The Impact of Assets Accelerated Depreciation on Enterprise Investment Based on Statistical Analysis

Chaofan Wang¹

¹Business School, Shandong University, Weihai, Shandong, 264200, China
*Corresponding author’s e-mail: 201800620328@mail.sdu.edu.cn

Abstract. With the continuous upgrade of consumption structure, the supply and demand contradictions continue to deepen, and the Ministry of Finance issued by the Ministry of Finance in October 2014 stipulates that the six major industries can adopt accelerated depreciation of newly purchased fixed assets. The purpose of item initiative is to further promote the reform of the supply side. Based on the newly purchased fixed assets in 2010-2017, this paper discovered the research of difference-in-difference model analysis by using statistical methods. The policy significantly reduced the tax burden of the pilot industry, significantly improved the fixed asset investment in the pilot industry, further Promote the structural reform of the supply side of the company, and promoting the company's improvement efficiency. This paper helps to deepen the exploration of the impact of relevant depreciation policies, which provides a reference for China's better supply side structural reform, and promoting the development of enterprises, which is helpful to the development of deep application research of mathematical economics

1. Introduction

Since the reform and opening up, my country's economic development has achieved the world-famous achievements, the fast economic development, and the economic growth rate has made the world. But behind the rapid development of the economy, our country has unreasonable supply structure, and a series of problems with non-market efficiency. Especially for the manufacturing industry, problems such as severe capacity, slow technology update and low production efficiency are endless. Therefore, the national implementation of structural reform, optimizing production structure, and improves production efficiency, etc. Tax and fee expenses have an important impact on enterprise investment as an important expense, my country's way to facilitate tax policies, and promote enterprise investment.

In order to increase the company's update investment in equipment, improve the ability of enterprises and technological innovation, and then promote the fairness of internal and foreign capital, promote the upgrading and technical transformation of enterprise industry, and expand the total demand to maintain economic growth, September 2014 Finance The Department and the State Taxation Bureau jointly issued the "Notice on Perfecting the Fixed Asset Accelerated Depreciation Company Income Tax Policy" clearly stipulated in six industries such as electronic equipment industry, computer communications, etc. Equipment such as fixed assets can take accelerated depreciation methods. Simply, if fixed assets have been purchased after January 1, 2014, you can take the depreciation period of the equipment, or change depreciation methods to accelerate depreciation. Research on accelerated depreciation and related impacts first originated in 20 actual mid-aira (Second World War), the impact of various enterprises in various enterprises, the problem of investment is very willing, and the innovation ability is behind. In the face of this phenomenon, the US "Civil Code" policy has been
adopted to adopt a fixed asset to adopt an accelerated depreciation, which has a large positive effect on this phenomenon.

Regarding the impact of tax policy on corporate investment, the academic community did not have a unified conclusion, such as the literature [1] expounded the impact on accelerated depreciation in the capital user model, which indicates that acceleration depreciation can reduce investment. The related cost of people, thereby promoting corporate investment. They also believe that corporate fixed asset investment decisions depend on three factors: the return on investment, capital cost and investment income tax treatment. This model provides a theoretical basis for tax policies that affect corporate investment. In addition, based on tax backgrounds in developed countries [2], literature [3], the tax policy can significantly affect the conclusions of corporate investment, and released newly purchased fixed assets in the relevant six major industries in 2014. After the acceleration depreciation, the literature [4] and other deep explores the impact of the fixed assets adopt accelerated depreciation to enterprise investment, and the conclusions have been forwarded. However, there is also a different conclusion, for example, (literature [5], China's VAT transformation reform has promoted corporate investment; the US data discovered, only for C-Enterprise C, not for S The stock of dividends of the enterprise has not affected enterprise investment). In addition, accelerated depreciation policies do not affect the total amount of enterprise tax, which only affects the investment income of fixed assets through different time distributions that affect the depreciation of fixed assets, and directly change the total tax and fee. Literature [6] In the 2004 billing reform policy and its related research, the policy has also expounded that the policy has no significant promotion.

Therefore, according to the above demonstrations, the impact of tax policies on corporate investment is still worth researching and discussed. Also, an accelerated depreciation policy is more impact on enterprise investment. And in-depth, accelerated depreciation policies do not affect the total amount of enterprise tax, which affects the investment income of fixed assets by affecting different time distribution of fixed assets depreciation costs, and does not directly change the total tax and fee. Therefore, we have reason to believe that accelerated depreciation policies may be limited to corporate investment. Therefore, we examine the impact of this tax policy for enterprise investment (affected industries assigning 0) by constructing a dual differential model. According to the data of our country's share of listed companies, the results of empirical test show that companies affected by policy have significantly improved the amplitude of fixed asset investment by companies that have affected their affected policies. The above conclusion remains robust after the control group sample is tested.

In view, our thesis results show that accelerated depreciation policies affect the investment behaviour of enterprises. The conclusions of this article have the following contributions:

1. The conclusions of this paper complement the related literature on accelerated depreciation policies and corporate investment. This article studies the impact of accelerated depreciation policies on enterprise investment. Existing empirical papers are multi-research as the theme, explore the influence of US accelerated depreciation policies on related enterprises. In our research, we use China's enterprises to study the impact of accelerated depreciation policies for enterprise investment. Providing theoretical basis for research on relevant directions. 2) Further enriching the research method, in the current research on accelerated depreciation and related financial theories, but use dual differential models (DID) to study accelerated depreciation articles, this article passes The introduction of the dual differential model is discussed. Before and after policy implementation, the impact of fixed assets accelerated depreciation policy on enterprise investment is deeply explored by the independence of this policy discount. (3) This article is a series of issues that my country solves the supply structure and the unreasonable industrial structure, low market efficiency, and weak innovation ability.

2. Theoretical analysis and research hypothesis

With the development of social economy, our country's manufacturing related human costs, material costs, and tax-cost costs have risen. In the case of related income, the continuous increase in comprehensive costs will significantly reduce the relevant profits of relevant enterprises. The decline in profits enables companies to contain the willingness of relevant investment, all of which have slowed
down in the technical level update under the relevant manufacturing efficiency. The launch of accelerated depreciation policies is to solve this series of problems, how is the acceleration depreciation affect companies related investment? This article explores this influent path.

In the early investment theory related documents, corporate investment is mainly influenced by investment opportunities, corporate financing environment, social environmental factors, corporate financial funds, return rates of corporate investment.

On the one hand, from the corporate tax burden, in the case of incurred tax rate, the annual limit average method is used to make the company's weight, the natural loss method (i.e. the production method and working hours), the rapid depreciation law is the most difference. This is because the annual average method makes depreciable average, effectively, and the profit is too concentrated in a certain year, and the higher tax rate is applied; and the profits of other years are suddenly reduced. Therefore, the tax amount and the tax burden are relatively small, which is relatively light. On the contrary, accelerated depreciation law puts the profit in the last few years, will inevitably lead to a high tax rate in a few years. However, in the case of proportional tax rate, it is more advantageous to use acceleration depreciation law. Because accelerated depreciation law allows fixed asset costs to get compensation within the time limit, less profits in the enterprise, less profit; have a small amount of taxation, many profits, and more taxation, thereby playing the role of latency taxation.

On the other hand, under the same value of the product of the same value, after the depreciation of the relevant linear method, after depreciation of the relevant linear method, the expiration of the accelerated depreciation method is larger than the straight line. Depreciation present value and the tax revenue is relatively large, and a simple example of a simple example is 100, the use period is 10 years, the discount rate is 8%, the income tax rate of the company is 25%, net residual value For 0, the calculation of the tax revenue is 16.8 and 18.3, respectively, respectively, respectively, respectively, respectively, from 16.8 and 18.3, which can see the tax returns of the accelerated depreciation to the ground tax revenue from the straight line method. According to the related theory of literature [1], the higher the depreciation of the depreciation of fixed asset investments, the higher the return on investment in fixed assets, the higher the return on investment, and when the return on investment is increased, the willingness of the company will increase.

In addition, this policy is targeted policies. The implementation of policies is mainly for six related industries such as high-end manufacturing. This particular pointing to the company's financing environment has obvious policy advantage, this policy has been developed to a certain extent Passing a focus on developing a positive signal of the six major industries. Affected by a good policy, the external financing environment of the enterprise has improved significantly, and the major financing institutions increase the willingness of financing the six major industries, and according to the other conditions in the premise of other conditions in the literature [7], accelerate the depreciation new government implementation The lease financing scale of the handling assets of the handling group will increase significantly compared to the control group enterprises, the willingness and beneficial increase of such companies under the influence of double factors. When the company has achieved relevant financing, the corporate fund gap is reduced, reducing the company's dependence on short-term liabilities, so that the financial position of the enterprise will be significantly improved, thereby created funding for corporate investment, further promoting the investment of enterprises

3. Research design

3.1. Empirical model and variable definition
According to the relevant policy content of document 75, 2014, this accelerated depreciation of relevant policies is specifically targeted in computer, communication, software services and high-end instrument manufacturing, and buying on January 1, 2014. In the fixed assets, this policy has a specific referring to the industry, and this paper will be deemed to "treatment group" in this paper, and other non-policy pilot industries are "control group". And due to the proposal of the policy is 2014, the 2014 is considered an
incident, which is about 2014 and its follow-up year to assign a value of 1 (the year of the policy), which is 0 (not affected by the policy). years). According to this article, the following model is set:

\[
\text{Invest} = \alpha_0 + \alpha_1 \text{Treat} + \alpha_2 \text{Year} + \alpha_3 \text{Year} \times \text{Treat} + \alpha_4 \text{Size} + \alpha_5 \text{Revenue} + \alpha_6 \text{Funback} + \alpha_7 \text{Degree} + \alpha_8 \text{Position}(1)
\]

Regarding the model, we use the investment of enterprise fixed assets as the interpretable variable. On the left side of the model is the logarithm of the company’s investment amount of fixed assets, the right side of the model represents a virtual variable, indicating whether the industry is subject to this policy. Influence, if the company is a bioplastic industry, special equipment manufacturing, transport equipment manufacturing, computer communications and other electronic equipment industry, instrumentation manufacturing, software information service industry, this six industry values are set to 1, not for the six The large industry's enterprises take the value of 0. Year of Year, because the policy was issued in 2014, so we assigned a value of 2014 and follow-up (2014 - 2017), the previous year (2011 - 2013) is 0.

\(\text{Treat} \times \text{Year}\) is also our concern. This is the interaction between the two variables. The previous regression coefficient of this variable indicates that accelerated depreciation policies have the degree of influence of enterprise investment. If this coefficient is positive, it affects the effect Significant, if the result is negatively indicated that the result is not significant.

We also borrowed existing research, introduced a set of control variables on the right side of the model, including the size of the company, indicated by the total number of enterprises. The income of the enterprise Revenue, this variable is used to control potential investment opportunities to invest in corporate investment, business executives, positions and degree, and age. We take the logarithm of the company.

3.2. Samples and data sources
Since the financial and taxation (2014) No. 75 is promulgated in October 2014, it also stipulates the electronic equipment industry, the equipment industry, the transportation equipment manufacturing, computer communications, and software information services. Six industries such as the industry will take accelerated depreciation methods after January 1, 2014, so we selected the year (2011-2017) We selected the company's research topics in our country's A-share listed, and the samples were removed: (1) Samples of the financial industry (code J) (2) remove four areas of light industry, textile, machinery, and automobiles. Because the government has completed the No. 75 issued by 2014 in September 2014, the supplementary policy stipulates that the fixed assets purchased by light industry, textile, machinery and automobiles after January 1, 2015. Using accelerated depreciation methods, we choose to eliminate these four major industries to avoid interference with experimental results. (3) Remove the study variable lack sample. After the above elimination procedure, we have received 22,352 research data from 2,794 companies.

All sample company data comes from the CSMAR database.

3.3. Descriptive statistics
Before conducting regression analysis, this paper first made a simple statistical analysis we were tailoring all continuous variables and 99%. Describe all variables to obtain Table 1. As can be seen from Table 1, INVEST is an average of 19.92 after the investment of fixed assets, the standard deviation is 1.85, indicating that different companies may have different investment points due to different countries due to different development needs. From the minimum and maximum values. The average of Treat is 0.26, which means that the company affected by policy is 26%. Other control variables have no abnormalities.

| Variable | Number of samples | Average value | Standard deviation | Minimum | Maximum |
|----------|-------------------|---------------|--------------------|---------|---------|
| Invest   | 13,862            | 19.9220       | 1.8525             | 7.1969  | 27.3198 |
| Treat    | 13,862            | 0.2676        | 0.4427             | 0       | 1       |
| Year     | 13,862            | 0.6288        | 0.4831             | 0       | 1       |
3.4. Correlation analysis

Correlation analysis of all variables is shown in Table 2. It can be seen that the relevant INVEST fixed asset investment is negative with the correlation of Treat × Year. This is the opposite of the study assumptions in this paper, and further analyzes after adding control variables in the regression analysis. The correlation between SIZE is significant. Initially explain that the company's scale has a forward impact on enterprise fixed asset investment, the REVENUE and POSITION and the Invest correlation coefficient are also positive, and the higher the income situation in the enterprise, the company's fixed assets investment There are many, the higher the company's executive position, the more enterprises and fixed assets investment.

Table 2 Correlation analysis of variables

| Variables | Invest | Treat | Year | Treat×Year | Size | Revenue | Position |
|-----------|--------|-------|------|------------|------|---------|----------|
| Invest    | 1      |       |      |            |      |         |          |
| Treat     | -0.1785*** | 1     |      |            |      |         |          |
| Year      | 0.0579*** | 0.0180** | 1    |            |      |         |          |
| Treat×Year| -0.1039*** | 0.7544*** | 0.3503*** | 1    |      |         |          |
| Size      | 0.6699*** | -0.1915*** | 0.0563*** | -0.1623*** | 1    |         |          |
| Revenue   | 0.2428*** | -0.0014 | -0.0329*** | 0.3075*** | 1    |         |          |
| Position  | 0.0665*** | 0.0267*** | -0.0307*** | 0.0128 | 0.1168*** | 0.0288*** | 1       |

Note: ***, ** and * are indicated in 1%, 5%, and 10% respectively.

3.5. Regression analysis

The results of regression analysis are shown in Table 3 Treat × Year is significantly positive at 1% level on the regression result of Invest. This suggests that the implementation of accelerated depreciation policies has indeed significant impact on enterprise fixed asset investment. From the coefficient, Treat × Year is 0.0979, which means that the fixed asset acceleration depreciation policy of non-pilot enterprises has increased by 9.79%. At the same time, SIZE's regression coefficient is significant, indicating that the company's scale has a forward influence on enterprise fixed asset investment; the relevant coefficient of Revenue and Invest is also positive, the higher the income situation in the enterprise, the more enterprises fixed assets investment; In addition, the Position and Invest coefficients are also positive, the higher the company's executives, the more investment in the enterprise fixed assets.

In general, enterprises accelerated depreciation tax benefits can promote fixed asset investment behavior, which is consistent with most of the results of the previous people, and also verify the assumptions of this article.

Table 3 Regression analysis of variables

| VARIABLES | Invest |
|-----------|--------|
| Treat     | -0.97977 *** (-7.05) |
| Year      | 0.5289216 *** (13.38) |
| Treat×Year| 0.1780375 *** (3.79) |
| Size      | 0.8281729 *** (92.16) |
Revenue 1.73e-12***
  (10.11)
Position -0.0089069
  (-0.98)
Observations 13,862
R-squared 0.5994
Industry control
Year control

Note: ***, **, and * respectively indicate 1%, 5%, and 10% levels, the number of numbers in parentheses are corresponding to T values.

4. Conclusion and enlightenment

In this paper, the company has been used as a reference sample in 2011-2017, and the research method of dual differential model is used to test the impact of fixed asset investment in the company's fixed asset investment in 2014. According to the results of this paper, it was found that the 2014 fixed asset accelerated depreciation policy can significantly promote the investment of fixed assets in the six major industries of policy impact, which means that the investment structure and innovation capabilities of the relevant policies are concerned. Improved improvement. The relevant research in this paper complements the relevant literature on accelerated depreciation policies and corporate investment. And this paper studies the impact of accelerated depreciation policies to enterprise investment, and studies with China's enterprises, providing theoretical basis for research on relevant directions, making up for the lack of existing literature on fixed assets accelerated depreciation policies. In short, tax incentives for fixed assets accelerated depreciation of fixed assets have brought corresponding financing benefits to the company's related tax costs, mobilize the willingness and enthusiasm of enterprises to fixed asset investment, and increase investment in fixed assets, thus promoting The technology upgrade of the company has reached the effect of supply-side structural reform.

Finally, this article seems to have limited industry implementation, to continue to implement and expand the implementation and implementation scope, and further reduce the problem of corporate tax and fees, and promote enterprises to increase machine equipment investment by reducing corporate tax burden. In addition, promote the technology transformation and progress of enterprises, promote the transformation and development of the entire economy, and ultimately form a new China's new growth.

References

[1] Hall, R. E and D.W.Jorgenson, (1967), "Tax Policy and Investment Behavior", American An Economics Revive, .391-414
[2] Hassett, K.A, And R. G .Hubbard, (2002), "TAX Policy and Investment", Elsevier PRESS.247-259
[3] Zwick, E. Mahon, (2017) "Tax Policy and Heterogeneous Investment Behavior", American an economics revive, pp.217-48
[4] Liu Xing, Ye Kang Tao, Lu Zhengfei, "Accelerated Depreciation Policy and Enterprise Investment" - Based on "Quasi-Natural Experiment" (2018) NO18, 219-225
[5] Cao Yue, Chen Wenrui: "Policy Effects of Fixed Assets Accelerated: Evidence from Oil Taxes (2014) No. 75, 11-33
[6] Huang Zhi bin, Zheng Wei, Li Shao hua. Research on the regional differences of capital depreciation policies on investment - as an example of the basic industrial industry [J]. Audit and Economic Research, (2014), 58-66.
[7] Jiang Xiuwen, Chen Junfang "The Influence of Cash Flow on Enterprise Investment Decision" "Financial Forum" (2013) No.2-11