economic growth pattern. During development of the sci-tech finance in Liaoning province, the government's moderate intervention is needed, and the best mode of the government appropriate intervention is policy guidance. Through relevant policy support and guidance, the government creates a good financial market environment which lay a sound foundation for bringing up and development of scientific and technological enterprise. At present, the government should play an important role in the way of financial investment on science and technology innovation and perfect implementation of the taxation preference policy.

### **3.1 Innovating the Way of Financial Investment in Science and Technology**

First of all, innovating the way of financial investment in science and technology. The way of direct government appropriation gratis will result into lowering risk consciousness, lacking of necessary constraints, which don't conducive to improving the use efficiency of financial funds. According to the different nature of the research and development projects, especially the degree of its surplus, we can determine the different ways of financial subsidy, establish risk-sharing mechanism, maximize the guide function of government funds. Such as the r&d project with strong public welfare, including the basic research and the generic technology research, financial allocation is seen as the feasible financing method; but about the research project with

certain commercial value, we can take the flexible policy of interest-free loans, low-interest loans, credit guarantee, Loan interest so deducted, subsidy, equity financing and so on to support, guide the financial capital, venture capital, social capital actively participate in the implementation of national, provincial, municipal science and technology plan, Increasing efficiency of fund utilization. Namely, realizing the transformation from “government direct investment primarily type” to “government-led investment primarily type” in the mode of science and technology input. Second, by the way of continue to expand the size of the government guiding fund, encourage qualified cities and counties to set up the government guide fund, set up the government guiding fund matching with technology innovation, science and technology enterprise credit risk compensation fund special funds, venture capital funds, etc., we can form the atmosphere of the policy financial support within the scope of the Liaoning province.

### 3.2 Improve and Implement Preferential Tax Policies

Tax breaks are an effective mean for the government to guide the enterprise behavior. It is necessary in order to enact tax breaks policies for science and technology enterprises, and actively guides to science and technology enterprises improve the financial mechanism. For example, according to the pre-tax profits and established time we should set different tax rates, improve tax threshold and accelerate depreciation rate of fixed assets for the enterprises, especially focus on aspects such as research & development, set the preferential tax policies, guide enterprises to develop new technologies and products actively. For Banks, tax is an important component of business cost, but the government is lacking of the preferential tax policies for Banks. The categories of bank taxes are mainly the business tax and enterprise income tax. The business tax has the obvious distortion effect for loans on both sides, with bank loans for science and technology enterprises cannot all deductible in pre-tax, it seriously reduces the financing efficiency of financial markets. If it can cut tax for part of the credit interest income of Commercial Banks supporting the science and technology enterprises development, and this part will be as Banks' profits or as special risk compensation,

under the effect of profit-driven, Commercial Banks will inevitably incline to science and technology enterprises. In addition, in terms of risk investment, Liaoning almost has no substantial preferential policies. The prominent problem is the tax of risk investment income. On the one hand, due to the knowledge and technology can't include input tax, it makes the value-added tax system for high-tech enterprises inequality in reality; on the other hand, investors who invest venture capital do not have any income tax breaks, and this will go against direct investment in high-tech field, objectively suppresses the effect of the risk investment activities. Liaoning should earnestly implement the tax preferential policies of national and provincial related to promote scientific and technological innovation in the financial support, play a role of tax policy guidance. I suggest referencing the experience of Shanghai, Tianjin and other places, enforce the support to venture investment tax, local government retained portion taxes paid by venture capital institutions and venture capital executives, and reward them by the financial according to a certain proportion. For the small and mid-sized enterprise credit guarantee agencies which carry out the business to the science and technology small and medium-sized enterprise, implement the policies priority such as exempting from business tax, withdrawing the reserve funds, compensation for losses from the tax deduction. For science and technology small loans company implement business tax free, income tax by half preferential policies, promoting the healthy sustainable development of micro-credit company of science and technology, guiding drive more social funds to support development of science and technology small and medium-sized enterprises.

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## REFERENCES

- Cui, B. (2013). The role of government in the financial development of science and technology: the theory experience of China. *Journal of the Party School of the Central Committee*, (2).
- Yang, Z. T., & Li, J. D. (2009). *Finance support system for independent innovation research*. Economy & Management Press.
- Zhao, C. W., Chen, C. F., & Tang, Y. K. (2009). *Sci-tech finance*. Science Press.