

The Effects of Government Subsidies and Tax Incentives on Technological Innovation: Based on the Enterprise Life Cycle Perspective

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Abstract: Government subsidies and tax relief are important means of national strategic regulation and control, which effectively promote the technological innovation and development of enterprises. With the effective implementation of the national innovation-driven development strategy in recent years, it is of great significance to fully stimulate the technological innovation activities of enterprises. To encourage technological innovation of enterprises, government departments have formulated a series of preferential policies and increased the support for enterprises, among which government subsidies and preferential tax policies have played an important role. Based on the perspective of the life cycle, this paper analyzes the impact of government subsidies and preferential tax policies on different stages of the enterprise life cycle based on theoretical analysis and practical investigation. This paper probes into the influence mechanism of government subsidies and tax incentives on promoting technological innovation of enterprises, and puts forward some suggestions to improve it, to provide ideas for the future development of enterprises.

Keywords: Government subsidies; Life cycle; Tax incentives; Technological innovation

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1. Introduction

With the introduction of relevant national policies to encourage technological innovation in recent years, government subsidy policies and tax incentives have played an important role. Government subsidies and tax incentives provide financial support for the technological innovation of enterprises. At the same time, enterprises accelerate the cultivation of technological innovation under the strong support of government subsidies and tax incentives. As a result, the quality and quantity of innovation input and output of enterprises continue to grow, and the growth rate also shows an increasing trend year by year. Innovation performance has been significantly improved. There is no denying that technological innovation is an important driving force for the country's economic development, and enterprises are the main body of technological innovation. Due to the

risk and uncertainty of technological innovation activities, the increase in R&D investment cannot guarantee a stable return. Therefore, government subsidies and tax relief policies can reduce the cost of production and operation activities of enterprises, and help enterprises to boldly try more technological innovation activities. It can be seen that government subsidies and tax incentives play an important role in the road of technological innovation of enterprises, and effectively promote the development of technological innovation of enterprises. Based on the enterprise life cycle theory, this paper discusses the differences in R&D and innovation needs of enterprises at different stages of development and points out that there should be obvious differences in government subsidies and tax incentives at different stages of the life cycle ^[1].

2. The positive effect of government subsidies and tax incentives on technological innovation and the development of enterprises

2.1. Provide financial support to ease the financial strain on enterprises

Government subsidies and tax incentives make the impact and loss of the marketing environment relatively small. Government subsidies provide innovative financial assistance to enterprises, prompting enterprises to invest more funds in the independent research and development process and stimulate the innovation potential of enterprises. Tax relief reduces the tax pressure on enterprises, which is essentially equivalent to increasing the funds of enterprises indirectly. All these provide financial support for the technological innovation of enterprises, alleviate the tight financial situation of enterprises at a certain level, strengthen the determination of technological research and development of enterprises, and mobilize the driving force of enterprise innovation. The high risk of enterprise innovation activities prevents enterprises from obtaining financing sources through normal channels to a certain extent. In this case, internal financing becomes the main source of funds for enterprises, and tax relief can alleviate the problem of financing constraints for enterprises ^[2].

2.2. Ease the constraints on the amount of capital and reduce the risk of enterprise innovation

Enterprise innovation generally has the characteristics of large investment and high risk, and the innovation and development of enterprises must have strong financial support. Government subsidies can not only help subsidized enterprises obtain direct financial support, but also encourage capital investment from other financial institutions with their influence, and provide external funds such as long-term borrowing and bond issuance for subsidized enterprises, thus easing the constraints on the amount of capital in the process of independent innovation of enterprises and reducing the risks of enterprise innovation. In addition, government subsidies and tax incentives disperse the risks borne by enterprises and reduce the cost of innovation input. In this way, enterprises can invest more funds in R&D, production, core personnel technology training, and other projects closely related to technological innovation, thus improving the innovation level of enterprises. The improvement of innovation investment will further enhance the profitability of enterprises and pay more taxes, and then the government will increase incentives, forming a virtuous circle ^[3].

2.3. Reduce the cost of enterprise innovation and improve the level of enterprise innovation

As the maker of industrial policy, the government can accurately grasp the development direction of the frontier of science and technology compared with enterprises. Tax incentives and government subsidies disperse the risks borne by enterprises, reduce the cost of innovation input, and enable enterprises to try more technological

innovation activities relatively boldly. By guiding the innovation behavior of enterprises, the government enables enterprises to invest funds in more reasonable R&D projects, which enables enterprises to make achievements in innovation and increase innovation output continuously. This can promote the innovation investment of enterprises, avoid risky technological innovation investment, improve the innovation level of enterprises, and increase the R&D income of enterprises ^[4].

2.4. Mobilize the enthusiasm of innovative talents and improve the innovation performance of enterprises

Enterprises are an important driving force for scientific and technological innovation, and innovative talents are the core resources for the technological research and development of enterprises. No matter how high-end equipment and advanced technology are, they cannot do without the R&D investment of core technical employees, otherwise it is difficult to have R&D output. In this case, government subsidies and preferential tax policies can enable enterprises to have more funds in disguise to improve the salary of core technical employees in subsequent business activities, and at the same time provide subsidies or rewards to technological innovation talents. In this way, enterprises' attraction to technological innovation talents is further enhanced, and the enthusiasm for innovative talents is fully mobilized. They are willing to spend more time and energy on R&D activities to promote enterprise innovation and significantly improve the innovation performance of enterprises. It can be said that government subsidies and preferential tax policies have played a key role ^[5].

3. Government subsidies, tax incentives, and enterprise technological innovation based on life cycle theory

According to the enterprise life cycle theory, any enterprise is an organization with four life stages: establishment period, growth period, maturity period, and decline period. In different stages of the life cycle, enterprises have different R&D and innovation needs, so there are obvious differences in the effect of subsidy policies in different stages of the life cycle. Therefore, based on the different development stages of enterprises, this paper integrates the perspective of the life cycle into the conventional paradigm research that government subsidies and tax incentives can alleviate the capital pressure of enterprises and thus affect the innovation performance of enterprises. It is undeniable that technological innovation in enterprise R&D is a complex and systematic activity, including innovation decision-making, innovation resource input, and innovation output. Subsidy policies and tax relief run through the whole process of innovation activities. In terms of the whole life cycle, with the evolution of the enterprise life cycle, the effects of subsidy policies and tax relief have obvious differences in enterprise R&D and innovation activities ^[6].

At the early stage of the establishment of the enterprise, due to financing difficulties, large capital needs, and many innovation opportunities for the enterprise, the enterprise's goal at this time is to determine the appropriate R&D investment projects in time to lay a solid foundation for future development ^[7]. At this time, the implementation of the subsidy policy is conducive to broadening the financing channels of enterprises, reducing the information asymmetry in the process of enterprise financing, and easing the situation of capital shortage ^[8]. In the growth stage, the capital demand is greater, the external financing demand is enhanced, and the profit level of enterprises is unstable. At this time, enterprises should adopt more expansionary policies to expand the scale of operations. At this time, the issuance of subsidies and tax relief not only alleviates the capital shortage but also transmits good information, which can significantly increase the R&D input

and innovation output in this period. Accurately help enterprises to promote cooperative scientific research projects with stakeholders, to achieve the purpose of improving technological innovation of enterprises, and then continue to convert high profits into accumulation ^[9]. After the growth period of the enterprise lasts for some time, at this time, the capital is gradually abundant, the external financing demand is relatively low, and the profit level, scale, and venture capital ability of the enterprise have reached a stable state. At this time, the enterprise is in the mature stage, and the operation goal of the enterprise is to reduce venture capital. Therefore, the incentive effect of subsidies and tax relief on enterprises at this time is not as effective as that in the growth stage, the driving effect on independent innovation of enterprises is limited, and the R&D input and innovation output of enterprises in the mature stage cannot be significantly improved. Meanwhile, the willingness of enterprises to innovate and expand is also declining. When the enterprise enters the recession stage, the innovation power is insufficient, the operation is in a predicament, the profit level declines and the market share of high-tech products decreases ^[10]. At this time, the issuance of subsidies and tax relief becomes the supporting force for the enterprise to maintain the operation scale and maintain the status quo to the maximum extent ^[11].

4. Suggestions on the improvement of government subsidies and tax incentives from the perspective of the life cycle

4.1. Clarify the orientation of industrial policy, transmit policy dividends, and stimulate the innovation vitality of early-stage enterprises

Government subsidies and tax relief provide financial support for the technological innovation of enterprises, which is essentially equivalent to increasing the funds of enterprises. Since enterprises often face problems such as lack of relevant management experience, shortage of funds, and weak market competitiveness in the early stage of establishment, government subsidies and tax relief have strengthened the determination of enterprises in technological research and development, and alleviated the financial shortage of enterprises to a certain extent. The government should clarify the orientation of industrial policy for the capital subsidies and tax relief of enterprises in the early stage of establishment, effectively solve the barriers encountered by enterprises in the process of R&D and innovation, transmit policy dividends, help enterprises adapt to the market business environment as soon as possible, stimulate the innovation impetus of enterprises in the early stage of establishment, and maximize the release of innovation vitality of enterprises ^[12].

4.2. Strengthen subsidies, comprehensively weigh enterprises, and help growth-stage enterprises improve their R&D and innovation capabilities

By comprehensively weighing all aspects of enterprises, for enterprises in the growth stage, relevant government departments can strengthen subsidies through different models such as direct subsidies, incentives, further reducing tax rates, and so on. Government subsidies can not only provide financial support to enterprises but also drive capital investment from other financial institutions with their influence. Provide enterprises with external funds such as bonds and loans, effectively solve the problem of excessive innovation investment burden of enterprises, further reduce the innovation risk in the process of independent innovation of enterprises, efficient use of subsidy funds and reasonable allocation of resources, expand the capital investment in R&D innovation of enterprises, to promote enterprises to further enhance their competitiveness and improve the level of R&D innovation. This is to achieve long-term stable development of enterprises ^[13].

4.3. Provide technical guidance to accelerate the output of technological innovation and improve the output ratio of innovation achievements in mature enterprises

Government departments should focus on the management of mature enterprises, ensure the R&D and innovation achievements of enterprises, actively create a market business environment conducive to the transformation of scientific and technological achievements of enterprises and improve the transformation efficiency of innovation achievements for enterprises in the mature stage. The government should provide reasonable capital subsidies and tax relief to guide the innovation behavior of enterprises, so that enterprises can make achievements in innovation and invest funds in more reasonable research and development projects, and the innovation level will continue to rise. By providing technical guidance, the government can continuously improve the market-oriented technology trading service system, accelerate the technological innovation output of enterprises, enhance the core competitiveness of enterprises, and scientifically build diversified channels for the transformation of scientific and technological achievements ^[14].

4.4. Management should be carried out from multiple dimensions, and supervision of subsidy funds should be strengthened to avoid risky innovation investment in enterprises during the recession period

As the maker of industrial policy, the government can accurately grasp the development direction of the frontier of science and technology compared with enterprises. When enterprises enter the recession stage, the market share of high-tech products will decrease, the profit level will decline, the operation will fall into a dilemma, and the innovation motivation will be insufficient. At this time, the use of government subsidies should have a clear purpose, and the government departments should strengthen the supervision of subsidy funds. At the same time, comprehensive factors of all aspects of the enterprise should be fully considered to avoid risky innovation investment in the recession period. At this time, enterprises should properly consider some low-risk innovation investment projects and strive to maintain the existing innovation scale ^[15].

5. Conclusion

To sum up, government subsidies and tax incentives play a key role in the technological innovation process of enterprises. As an important tool of government macro-economic regulation, government subsidies and tax incentives play an important role in the process of enterprise technological innovation. Based on the enterprise life cycle theory, enterprises have different R&D and innovation needs at different stages of development, so there are obvious differences in government subsidies and preferential tax policies at different stages of the life cycle. In the early stage of the establishment of enterprises, it is necessary to clarify the industrial policy orientation, transmit policy dividends, stimulate the innovation power of enterprises, and maximize the innovation power of enterprises in the early stage of establishment. In the growth stage, subsidies and incentives should be increased to ease the financial constraints of enterprises, enhance the attractiveness of enterprises to innovative talents, and carry out comprehensive trade-offs to help enterprises improve the level of R&D and innovation. In the mature stage, the government should accelerate the output of technological innovation and improve the transformation efficiency of innovation achievements, so that enterprises can make achievements in innovation and constantly increase the output of innovation. In the recession period, the government should conduct multi-dimensional management, increase the supervision of subsidy funds, and avoid risky innovation of enterprises. The practice has proved that only continuous improvement and implementation of government

subsidies, tax incentives, and other relevant measures can further accelerate the technological innovation and development of enterprises and improve the performance of R&D and innovation.

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