

# VAT Retention and Tax Rebate and Enterprise Innovation

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**Abstract:** the enterprise is a country's innovation main body, manufacturing enterprise is innovation highland, enterprise independent innovation ability is the key to the implementation of innovation driven development strategy, VAT as the main body of the current tax system in China tax, the influence of the policy changes on the enterprise is huge, VAT tax rebate policy as an important part of a new round of tax reform, will increase the current cash flow, may encourage enterprises to make more innovation. This paper takes the release of the Ministry of Finance and the State Administration of Taxation 2018) No.70 of the Ministry of Taxation in 2018 as the research background to study the impact of the VAT rebate policy on enterprise innovation. Through the summary and comment of the previous literature and combining with the existing exploration results, this paper discusses the possible impact of the implementation of the tax rebate on the innovation of manufacturing enterprises. According to the different characteristics of enterprises, it also puts forward the heterogeneous hypothesis based on the financing constraints, the difference of geographical location and the difference of enterprise property rights. The following several hypotheses are proposed in this paper. H1: Manufacturing enterprises that enjoy the tax rebate policy are more willing to innovate. H2: Compared with the weak financing constraints, the enterprises with strong financing constraints are more willing to innovate after enjoying the tax rebate policy.

**Keywords:** VAT retained for tax rebate, Manufacturing industry, Innovation.

## 1. Introduction

### 1.1. Research background

Manufacturing industry is the engine of national economic development and the core driving force of China's economic growth. Since the reform and opening up, the rapid growth of the manufacturing industry has created a miracle of China's economic development and become a veritable pillar industry of the national economy. Since 2010, China has maintained the status of the world's largest manufacturing country for 12 consecutive years. According to the National Bureau of Statistics, the total added value of China's manufacturing industry in 2021 was 31.4 trillion yuan, accounting for one-third of the global total. In addition, in 2021, the added value of China's manufacturing industry accounted for 27.4% of GDP, an increase of 1.1 percentage points over the same period last year, and finally achieved positive growth after many years. The proportion of the value added of manufacturing industry in GDP refers to the contribution of manufacturing industry to the national development, and is an important indicator to measure the development of a country's manufacturing industry and its industrial level. At the same time, there are many deficiencies in China's manufacturing industry and subsequently exposed. Compared with developed countries, China's high-end manufacturing industry occupies a relatively low proportion in the industry, the innovation ability of manufacturing enterprises is weak, the industrial technology intensity is not high, high-performance chips, electronic manufacturing, industrial software and other products with core competitiveness are largely dependent on foreign imports. Cutting-edge manufacturing products are controlled by foreign enterprises, which seriously affects the long-term sustainable development of domestic manufacturing industry. Therefore,

the Party and the state attach great importance to the improvement of the innovation, research and development ability of manufacturing enterprises.

When the input tax of an enterprise in the current period is greater than the output tax, it means that the enterprise bears the excess value-added tax, which should theoretically handle the VAT rebate for the enterprise. However, due to the consideration of economic development and tax collection and administration level in China, China implements the VAT retention system. Under this system, the tax rebate that enterprises cannot obtain is equivalent to the occupation of funds, which is very unfavorable to the technology enterprises and manufacturing industry with large investment in the early stage of equipment. Therefore, in 2018, the state administration of taxation issued the 70 file, released in 2019, 39 and 84 announcement, clear the VAT increment for rebate policy, including 84 public clear the part of advanced manufacturing applicable for tax rebate policy, allow the application for manufacturing enterprises to refund the incremental for tax refund is not limited by the input of 60%. In 2022, the Ministry of Finance and the state administration of taxation issued the 14 announcement, the manufacturing VAT rebates from incremental expanded to the stock, one-time refund stock for tax rebates, and monthly full refund incremental tax credits, further strengthen manufacturing VAT tax cuts, effectively reduce the manufacturing capital turnover and financial cost pressure, encourage the development of industrial technology-intensive manufacturing enterprises.

### 1.2. Research meaning

Since the reform and opening up, China's economic and social development, but the past mainly rely on factors and efficiency of extensive growth model is not enough to support the current social and economic development, must achieve

innovation driven new span, can in the economic globalization and the fierce international competition to win the development opportunity, become a real power. At present, the innovation and development of China's manufacturing industry are facing great challenges. It is of great significance for the government to make good use of fiscal and tax policy tools to support the innovation and development of manufacturing industry. Can the VAT reduction policy effectively reduce the tax burden of manufacturing enterprises? Can the reduction of VAT tax burden significantly improve the innovation ability of manufacturing enterprises? These are all questions worth thinking about. Therefore, this paper studies the impact of the VAT rebate policy on the innovation ability of manufacturing enterprises, and puts forward some policy suggestions that can reduce the VAT tax burden of Chinese manufacturing enterprises and promote the innovation of manufacturing enterprises, which has practical significance for further improving the VAT system.

## 2. Theoretical Analysis

### 2.1. The basic hypothesis

The impact of VAT rebate policy on enterprise innovation mainly includes the following aspects:

First, increase corporate cash flow. Enterprise innovation needs the support of innovative talent team, advanced equipment and technology, and innovation capital, and the capital factor is the decisive factor directly affecting whether the innovation work can be carried out. Before the VAT tax rebate policy, our country for the enterprise tax credit treatment is, implement the tax credit carry forward the next deduction system, the government will not leave the tax refund directly to the enterprise, but to carry forward to the next phase continue to deduction, such treatment will inevitably produce a lot of capital occupancy cost, bring negative impact to the enterprise's cash flow, the enterprise cannot be more money for research and development, unable to promote enterprise innovation, improve their own competitiveness. And the implementation of the tax rebate for tax policy can reduce enterprise tax cost, reduce the cost pressure of the enterprise, to increase the enterprise operating cash flow, which makes the enterprise in order to improve market share, get more profits, more money will be used for enterprise research and development investment and technological innovation, so as to promote the innovation of the enterprise, improve their competitiveness.

Second, it sends out policy signals. The VAT rebate policy, as a preferential tax policy, Can be through the signalling theory, It conveys a positive signal to the society that eligible companies will enjoy the tax incentives, And once the signal is put on the market, This will make many investors more inclined to enjoy the tax incentives when investing, At this point, there will be a shift from the psychological effect caused by the original policy signal to the actual effect of the enterprises enjoying the policy getting a large amount of investment, This will reduce the occurrence of financial difficulties in the process of innovation, To help companies ease their financing difficulties, Expand the financing channels, We will increase investment in innovation. At the same time, the preferential tax policy also released a positive signal to the management, namely the enterprise innovation development strategy trend signal, the signal release can see as helping enterprises to carry out the innovation research and

development work increase investment, and support and promote enterprises invest more money and energy to carry out research and development work, and enhance enterprise core competitiveness and the ability of sustainable development.

Third, reduce the cost and risk of innovation activities. The company needs to pay a lot of costs in innovation activities, including the investment in the research and development, the purchase of technical equipment and services, and the training and introduction of research and development talents. The company's innovation activities have great uncertainty and risk. So the company needs to consider not only the current cost, but also the future potential cost and the risk cost to bear for the failure of innovation activities. Therefore, it is particularly necessary for the government to formulate corresponding tax preferential policies to promote enterprise innovation and reduce the risk of enterprise innovation and research and development. And VAT for tax refund policy is such preferential tax policies, the implementation of the VAT for tax refund policy, refund the enterprise final tax credit reduces the enterprise tax burden, and share the risk of the innovation activities, so in the expected to get certain risk compensation, enterprise risk of innovation activity will also enhanced, so as to promote enterprise innovation. Based on the above analysis, we propose the core research hypotheses of this paper as follows:

H1: Manufacturing enterprises that enjoy the VAT rebate policy have better performance in innovation.

### 2.2. Nature of property rights

From the perspective of the property rights of enterprises, there are significant differences in the innovation behaviors of state-owned enterprises and state-owned enterprises and non-state-owned enterprises, so the influence of property rights should be considered when studying innovation activities. On the one hand, due to the differences in the management system, the leadership of state-owned enterprises appointed generally decided by the superior leadership, and short term, leading to the leadership of state-owned enterprises tend to pay more attention to short-term earnings, tend to carry out short, flat, fast investment projects, for long return period, the risk of innovation investment activity interest, investment motivation. In order to survive in the fierce market competition, non-state-owned enterprises must rely on continuous innovation to maintain their competitiveness. On the other hand, compared with non-state-owned enterprises, state-owned enterprises bear more social responsibilities, with policy support from the government, state-owned banks and relatively low financing cost, while non-state-owned enterprises cannot enjoy preferential financing policies and the traditional financial service mode, facing the problems of financing difficulties and high financing cost. Existing research shows that non-state-owned enterprises often face higher financing constraints than state-owned enterprises. Therefore, when the implementation of the VAT rebate policy improves the financial pressure, it is more abundant for state-owned enterprises, which are available for research and innovation.

Further, if considering the innovation heterogeneity, exploratory innovation is to develop new products, focus on future benefits, return cycle longer, more risk, development innovation is to improve existing products, focus on short-term interests, return period, low risk, combined with the characteristics of state-owned enterprises and non-state-

owned enterprises, it is not hard to speculate that state-owned property properties more willing to improve products, rather than state-owned enterprises are more keen to explore innovation. This raises the hypothesis that:

H2: Compared with state-owned enterprises, non-state-owned enterprises that enjoy the VAT rebate policy are more willing to carry out innovative activities.

### 2.3. Financing constraints

The innovation research and development funds mainly come from two aspects: internal financing and external financing. Generally speaking, considering that external financing requires R & D information disclosure and other issues, internal financing has always been the first choice for enterprises to make R & D investment. Only when internal financing is insufficient, will they rely on external financing. The VAT rebate policy can alleviate the financing difficulty of enterprises from two aspects; on the one hand, the refunded tax rebate directly complements the internal R & D funds and alleviates the internal financing difficulties; on the other hand, according to the signal theory, the VAT rebate policy is a good investment signal for the financial market investors, helping to enhance the recognition of the enterprise and innovative projects, reduce the information asymmetry caused by less R & D information disclosure, and alleviate the external financing constraints. Enterprises need financial support to carry out innovation activities. In the early stage of research and development, enterprises need to invest a lot of funds to obtain the research and development foundation including equipment, personnel and materials. In the later stage of research and development, funds are also needed to transform and promote the results. It can be said that every link of research and development innovation is inseparable from the investment of capital. If the capital is interrupted, the R & D activities will face the risk of suspension; the termination of the enterprise will suffer huge losses. In the face of capital pressure, enterprises with strong financing constraints will have low willingness and intensity of innovation investment. Based on the above analysis, the VAT rebate policy will relieve the internal and external financing constraints of enterprises to some extent, and relieve the financial pressure of enterprises. Based on this, this paper proposes the hypothesis that:

H3: After enjoying the VAT rebate policy, the manufacturing enterprises with strong financing constraints will increase their innovation efforts.

## 3. Empirical Research

### 3.1. Data sources

This paper involves the financial data enterprise information from the Tai'an database CSMR and Wind database, selected from 2007 to 2021 a-share manufacturing listed company data as the sample data, build panel data, released in 2018 tax 70 file as policy background, according to the 2018 return VAT final refund industry directory selected 12, manufacturing, industry as A research object, conform to the policy requirements of manufacturing enterprises for the experimental group, does not conform to the control group, A total of 2430 manufacturing enterprises.

### 3.2. Model specification

In order to study the impact of VAT rebate policy on the innovation of manufacturing enterprises, this paper adopts the

two-way fixed dual difference model, and referring to the article of Liu Jinke (2020), the model is constructed as follows:

$$RD_{i,t} = \beta_0 + \beta_1 Treat_i * Policy_t + \beta_2 RD_{i,t-1} + \sum \alpha Controls_{i,t} + u_i + \varepsilon_{i,t}$$

$RD_{i,t}$  The explained variable is, where  $i$  represents the year,  $t$  is the year, and represents the willingness of manufacturing related enterprises  $i$  to innovate in period  $t$ , which is represented through R & D expenditure.  $Policy_t$  The virtual variable represents the VAT rebate policy, before 2018, =0, 2018 and later years, =1.  $Policy_t Treat_i$  Representative virtual variables of enterprises, manufacturing enterprises belonging to the 2018 policy =1, not belonging to the scope of the policy =0.  $Treat_i Controls_{i,t} u_i \varepsilon_{i,t}$  Is the control variable, is the fixed effect, is the regression residual term.

### 3.3. Variable selection

The existing enterprise innovation mainly includes the following three types: 1. Potential technological innovation resource indicators, including enterprise engineering and technical personnel and industrial added value; 2. Technological innovation activities, that is, research & experiment development (R & D) activity input; 3. the output capacity of technological innovation, including the number of patent applications. The second method is the common practice of scholars in recent years. This paper selects the enterprise R & D investment as the index to measure enterprise innovation, draws on the practice of Zhou Keqing (2012), and measures the investment of manufacturing enterprises in innovation activities by the natural logarithm of R & D investment.  $RD_{i,t}$

Control variables: refer to the studies of Liu Xing (2019) and Mao Jie (2020), The control variables selected in this paper mainly include (1) enterprise size (Size), Using the natural logarithm of the year-end assets, Larger enterprises will have advantages in production and operation activities compared with smaller enterprises; (2) Return on total assets (ROA), Generally, the proportion of net income on total assets and total assets, Is the internal basis of enterprise decision-making, It is a financial indicator of comprehensive performance; (3) Operating revenue growth rate (IRR), It is the ratio of the added value of the operating income to the previous year, Represents the revenue situation of the enterprise, It is also the most important financial indicator reflecting the progress of the enterprise's main business; (4) Asset-liability ratio (Lev), Total ending liabilities / total assets, The asset-liability ratio is a financial indicator that both investors and shareholders are very concerned about, For the investors, A high asset-liability ratio means that the investment will take most of the risk. The shareholders hope to borrow money to operate, with their own limited capital to obtain the leverage benefits of the debt operation. (5) The shareholding ratio of the top ten shareholders (Shrcs4) is the representative amount of equity concentration degree. Variables were defined as described in Table Table 1.

### 3.4. Analysis of the regression results

Table 2 shows the benchmark regression results of this paper, indicating the impact of the 2018 policy on the innovation ability of enterprises in the manufacturing industry complying with the relevant regulations. To enhance the robustness of the results, the regression results control for the

fixed effect, the first column is the result without the control variable, and the second column is the regression results with the control variable. The core explanatory variables of this paper are significant in the regression, the first column is 1% level, the second as the level of 5% significant, shows that manufacturing enterprises in the scope of the policy implementation increased the innovation investment, the result of the regression well illustrates the hypothesis H1: VAT tax rebate policy to promote the innovation of manufacturing enterprises.

**Table 1.** The regression analysis

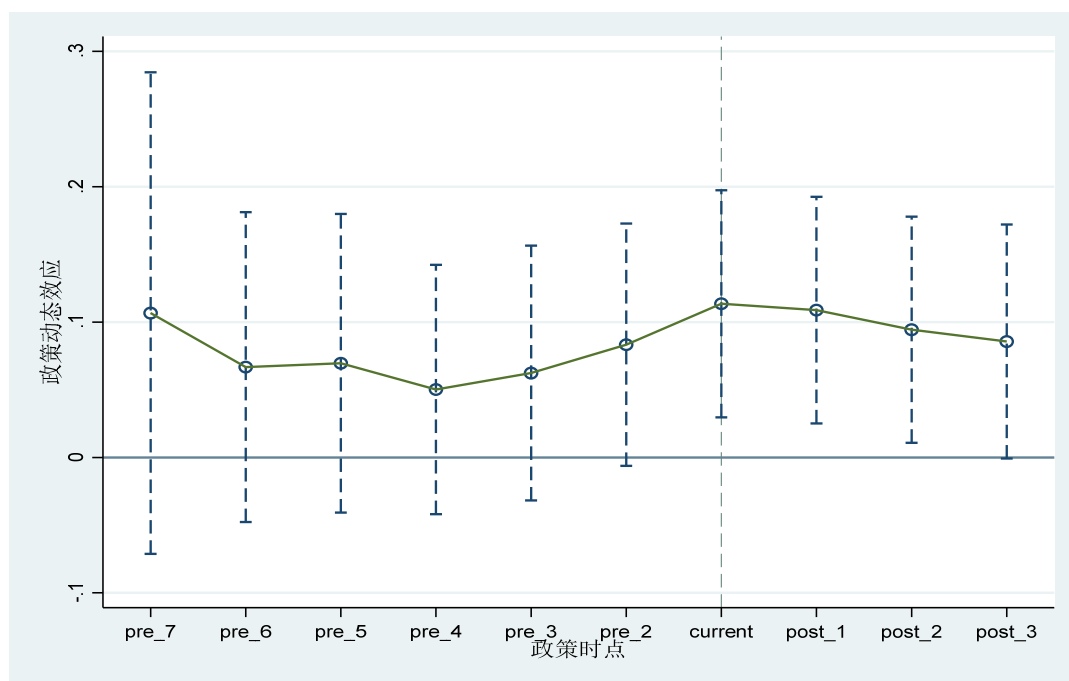
| VARIABLES           | (1)<br>RD            | (2)<br>RD            |
|---------------------|----------------------|----------------------|
| Treat × Policy      | 0.142***<br>(0.0258) | 0.0552**<br>(0.0235) |
| controlled variable | deny                 | yes                  |
| Constant            | 17.88***<br>(0.0101) | -0.114<br>(0.376)    |
| Firm FE             | yes                  | yes                  |
| Year FE             | yes                  | yes                  |
| Observations        | 18,983               | 18,983               |

Note: Standard deviation in parentheses, \* \* \* indicates coefficient significant at the 1% level, \* \* significant at the 5% level, \* significant at the 10% level.

### 3.5. Robustness test

#### 3.5.1. Parallel trend test

The premise of the dual difference model has the same



**Figure 1.** Parallel trend test

#### 3.5.2. Replacement by the explanatory variable

Replace the explained variable is a way of robustness test, this paper selects the benchmark model in the natural log RD with the ratio (RDSpendSumRatio) and the number of personnel proportion (RDPersonRatio), the two variables can to a certain extent reflect the willingness of manufacturing enterprises for innovation. The regression results of the model are as follows: (1) the regression results of the explained variable R & D investment in the operating income, including

trend. Before the implementation of the VAT rebate policy, the manufacturing enterprises applicable to the VAT rebate policy have the same decision-making trend as the control group. After the influence of the policy, the experimental team began to increase the r & d investment in the enterprises and were more willing to innovate. However, the development trend of the control group sample enterprises is not impacted by the policy, and the original trend should be maintained. In order to test this hypothesis and ensure the robustness of the regression results, the original model was modified to replace the core variables with the interaction terms between industry dummy variables and time dummy variables before and after the implementation of the VAT rebate policy.

Figure 1 shows the results after the parallel trend test, where the horizontal axis indicates the number of years before and after the policy implementation, and the vertical axis shows the changes in the innovation of the sample enterprises. With 2018 as the occurrence of the policy, 2017 (pre1) is used as the reference group control, and then successively pushed forward. As can be seen from the figure, before the policy occurs, the innovation of manufacturing enterprises is not significantly different. After the occurrence of the policy, the confidence interval is basically above 0, indicating that the VAT rebate has a significant positive effect on the innovation of manufacturing enterprises, which is most obvious in the first year after the implementation of the policy.

control variables and double fixed effects. The coefficient of the core explanatory variables was positive and significant at the level of 1%. (2) As the regression result of the proportion of the explained variable and the double fixed effect, the coefficient was positive and significant at the level of 10%. This shows that the result of the benchmark regression is steady and reliable, and the enterprises enjoying the policy are more willing to increase their innovation efforts.  $\beta_1 \beta_1$

**Table 2.** Rethe explanatory variables

| VARIABLE     | (1)                  | (2)                   |
|--------------|----------------------|-----------------------|
|              | RDSpendSumRati       | RDPersonRati          |
| S            |                      |                       |
| DID          | 0.437***<br>(0.123)  | 0.291*<br>(0.157)     |
| Size         | -0.809**<br>(0.358)  | 0.442**<br>(0.206)    |
| ROA          | -8.968***<br>(1.493) | -0.159<br>(0.992)     |
| IRR          | -1.292***<br>(0.231) | -0.297*<br>(0.165)    |
| Lev          | 2.086<br>(1.772)     | -4.591***<br>(0.663)  |
| Shrcr4       | 0.00403<br>(0.00671) | -0.00315<br>(0.00860) |
| Constant     | 22.07***<br>(7.264)  | 7.180<br>(4.491)      |
| Firm FE      | Y ES                 | Y ES                  |
| Year FE      | Y ES                 | Y ES                  |
| Observations | 17,756               | 13,330                |
| R-squared    | 0.585                | 0.897                 |

Note: Standard deviation in parentheses, \* \* \* indicates coefficient significant at the 1% level, \* \* significant at the 5% level, \* significant at the 10% level.

## 4. Conclusion and Policy Suggestions

### 4.1. Conclusion

China's manufacturing industry is moving towards high-quality development. The innovation of manufacturing enterprises is not only related to the future development of enterprises, but also related to the future development of the country. Therefore, it is of great significance to explore the impact of VAT rebate policy on the innovation of manufacturing enterprises. This article in the VAT for tax refund policy, enterprise innovation, VAT for tax rebate policy and enterprise innovation on the basis of literature and theoretical achievements, in 2007-2021 China a-share listed company consolidated data as A sample, build A double difference model to explore the influence of VAT for tax rebate policy effect on enterprise innovation, based on the selected sample empirical analysis file the following conclusions:

First, the implementation of the VAT rebate policy has an obvious positive incentive effect on the innovation of manufacturing enterprises.

Second, compared with enterprises with weak financing constraints, enterprises with strong financing constraints are more willing to innovate the VAT rebate policy; compared with state-owned enterprises, non-state-owned enterprises are more willing to innovate after enjoying the VAT rebate policy.

### 4.2. Policy Recommendations

We should further improve the VAT rebate mechanism to avoid tax fraud. It is the practice of many developed countries in the world to implement the final VAT rebate for enterprises, accelerate the implementation of the VAT rebate policy, better help manufacturing enterprises to carry out research and innovation, and catch up in the international high-end manufacturing field. Existing VAT tax rebate policy as 2019,2021,2022 continuous VAT deepening reform, the scope of policy from 18 advanced manufacturing, advanced service industry, the policy, the rebate amount also expanded from the

increment to the stock, and the rebate ratio, rebate limits also reduced, the scope of the VAT rebate policy benefit, but as a lot of diddle VAT tax refund cases. To this end, we should strengthen risk control and management, accurately divide early warning levels, verify the authenticity of business, achieve legally, compliant tax refund, and increase the punishment to form social co-governance power.

We will adhere to the principle of implementing classified tax rebates and voluntary tax rebates. First of all, we should strengthen the classification management of retained tax refund. In 2022 implement mass bottom tax rebates, the industry tax credit stock scale has been greatly reduced, considering the financial pressure and the national strategic development direction, on the design of the VAT tax rebate policy, suggest further fine molecular industry and design different rebate proportion, to leave tax credit burden heavier industry implement incremental full refund, to leave tax credit burden is not heavy child industry, can appropriately lower incremental tax rebate ratio. Secondly, for the long-term implementation of the delisting policy, we should adhere to the principle of voluntary tax rebate, relax the application cycle of retained tax refund, encourage qualified enterprises to consider whether to apply for tax rebate based on their own business conditions, and do not set the tax rebate as the target task of the tax system.

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