

# The Impact of Taxation on High-tech Enterprises in Environmental Protection

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**Abstract.** With the rapid development of technology worldwide, competition in innovation capabilities among various industries is becoming increasingly fierce. Taxation, as a bridge connecting corporate behavior and government attitudes, plays an important role in assisting the development of high-tech enterprises and promoting technological progress in the industry. Therefore, exploring the most suitable tax preferential policies is a particularly crucial measure. In existing research, we can conclude that preferential taxation can promote research and development investment, improve innovation capabilities, and promote technological progress in high-tech enterprises. This paper mainly studies the effect of tax incentives on high-tech enterprises in environmental protection. While reaching similar conclusions, it is believed that tax incentives in this industry can promote technological innovation while protecting the environment, which is different from the external effects of other industries. It also points out the possible problems in implementing tax incentives for the environmental protection of high-tech enterprises from both the enterprise and government levels and proposes corresponding solutions.

**Keywords:** Tax incentives; High-tech enterprises; Environmental protection; Technology innovation.

## 1. Introduction

### 1.1. Background

With the rapid development of technology, and innovation capabilities in various countries around the world, competition among high-tech enterprises is becoming increasingly severe. How to seize the opportunity for development and breakthrough limitations in the era of technology has become a problem that countries, industries, and enterprises must face. Taxation is one of the important expenses of high-tech enterprises and one of the important channels for determining the behavior of enterprises. Tax policies can greatly change the investment behavior, development direction, and output of high-tech enterprises. Tax reduction policy is an important way to regulate the relationship between the government and enterprises and assist high-tech enterprises in research and development. Studying the impact of tax incentives on high-tech enterprises can help us better understand the current situation of the high-tech industry, and thus formulate reasonable tax incentives to promote the sustainable development of high-tech enterprises. In the era of rapid development in the high-tech industry, the government should become the strongest support and arm for high-tech enterprises, helping them to gain an advantage in competition and contribute the greatest strength to the country's technology and innovation. Therefore, finding the most suitable tax preferential policies between enterprises and the government will drive the country's technological progress and innovation breakthroughs.

### 1.2. Related research

Luo used a regression model to explore the relationship between investment in scientific research and the development of enterprises and the tax incentives provided by the government. It is found that government tax incentives can promote high-tech enterprises' investment in scientific research, with income tax having the highest priority and greatest impact. Suggestions were given that the government should formulate policies that are conducive to technological innovation for enterprises, increase profits through technological innovation, and introduce more high-tech industries to promote the development of technology and the economy [1]. Zhan and Li established a multiple linear

regression model using descriptive statistics and regression methods for empirical research. Through theoretical analysis and data statistics on the influencing factors of the effective tax rate of high-tech enterprises in China, it was found that the higher the value-added tax burden, research and development investment, and the proportion of researchers, the lower the effective tax rate of the enterprise; While the improvement of profitability, earnings management level, and corporate assets can increase the effective tax rate [2]. Gong et al. established a game theory model for the interaction between high-tech enterprises and the government, analyzed the changing patterns of interactive behavior between the government and these enterprises, and proposed a win-win situation between the government and enterprises [3].

Ma and He used a dynamic panel model to study the impact of corporate income tax incentives on the innovation improvement of high-tech enterprises by summarizing and analyzing data reports. Research has found that government incentives for corporate income tax can significantly improve the innovation capabilities of high-tech enterprises, but cannot significantly improve the efficiency of patent applications. In addition, the preferential measures for corporate income tax have increased the innovation efforts of enterprises in the eastern region with certain competitiveness. The same research conclusion also applies to enterprises with different ownership properties [4]. Ding et al. conducted empirical research on the role of government tax policies in research and innovation for enterprises by summarizing survey data. Tax incentives can significantly stimulate enterprises to increase their investment and output in technological innovation, with income tax having a greater incentive effect than turnover tax to some extent [5]. Wang et al. studied the impact of value-added tax on enterprises' research and development, and the current status of value-added tax collection in the chip industry, focusing on the trade war between China and the United States, which has shown that the reduction of value-added tax can promote technological innovation, enterprise investment, and research and development investment. Especially in the chip industry. the reduction of value-added tax can significantly increase enterprise investment, and these conclusions provide a theoretical basis for reducing value-added tax rates [6].

Liu et al. used a double difference model and a variable intercept panel data model to explore the impact of tax reduction policies provided by the government for high-tech enterprises on their total factor productivity and its decomposition indicators. Research has found that tax reduction policies can significantly promote the total factor productivity and scientific and technological progress of high-tech enterprises, but at the same time reduce the technological efficiency of large high-tech enterprises to some extent [7]. Su and Fan used samples from some high-tech enterprises to study the relationship between the income tax incentives enjoyed by high-tech enterprises and their investment in scientific and technological innovation, found that income tax incentives can increase investment in scientific and technological research, proposed that state-owned enterprises can make reasonable use of income tax incentives to improve their innovation capabilities [8].

Bai et al. studied how different types of companies implement earnings management under expected tax reduction policies and concluded that during periods of high tax rates, companies tend to pay more attention to reducing earnings, leading to a decrease in revenue [9]. Liu and Fang used the theoretical framework as the background and conducted a natural experiment based on the 2017 value-added tax rate reform to study the impact of value-added tax rate reform on corporate tax burden and found out that this reform reduced the total tax burden of enterprises, but had little impact on corporate income tax [10].

### 1.3. Objective

This paper will study the impact of tax incentives on high-tech enterprises in the environmental protection industry. Chapter 2 starts from two aspects: technological innovation and enterprise costs, and studies the impact of implementing tax incentives on enterprise profits and innovation capabilities. Chapter 3 analyzes the possible problems in promoting tax incentives in the environmental protection industry from the perspectives of enterprises and the government and provides feasible suggestions to address these issues.

## **2. The Impact of Tax Incentives**

### **2.1. From the perspective of technological innovation**

In the context of implementing tax incentives for innovative enterprises, if enterprises conduct research on green technology innovation and enhance their green technology innovation capabilities, they will be affected to some extent by certain aspects.

#### **2.1.1 Promoting green scientific and technological innovation**

Ma and He used data analysis and dynamic panel models to study the impact of corporate income tax incentives on the innovation improvement of high-tech enterprises. Research has found that corporate income tax incentives significantly enhance the innovation capabilities of high-tech enterprises. With the implementation of tax preferential policies, enterprises' costs decrease and profits increase, making them more likely to choose to increase investment in green technology innovation. Enterprises have developed new and more environmentally friendly products with additional profits, making their emissions of pollutants lower than those under the original production mode, and ranking themselves among green and environmentally friendly enterprises. Only then can they truly effectively utilize the impact of tax incentives on corporate profits.

#### **2.1.2 Strengthening the role of public supervision**

The tax incentives for high-tech enterprises have shown an increase in the importance placed on technological innovation by both the state and society. This awareness has been implemented through tax incentives for enterprises, in order to enable them to truly develop new technologies and protect the environment. The innovation and environmental awareness of enterprises will increase, and gradually the environmental awareness of every citizen will also increase. When citizens examine a company, they will pay more attention to its innovative environmental protection practices and tend to choose companies that do better in environmental protection, which plays a natural and universal role in monitoring the company's green environmental protection. In order to cater to citizens' environmental preferences, enterprises will inevitably increase their innovation in environmental protection, which is more conducive to making progress in environmental protection and enhancing the driving force of green technology innovation for enterprises.

#### **2.1.3 Increase in revenue from green innovative technologies**

Ding et al. conducted empirical research on the incentive effect of tax policies on enterprise research and development innovation and concluded that tax incentives can significantly stimulate investment and output in enterprise research and development innovation. Due to the implementation of tax preferential policies for the environmental protection industry, enterprises that can take the lead in making technological innovation and research achievements in energy conservation and environmental protection will lead other enterprises in entering and owning the market. In this situation, enterprises in the industry will generate mutually motivating innovation effects, forming healthy competition, and promoting green environmental protection and technological innovation in the industry. To increase the revenue of green innovation for enterprises and the entire industry.

### **2.2. Utilizing the cost constraint effect to analyze the impact of tax incentives**

The cost constraint effect refers to the effect of how to allocate these limited costs in a situation where costs are limited, in order to maximize one's profits.

#### **2.2.1 Increase in capital used by enterprises for research and development**

Due to cost constraints, if enterprises can receive tax incentives, the costs they can use for research and development, production, manufacturing, and other processes will be reduced. Tax incentives can reduce the original budget for environmental protection costs. Because the cost of investing in production, sales, and other aspects during a fixed production cycle is almost unchanged, enterprises can rely on increasing research and development costs to promote production. Under these

circumstances, enterprises will increase their investment in the research and development of green innovative technologies in order to improve efficiency and income.

### **2.2.2 Increase in corporate profits**

In the case of limited costs, enterprises can take out less funds to pay taxes, which affects the original production mode and patterns of the enterprise by a positive economic promotion, thereby directly improving the performance of the enterprise's operation. Even if enterprises can adjust their production and operation to a certain extent, such as increasing employee salaries, the scale of these adjustments will not be too large to ensure the normal operation of the enterprise. So, the most direct impact of tax incentives is to increase the revenue and profits of enterprises.

## **3. Problems and Suggestion**

### **3.1. Enterprises may engage in fraudulent tax incentives**

Due to the complexity of regulatory procedures and the multifaceted nature of inspections, some enterprises have made little effort in the research and innovation of high-tech, and have not made significant improvements in environmental protection. However, they can use some improper means, such as forging financial statements, to deceive tax incentives in environmental protection. This approach has not played a role in environmental protection, is still a waste of government finances, and at the same time has corrupted the social atmosphere, serving as a reverse guide for other enterprises in the industry. This has great potential harm to enterprises, industries, society, and governments.

For enterprises, in order to reduce fraudulent tax incentives, the following measures can be taken: (1) Providing moral and legal education to environmental protection enterprises, enhancing their self-awareness, and enabling them to self-regulate and avoid any fluke mentality; (2) Promoting the method of mutual supervision within the industry, so that enterprises can constrain each other and form a healthy competitive relationship.

### **3.2. At the government level**

#### **3.2.1 Government regulation is complex**

There are a large number of enterprises that have made research achievements in environmental protection, with complex scientific research contributions and diverse perspectives. It is difficult for the government to truly verify whether high-tech enterprises have made scientific research contributions, especially in the field of environmental protection. The results of environmental protection itself do not have unified hard indicators, such as air pollutants, water pollution, etc. The definition of index changes is also difficult to distinguish, and it is almost impossible to quantitatively analyze how much a certain research result contributes to environmental protection. Therefore, when the government provides tax incentives for these high-tech enterprises that protect the environment, it is highly complex and full of uncertainty.

Even though there are many enterprises that the government needs to inspect and there is great complexity in implementing regulation, the following suggestions can be made to improve the efficiency and intensity of regulation: (1) Setting strict reporting times, such as reporting on environmental research and progress every other month and increasing the number of assessments, can effectively reduce the possibility of fraud and enable the government to constantly monitor the scientific research progress of enterprises, which is beneficial for increasing the government's understanding of enterprises and improving the certainty of government behavior; (2) Opening and clear assessment indicators allow enterprises to have a deep and detailed understanding of government assessments. Enterprises can conduct self-assessment first, which is also beneficial for improving their self-awareness; (3) Discuss costs based on results and subsidize the research and development costs of enterprises based on their reported research results in environmental protection. This can reduce the situation of enterprises scamming tax incentives when there are no research

results, and also motivate enterprises to make practical efforts in research and development, make practical innovations for environmental protection, and drive the progress of the entire industry; (4) Increasing incentives and punishments, incentivizing enterprises that truly engage in technological research and development innovation in environmental protection, and strictly punishing enterprises that engage in fraudulent tax incentives, will serve as a deterrent to the industry.

### 3.2.2 The government can adopt hierarchical policies to support high-tech enterprises

It is difficult for the government to achieve absolute fairness when providing post-tax incentives. That is because it is difficult for the government to use a clear numerical value to express the specific contribution of a scientific research achievement to the environment when granting tax incentives to innovative environmental protection achievements of enterprises. However, when allocating tax incentives, it is necessary to provide a clear numerical value for calculation. Given this immutable fact, the government can abandon its pursuit of fairness and instead adopt hierarchical support policies.

Tax incentives can be layered through the following methods: (1) First, provide equal support to new enterprises in the environmental protection innovation industry. In the early stages of the development of these high-tech enterprises, search for the most promising ones, and then provide stronger tax incentives and policy support to provide financial support for their technological innovation. This can put pressure on all enterprises in the industry and promote healthy competition (2) Measuring the difficulty of research and development in the high-tech industry while measuring costs and achievements, and examining factors such as geographical location and personnel structure, provide varying degrees of tax support for enterprises in different situations.

## 4. Conclusion

This paper combines existing research results and studies the impact of tax incentives on green high-tech enterprises from two different perspectives: technological innovation and enterprise costs. This paper concludes that regardless of the perspective, tax incentives can promote green technological innovation, and increase profits and technological innovation revenue for enterprises. However, there may be some difficulties in implementing it in real life. At the corporate level, some companies have a mentality of taking advantage of government tax incentives. At the government level, government regulation is complex, making it difficult to conduct comprehensive inspections without omissions, and it is also difficult to achieve fairness in providing tax incentives. Based on the above questions, my article provides several suggestions. For enterprises, legal education can be strengthened, legal awareness can be raised, and the self-supervision of enterprises can be strengthened, Or enable enterprises within the industry to supervise each other. For the government, it is possible to strictly increase the number of assessments, disclose assessment indicators, discuss costs through results, and increase incentives and punishments; And give up blindly pursuing absolute fairness and instead use hierarchical support policies.

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