

# Innovation incentive and enterprise innovation prospect

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**Abstract:** By referring to the relevant literature on tax incentives and innovation incentive policies, this paper follows the idea of "theoretical basis - effect difference - influencing factors" to sort out the theoretical logic of policy implementation, the effect on enterprise innovation and the internal and external influencing factors. The results show that: Existing studies start from the policy and use different perspectives to test the impact on enterprise innovation, and this impact will draw different conclusions with different factors such as region, time and perspective, but the overall positive incentive effect. In the future, we hope to find new and valuable research ideas and deeply explore the mechanism of policy influence.

**Keywords:** Incentive policy; Enterprise innovation; Policy effect; Influencing factor

## 1. Introduction

"Innovation is the strategic support for building a modern economic system", independent research and development innovation of enterprises has become an important driving force to participate in market competition, and innovation as an important factor for the country to participate in international competition, the benign interaction between the government and the market is particularly important. If a country wants to develop and an enterprise wants to make progress, it must rely on the power of innovation and the power of talents. Under the rapid development of a new round of scientific and technological revolution, the rapid rise of the new energy industry and the rapid development of artificial intelligence have made many industries experience a "big reshuffle". Moreover, we are currently experiencing the global economic recovery stage after the epidemic, and under the impact of the sluggish external market and the urgent internal transformation needs, the road of independent innovation and transformation is particularly important. In the process of innovation transformation, the growth of enterprises cannot be separated from the support of government policies. Topics such as whether government incentive policies have a positive impact on enterprises and how to promote the improvement of the quantity and quality of enterprise innovation have always been hot topics discussed by scholars.

In the specific practice of innovation-driven development, China regards enterprises as the main force of innovation, and constructs an incentive innovation system that combines production, university and research with enterprises as the main body. Specifically, it is mainly divided into two categories of incentive policies: tax incentives and government subsidies to continuously promote the R&D and innovation ability of enterprises. In the process of continuous improvement and enrichment of preferential tax policies, scholars start from the effectiveness of policy implementation to explore whether it has a positive impact on enterprises. Most studies show that tax relief and other preferential policies can effectively reduce the pressure on enterprises' R&D funds and stimulate their innovation vitality, thus promoting the improvement of the quantity and quality of enterprise innovation<sup>[1]</sup>. However, some scholars say that the government plays a weak role in the tax process and relies more on market-led innovation performance<sup>[2]</sup>. In more cases, enterprises often carry out "strategic" innovation in order to obtain government support<sup>[3]</sup>. In order to analyze the effectiveness of different preferential tax policies more specifically, some scholars gradually began to study different policies such as accelerated depreciation policy of fixed assets, additional deduction of research and development expenses, and income tax reduction and exemption of high-tech enterprises.

On the basis of the existing research, this paper tries to sort out and summarize the relevant literature according to the idea of "theoretical basis - effect difference - influencing factors", hoping to

find out new research innovation points.

## **2. The theoretical basis and path choice of policy influence on enterprise innovation**

### **2.1. Theoretical basis**

Technological innovation of enterprises has played a huge role in promoting the development direction of the industry and economic benefits, and further innovation is one of the important factors for the country to participate in international competition, so it is also regarded as the fundamental driving force for economic growth. Since the reform and opening up, although China emphasizes the mobilization of market vitality, "selective industrial policy" or "key industrial policy" is still the focus of policy implementation<sup>[4]</sup>. Among them, innovation incentive policy as an indirect guide to ensure the implementation of industrial policy. The most important thing is that it has a strong incentive effect on enterprises in the early stage, which not only helps enterprises to alleviate the financing pressure and risk in the process of R&D innovation, but also brings more information resources to enterprises. On the other hand, in the enterprise innovation output promoted by incentive policies, incentive measures for patent research and development, new technology and other aspects of enterprises can promote the transformation and upgrading of enterprises.

At the same time, the market plays a leading role in the implementation of innovation incentive policies. If enterprises want to get preferential treatment, they must rely on their own innovation output, and a good cycle is formed between the continuous output of quality results and policies. Furthermore, the continuous output of innovation results and a good cycle of government financial support increase the performance of enterprises, which in turn provides conditions for a dominant position in the market. Through the output of innovative scientific research activities to ensure certain policy support, so as to alleviate the financial pressure in research and development; The high-quality output of enterprises requires mature R&D equipment, new professionals and stable financial support; Therefore, the relationship between the two is mutually promoting.

### **2.2. Routing**

#### **2.2.1. Innovation incentive to improve the enterprise research and development enthusiasm**

From the perspective of economics, the incompleteness and asymmetry of information make the R&D activities of enterprises face the risk of market failure. The public goods formed by the innovation output of enterprises may cause the imitation of other enterprises in the market, thus reducing the market share of enterprises and reducing the innovation enthusiasm of enterprises. From the perspective of enterprises themselves, due to the effectiveness of imitation enterprises, it is difficult for imitated enterprises to safeguard their own rights and interests, so that imitation enterprises can obtain benefits with less cost. The innovation incentive policy reduces the investment pressure of enterprises in R&D activities by encouraging enterprises' independent innovation ability, drives the enthusiasm of the entire industry to conduct independent R&D, and forms a virtuous cycle of R&D - gain benefits - R&D; What's more, compared with the short-term benefits brought by strategic innovation, the benefits generated by high-quality output have a time continuity, bringing continuous increase in benefits for enterprises, and thus promoting enterprises' research and development motivation for high-quality output.

#### **2.2.2. Innovation incentives promote enterprise manpower upgrading**

Since the beginning of the 21st century, the number of people with higher education in China's labor force has increased rapidly, and along with the improvement of skill premium, the labor force with high skill level has converged in information, software, finance and other industries<sup>[5]</sup>, and these industries also have better development in innovation due to the absorption of a large number of high-tech talents. In terms of incentive policies, Liu Qiren et al.<sup>[6]</sup> analyzed the relationship between the accelerated depreciation policy of fixed assets and the upgrading of human capital, and concluded that the accelerated depreciation policy guided enterprises to optimize human capital by bringing additional innovation incentives; Dai Tianshi et al.<sup>[7]</sup> From the perspective of additional deduction of research and development costs also proves that the policy promotes the demand for technical talents in enterprises. Moreover, there is a close relationship between human capital and enterprise innovation, and innovation activities cannot be separated from the investment of research and development costs, but also from the contribution of technical personnel. A large number of existing literatures have fully

proved that human capital can promote the increase of innovation activities and innovation quality of enterprises<sup>[8-9]</sup>.

### 2.2.3. Innovation incentives reduce enterprise investment risks

Because the uncertainty of innovation activities magnifies the investment risk of enterprises, it becomes an important factor restricting the innovation investment of enterprises<sup>[10]</sup>. Due to the lag of information acquisition and the possible misdirection signals in the market, enterprises need to face changes in the market environment and policies, which may lead to the failure of R&D to achieve the expected results. Through direct financial support and indirect government information guidance, innovation incentive policies can share enterprise risks and reduce enterprise losses. On the other hand, the pressure of capital and manpower needed to be invested in the research and development process makes enterprises need the support of external forces; However, due to the asymmetry of information acquisition, investors lack interest in innovative projects<sup>[11]</sup>. At this time, the government sends certain signals to the market through incentive policies, reducing investors' risk perception of innovative projects and making it possible for enterprises to obtain more external financial support. Figure 1 summarizes the transmission path of innovation incentives affecting enterprises.

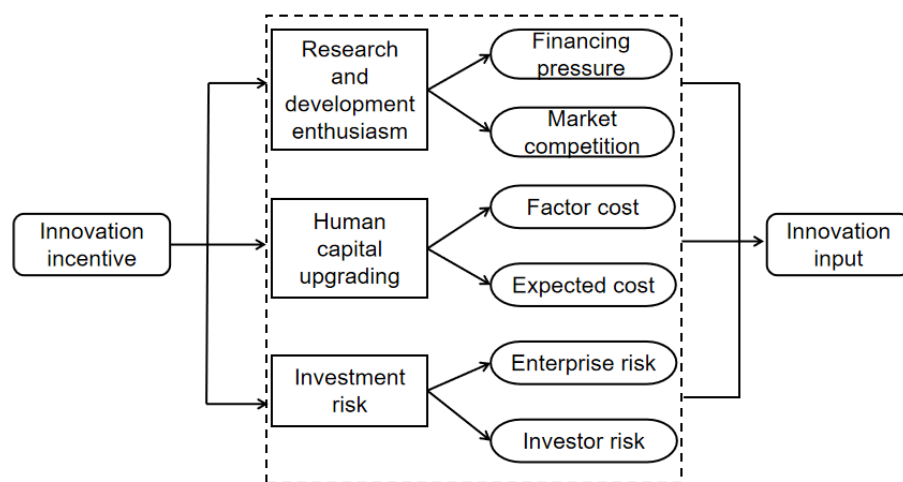


Figure 1. The transmission path of innovation incentives affecting enterprises

## 3. The influence of different innovation incentive policies on enterprise innovation is different

When many scholars empirically test the overall effect of innovation incentive, some scholars gradually subdivide innovation incentive policies to explore the incentive effectiveness of specific policies.

### 3.1. Accelerated depreciation policy for fixed assets

The accelerated depreciation policy depreciates the fixed assets purchased in the current period in accordance with a certain percentage, and reduces the taxable income tax in the form of deferred taxation, so as to alleviate the financing pressure of enterprises, accelerate the upgrading of fixed equipment, and promote the research and development of enterprises. In the assets of enterprises, fixed assets account for a relatively large proportion, so this policy has a very important impact on the tax burden of enterprises. Liu Qiren et al.<sup>[12]</sup> studied the effect of accelerated depreciation policy on enterprises' fixed asset investment behavior and found that this policy effectively promoted the replacement of enterprises' equipment, significantly reduced the probability of enterprises choosing to lease equipment, and its "interest-free loan effect" alleviated the pressure on enterprises' cashflow. Subsequently, in the study of 2020, by constructing a double-layer nested CES production function, the author explored the human capital structure and found that the accelerated depreciation policy could improve the employment proportion of technical talents in enterprises and promote the upgrading of the human capital structure of enterprises.

### **3.2. Additional deduction policy for R&D expenses**

As a representative of the inclusive policy, the R&D expense deduction policy has expanded the scope of preferential subjects after the negative list was put forward in 15 years, so that a wider range of enterprises can enjoy this policy, so it is also considered to be the most inclusive and fair of innovation incentive policies. At the same time, innovation performance can be improved by encouraging innovation, reducing operating costs and increasing financing<sup>[13-14]</sup>. Some scholars also explored the impact of the additional deduction policy on the total factor productivity of enterprises<sup>[15]</sup>, and concluded that the additional deduction policy helps enterprises increase R&D investment and promotes the improvement of total factor productivity by reducing the tax burden of enterprises.

### **3.3. Income tax relief for high-tech enterprises**

In order to encourage innovation and research and development in the high-tech industry, qualified enterprises are identified as high-tech enterprises, and enjoy a tax rate of 15% for income tax pre-payment declaration or transitional tax incentives from the approved year. This policy is different from the first two in that it is specific to specific industries and has a certain targeting. Sun et al.<sup>[16]</sup> conducted an empirical analysis of different incentive policies and found that as a preferential tax rate policy, the income tax reduction and exemption policy for high-tech enterprises can directly reduce the investment cost of R&D and innovation of enterprises, and actively guide enterprises to invest limited funds in the upgrading of physical and human capital while pursuing economic benefits. At the same time, it is found that there is a positive complementary effect between the tax exemption policy of high-tech enterprises and the additional deduction policy of R&D expenses. Chen Qiangyuan et al.<sup>[17]</sup> regard the income tax reduction policy as a representative policy of selective support incentives, which has higher requirements for the quality of technological innovation of enterprises and can more encourage enterprises to improve the level and quality of technological research and development.

## **4. Factors influencing the effect difference of innovation incentive policies**

Through the review of existing studies, it is found that there is no unified conclusion at this stage, and with the change of factor market environment and other factors, more differentiated research conclusions will appear. Next, this paper will try to review the internal and external factors of enterprises that may have an impact on the effectiveness of policies.

### **4.1. Internal factors**

#### **4.1.1. Enterprise scale**

Larger enterprises have greater advantages in financing, risk taking, software and hardware upgrading, etc. At the same time, due to their vast talent reserve, they are better able to understand new policies and capture new competition points. Therefore, enterprise scale becomes the decisive factor of R&D innovation<sup>[18]</sup>. Some scholars have also found that larger enterprises make easier use of social resources and have lower adjustment costs for equipment replacement. Although it is found from long-term research that small enterprises and large-scale enterprises have the same degree of response to policies, large-scale enterprises can make rapid response mechanism in the short term. On the contrary, some scholars have pointed out that the existing innovation incentive policies pay more attention to large and mainstream enterprises, and ignore enterprises with potential comparative advantages and scattered personalized innovation, resulting in the distortion of resource allocation of innovation resources<sup>[19]</sup>.

#### **4.1.2. Property right nature**

The nature of property rights, ownership structure, the market environment, resources and other conditions are also very different, so state-owned enterprises and private enterprises in innovation research and development and acceptance of policies there are certain differences. Most of the existing researches show that compared with state-owned enterprises, private enterprises invest more in innovative behavior. Yu Minggui et al.<sup>[20]</sup> used the information in the "Five-Year Plan" to test the effect of policies on R&D and innovation activities of enterprises, and the results showed that industrial policies significantly improved the innovation of encouraged enterprises, especially the technological innovation of private enterprises. The reason may be that, on the one hand, state-owned enterprises need to maintain their inherent challenges of social and economic stability, and need to assume social

responsibilities beyond economic benefits; On the other hand, due to the political connection between state-owned enterprises and the government, state-owned enterprises tend to make use of "relationship" to obtain benefits, which ultimately leads to weak innovation motivation<sup>[21]</sup>.

## **4.2. External factors**

### **4.2.1. Marketization degree**

According to new structural economics, the technological innovation of enterprises and the realization of industrial transformation and upgrading require the combination of "efficient market" and "promising government". The importance of "efficient market" is to guide enterprises to carry out production activities, obtain better profits and competitiveness, and provide material basis for the upgrading of existing industries. The degree of marketization in different regions is very different, which leads to different institutional environments in different regions. Empirical studies show that regions with a higher degree of marketization have better effects on innovation incentive policies. The reason is that in regions with low government intervention, there is sufficient market vitality, and enterprises rely on market impetus to obtain innovation resources and driving forces. Moreover, the advantages of high financing level and wide financing channels in this region also facilitate enterprises to obtain support from financial institutions, and the company has a good environment for innovation research and development and independent research and development. And then make better use of government incentive policies to achieve the icing on the cake effect.

### **4.2.2. Legal environment**

The role of "proactive government" is to provide certain incentives to innovative enterprises, and at the same time, to create a better atmosphere for enterprises by improving social infrastructure, laws, regulations and other rules and regulations to ensure the smooth progress of technological innovation and industrial upgrading. Studies have shown that a good legal environment is particularly important for enterprise innovation. The better the legal environment of the region where the enterprise is located, the more perfect the legal system, the higher the transparency of market information, and the more law-abiding enterprises can be. When involved in disputes, illegal enterprises are less likely to seek a "helping hand" to better protect their legitimate rights and interests<sup>[22]</sup>. Moreover, the improvement of the legal environment is accompanied by the enhancement of people's legal awareness. By increasing the rewards and punishments for enterprises, the risk cost of enterprises that steal other people's research results will be increased, so as to reduce the "spillover" of R&D activities, improve the enthusiasm of enterprises, have more energy to invest in independent innovation and R&D, and bring economic benefits through the improvement of their own innovation technology.

### **4.2.3. Industry type**

There are also differences in how different industries respond to the policy. Dai Tianshi et al.<sup>[7]</sup> conducted a group test based on whether it is manufacturing industry or not, and found that innovation incentive policies have a more obvious impact on manufacturing enterprises, and the demand for technical talents in manufacturing enterprises is twice that of non-manufacturing enterprises. Castellacci<sup>[23]</sup> found that the incentive effect of tax incentives for industries with low R&D intensity is more significant, because industries with low R&D intensity are under the pressure of market environment and investment, and the experience of the effectiveness of preferential policies is enhanced due to their low investment level in the early stage. At the same time, for the high-tech field, the incentive policy of R&D investment is more attractive.

## **5. Conclusion and prospect**

After sorting out the literature on innovation incentive and innovation in recent years according to the idea of "influence path- effect difference - effect factor", it is found that the existing research mainly discusses the influence of innovation incentive policy on enterprise innovation from different perspectives and the derived policy action path. The research stage can be roughly divided into three stages:

In the first stage, scholars focused on the effects of tax incentives and government subsidies. Most scholars use the data of A-share listed companies to test from the perspective of input, and the results prove that tax incentives and government subsidies have incentive effect on enterprises, and the long-term effect is more significant than the short-term effect. However, the samples, empirical

methods and perspectives selected by different scholars have not reached a unified conclusion on the evaluation of the two major policies.

The second stage: start to explore the relationship between policy and innovation output, and conduct preliminary research on specific incentive policies subdivided under the policy. This stage deepened the research on the impact of tax incentives and government subsidies on enterprises, but there is no unified standard for measuring enterprise innovation output, so there is no unified conclusion on whether it has incentive effect on enterprise innovation output. Scholars have long debated whether policies are mutually reinforcing or conflicting, but the concepts of "efficient markets" and "productive government" have been accepted facts.

The third stage: At this stage, scholars do not simply focus on the simple evaluation of a single policy, but make specific division, and introduce differentiated internal and external conditions for different industries and different policies to explore the impact on the policy effect. From the perspective of enterprise scale, assets and employees at the beginning, to the internal factors such as cost stickiness and investment risk, and external factors such as market environment, legal environment and political connection, the research results also have more differences. This, to some extent, broadens the research thinking and gives a clear trend for better policy evaluation.

From the perspective of existing research methods, there are three main categories: First, the use of macro data to study the impact of policies on the overall region and industry; The second is to analyze the theoretical text at the micro level by using questionnaires and manual sorting of company data. The third is the use of enterprise financial data, combined with economic principles to construct a model, the use of empirical testing method for testing. Generally speaking, the third method combines theory and data testing, which is the most respected method by scholars at present.

Of course, existing studies have explored the relationship between policy and enterprise innovation from different angles, and have made great contributions to testing the effectiveness of policies and further improving policy measures. But with the development of the digital economy and green innovation, there are many things that are worth further discussion and consideration:

First, the mechanism of incentive policy and enterprise innovation. The relationship between innovation incentive policy and enterprise innovation is complicated. The existing literature rarely discusses the content that affects incentive deeply, and the discussion of potential incentive is of great significance for the further development of enterprises and the improvement of policies. Secondly, the discussion on enterprise innovation mainly focuses on input and output, and innovation output is also the main observation to measure the effectiveness of policies. In the current measurement of innovation output, the mainstream influencing factor is the number of invention patents and licenses of enterprises, but this method is rather one-sided, and the behavior of "strategic innovation" of enterprises interferes with the accuracy of this measurement method. More objective approaches such as knowledge breadth, machine learning, and semantic research have gradually emerged. How to accurately measure the quality of innovation output is still a difficult problem at present. Finally, we should pay attention to the changing trends of domestic and foreign policies in real time, learn from innovative countries to explore the application of policy incentives, and conduct quantitative analysis by means of policy sorting and feature analysis, so as to draw more scientific and rigorous conclusions.

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