

## Research Article

# Accelerated Depreciation Tax Credit and Corporate Financialization Based on the PSM-DID Model

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In this paper, we use the data of China's manufacturing listed companies from 2009 to 2018, adopt the method of propensity score matching and double difference (PSM-DID) to solve the sample's selective bias, and select the accelerated depreciation policy of fixed assets issued by China in 2014 as a quasi-natural experiment to verify the robustness of the empirical results, which will affect the R&D investment of manufacturing enterprises and the structural tax reduction of China. This paper makes an empirical study on the effect of fixed asset investment to restrain the financialization of manufacturing enterprises. The results show that (1) accelerated depreciation policy of fixed assets significantly promotes the R&D investment and fixed asset investment of enterprises and reduces the level of enterprise financialization; (2) accelerated depreciation of fixed asset local tax policy, through guiding the R&D investment, fixed asset investment, and deferred income tax acquisition of enterprises. It guides the investment of enterprises to the real economic field, thus reducing the financial assets of enterprises. The investment has restrained the financial trend of real enterprises. The conclusion of this paper is of practical significance to support the formulation and implementation of the national structural tax reduction policy and to clarify the regulatory role and mechanism of the structural tax reduction policy.

## 1. Introduction

History and reality tell us that it is impossible to become a world power without a strong manufacturing industry. After 40 years of development, China's manufacturing technology level has reached the forefront of the world and became the only country with all kinds of manufacturing industry in the world [1]. With the "reindustrialization" and "manufacturing industry return" of developed countries in Europe and the United States, and the entry of low-cost strategy of Southeast Asian countries, China's manufacturing industry has been impacted in terms of technological progress and product export; China's manufacturing industry is facing two choices: increasing R&D investment or financial investment to avoid competition [2].

In 2015, Premier Li Keqiang put forward the concept of "building mass entrepreneurship and innovation" in the government work report. The made in China 2025 plan of the State Council points out that it will take ten years to become a manufacturing power. Innovation, R&D, transformation,

and upgrading are continuously improving to enhance the competitiveness of China's manufacturing industry [3]. Therefore, we should guide and support the manufacturing industry to carry out R&D and innovation with the joint efforts of various policies and control the crowding-out effect of manufacturing financial investment on operating funds [4].

As the main body of innovation activities, the research and development behavior and economic consequences of enterprises have always been a hot topic in financial research. As the root of enterprise innovation activities, R&D investment determines innovation achievements, company performance, and enterprise value to a certain extent. Since 2000, the government has encouraged the innovation investment of enterprises by implementing many fiscal and tax policies, which has promoted the innovation investment of enterprises to increase year by year [5]. But at present, there are still some problems to be solved, such as the low level and sustainability of R&D investment. In order to improve the level of R&D investment and enhance the sustainability of R&D investment, Premier Li Keqiang deployed and

improved the accelerated depreciation policy of fixed assets in the executive meeting of the State Council in September 2014 to promote the technological transformation of enterprises and support the innovation of enterprises. In the same year, the State Administration of Taxation issued CS (2014) No.75 document. Enterprises in six industries, including biological medicine, special equipment, railway, ship, aerospace and other transportation equipment, computer communication and electronic equipment, instruments and meters, information transmission, software, and information technology services, are allowed to shorten the depreciation life or adopt an accelerated depreciation method for accounting treatment on the fixed assets purchased after January 1, 2014. Although the total amount of depreciation of fixed assets remains the same in the service life to the enterprise, the policy can be used to accrue a large amount of depreciation in the current period of purchase of fixed assets and reduce the income tax payable in the current period, making full use of the time value of money brought by deferred tax payment, so as to reduce the cost of R&D activities [6].

In summary, the policy expects to accelerate corporate equipment renewal and technological R&D innovation, expand manufacturing investment, and promote investment of corporate funds in the real economy through deferred taxation preferential forms, thereby inhibiting corporate financialization and preventing the real economy take off from reality [7]. Since the introduction of the fixed asset accelerated depreciation policy, the research on the economic consequences of relevant literature has mostly focused on the accounting treatment of individual companies [8]. The overall effectiveness of the policy after its implementation has not been systematically tested. From the perspective of practice, there are different willingness and ability to engage in R&D activities among companies in different tax rates and different regions, and the policy effect is also quite different. Therefore, this paper will evaluate the implementation effect of this policy from the perspective of tax reduction effect and the guidance of enterprise capital investment formed by tax-accelerated depreciation deduction and carry out empirical demonstration on the theoretical mechanism of its impact on enterprise financing [9].

## 2. Theoretical Analysis and Research Hypothesis

In theory, accelerated depreciation policy for fixed assets guides enterprises to increase investment in R&D equipment and operational fixed assets. It can not only strengthen the company's own technological advantages and enhance the competitiveness of the company but also bring tax deduction effects for accelerated depreciation to the enterprise, so as to promote the return of funds to the physical manufacturing enterprise and promote enterprise R&D and innovation [10]. This reflects the role of fiscal and taxation policies in adjusting economic structure transformation, guiding the investment of physical enterprises' stock funds, and reducing the crowding-out effect of financial investments by physical enterprises, which is the best embodiment of inhibiting the disengagement of enterprises from reality, guides the capital

investment of manufacturing enterprises, and reduces the crowding-out effect of financial investment on manufacturing capital. It is the best embodiment of restraining the enterprises from getting rid of the real to the virtual [11].

However, due to the current high-yield demonstration effect of China's financial investment products, the expected growth rate of financial investment has exceeded the average growth rate of the real economy's income growth. Therefore, the adjustment effect of fiscal and tax policies may exist on R&D and innovation investment in physical enterprises. The impact may just be the icing on the cake [12].

Based on the existing literature, we can understand the impact of fixed asset accelerated depreciation policies on corporate R&D innovation and physical enterprise financialization from the following three aspects [13].

First, accelerated depreciation of fixed assets has reduced the actual cost of R&D and innovation investment to a certain extent. Structural tax reduction not only is an ex-post compensation mechanism but also has the characteristics of targeted delivery. It is more market-oriented than direct subsidies and can be more precise [14, 15]. Fixed asset depreciation tax credit, from the perspective of indirect supply of tax preference, can reduce the actual R&D cost through the time value of money, so it is widely used in developed countries [16]. The accelerated depreciation policy of fixed assets is to advance the income tax deduction, which can alleviate the impact of technology upgrading and industry competition, and avoid the tax deduction lag caused by the rapid elimination of the market. On the one hand, this early deduction forms the indirect capital supply for R&D investment; on the other hand, it forms a certain time value, thus reducing the cost of R&D investment [17].

Second, structural tax reduction policies such as accelerated depreciation of fixed assets have promoted enterprises' investment in R&D equipment, plant, and other aspects. Whether the structural tax reduction policy, especially the accelerated depreciation policy of fixed assets, has promoted the R&D investment of enterprises and whether there is a causal relationship between them have been the focus of controversy [18]. Tassej pointed out that the return brought by R&D investment has a strong recessive feature, and its spillover effect also affects the willingness of real enterprises to invest in R&D innovation, but the tax reduction policy can reduce the uncertainty of the return on R&D investment. R&D investment can reduce the concern of enterprises about investment loss and R&D cost, so as to promote the R&D innovation activities of enterprises [19]. Pottelsberghe et al. pointed out that structural tax incentives, especially depreciation policies for equipment and real estate, have a long-term effect on promoting R&D investment of enterprises. Subsequently, a large number of studies also support the structural tax incentives, especially the accelerated depreciation of fixed asset tax credit to promote the R&D investment of enterprises. Capelen et al. studied the depreciation tax reduction preferential policies of Norway in 2002 and found that the tax reduction promoted the R&D investment level of enterprises to a certain extent; Yang through the analysis of micro sample data found that manufacturing enterprises in Taiwan have higher R&D investment motivation and ratio; some

scholars have studied the reform of China's enterprise income tax and found that the R&D expense deduction and the accelerated depreciation policy of fixed assets indirectly promote the technological innovation of enterprises [20].

Third, the accelerated depreciation tax credit of fixed assets has increased the real assets of enterprises and reduced the income tax of enterprises from a long-term perspective, which makes the owners of enterprises willing to invest in fixed assets, thus reducing the allocation of financial assets, inhibiting the trend of enterprise financialization, and promoting the enterprises to get rid of the virtual investment. The financial tendency of monopoly large enterprises is obvious. Because continuous investment in the real economic leads to the increase of production capacity and the decrease of yield, it is more inclined to maintain monopoly and control scale and reduce the demand for real investment, and the surplus capital will flow into the financial field [8]. The excessive accumulation of capital and the increasingly fierce market competition make the investment opportunities in the real field less and less. The nature of profit-seeking and risk aversion of enterprises makes them tend to invest their own funds in financial products with a higher return [21]. Yao Weibao found that the competition caused by the prevalence of neoliberalism increased the output rate and labor productivity of commodities and made the profit contained in commodities fall. A large number of enterprises have invested in the financial industry in order to seek the growth of profit margin, and the financial market has become a gathering place for impatient speculators [22]. Wu Hong believes that financial investment by real enterprises is a short-term response to the decline of investment income in the field of real economy, and enterprises will eventually return to the real economy.

The profit-driven nature of capital makes enterprises pay more attention to the return of investment, but the phenomenon of tax avoidance also exists in China's private enterprises. Reduce the value-added tax and corporate income tax in the form of fixed asset investment, and obtain sustainable development plan and the ability to maintain the leading position in the R&D equipment and plant investment, reduce cash expenditure, and obtain stable cash flow [23]. It will form a virtuous circle of R&D investment, asset depreciation tax reduction, higher income tax shield, and recognition of tax relief and preferential authority, so as to further reduce taxes. Thus, while reducing the income tax expenditure, more assets and competitive advantages will be formed, and the technological content of enterprises will be upgraded to achieve higher tax preferential conditions and obtain more preferential policies [24]. Therefore, it can be inferred that Chinese enterprises have a stronger willingness to obtain the discount of depreciation and tax credit, increase the investment of R&D and innovation equipment and plant, reduce the taxable income, thus reducing the financial investment, and allocate more assets in the real economy [25].

Based on the three analysis above, the following three hypotheses are further summarized and put forward:

First of all, the original intention of the accelerated depreciation tax credit policy for fixed assets is to increase the R&D investment of enterprises and indirectly reduce the R&D

investment cost of enterprises, then enhance the confidence of enterprises in R&D investment, and provide indirect capital supply support for enterprises in R&D investment. In China, six industries with strong competitiveness in science and technology are selected as the pilot.

Therefore, this paper first needs to verify whether the accelerated depreciation tax credit policy of fixed assets promotes the level of R&D investment. Therefore, we propose hypothesis 1:

H1: accelerated depreciation tax deduction of fixed assets can promote the R&D innovation investment of enterprises [26].

The second is the accelerated depreciation tax credit policy for fixed assets, which is mainly due to the investment expenditure of R&D equipment and production and operation fixed assets. To form accelerated depreciation through fixed asset investment, accelerate depreciation and generate tax credit effect again, so as to form deferred income tax. The investment in fixed asset results in accelerated depreciation, which results in tax offsetting effect, thus forming deferred income tax. That is how policy affects the enterprises' investment. Therefore, we propose hypothesis 2:

H2: accelerated depreciation tax deduction of fixed assets can guide enterprises to invest in fixed assets and form deferred income tax.

As hypotheses 1 and 2 above, if the accelerated depreciation policy of fixed assets can effectively guide the enterprises' capital investment, the capital of enterprises will be more invested in R&D equipment and operational fixed assets. Furthermore, it can reduce the investment of enterprises in financial assets and restrain the trend of enterprises' financialization. Therefore, we propose hypothesis 3:

H3: accelerated depreciation policy for fixed assets can inhibit the trend of enterprise financialization.

In this paper, variable replacement and step-by-step regression are designed to investigate the impact of fixed asset depreciation policy on various investments and to clarify the mechanism of the impact of accelerated depreciation policy of fixed assets on corporate finance [27].

### 3. Research Design

*3.1. Sample Selection and Data Source.* As mentioned above, China has implemented accelerated depreciation tax credit policies for six major industries since January 1, 2014. The accelerated depreciation policy will be implemented in 2019. Therefore, we use the data of A-share listed manufacturing enterprises in a total of 10 years from 2009 to 2018, to build a panel database.

The number of enterprises in six industries, such as transportation equipment, computer communication and electronic equipment, instruments and meters, information transmission, software, and information technology services, is constantly changing. Therefore, based on the 2009 listed companies as the sample standard, the data comes from CSMAR sources, we finally obtain 308 listed companies in six industries and 1085 samples from A-share manufacturing companies.

Based on the policy of accelerated depreciation of fixed assets, the financial inhibition effect provides us a natural experiment for this study. In order to more effectively verify the impact of accelerated depreciation and tax credit policies for fixed assets on R&D investment and financialization of enterprises, we took 2014 as post, 308 enterprises in six industries as the experimental group, and other enterprises as the control group. The PSM method is used to match the samples, and the double-difference method (DID) which is commonly used to evaluate the policy effect is used to analyze, in order to verify the research hypothesis of this paper.

In order to ensure the reliability of the research conclusion, this paper deals with the samples according to the following steps:

- (1) Excluding financial companies and ST company samples
- (2) Eliminate the companies with missing data
- (3) Winsorize the continuous variables of all samples with 1% and 99% quantiles to eliminate the influence of outliers

Finally, 10,850 observations are obtained, and the financial data of the company are all from the CSMAR database of the GTA company.

### 3.2. Definition of Variables

**3.2.1. Explained Variable.** According to the research hypothesis in the second part of this paper, the explained variables are R&D innovation investment, enterprise fixed asset investment, and enterprise finance. In addition, in order to further verify the guiding role of tax preferences, the index of deferred income tax is added as the dependent variable.

① Explained variable 1: enterprise R&D investment (RD), calculated by the growth rate data of R&D investment amount

② Explained variable 2: fixed asset investment (face), calculated by the growth rate of fixed assets

③ Explained variable 3: financial level of enterprises (FIN), calculated by the growth rate of the proportion of financial assets in long-term assets

**3.2.2. Explanatory Variable.** This paper takes 2014 as the policy implementation node (post); take the six industry enterprises as the control group (treat), if the sample enterprises belong to the six industry, then treat is 1; otherwise, it is 0; in order to prevent multicollinearity, this paper uses  $\text{post} \times \text{treat}$  to generate the policy processing variable DID, which is the explanatory variable of the model, to test the impact of accelerated depreciation policy of fixed assets. This paper uses R&D investment, fixed asset investment, and enterprise financialization as dependent variables to verify the impact of accelerated depreciation policy on investment. Considering the other factors of R&D investment, fixed asset investment, and financial investment, we select certain control variables to make up for the influence of other factors on the policy effect.

In terms of the control variables, we choose the enterprise scale (size) and the listing period (age) as the control variables; further considering the cash requirements of investment choice, we choose the cash holding level (cash) and asset liability ratio (Lev) as control variables to determine whether enterprises with low debt and sufficient capital are more likely to have investment behavior; thirdly, considering whether the enterprise invests in R&D and fixed assets for production and operation, which may be affected by the profitability of the enterprise, the company's gross profit margin (GPM) and return on equity (ROE) are selected as the control variables; Fourth, whether technology-based companies pay more attention to R&D investment to maintain core competitiveness, so this paper chooses enterprises high-tech properties (Htech) as the control variable; finally, select the Tobin Q value (Tobin) as a control variable, when the Tobin Q value is large, the stock price of the enterprise is higher than the asset replacement cost, and the enterprise can obtain funds to purchase low-cost assets by issuing shares; otherwise, the investment behavior of the enterprise will be limited, so the Tobin Q value of the enterprise also affects the investment choice of the enterprise to a certain extent. Once the Tobin Q value is small, the enterprise may be more conservative or choose financial assets to allocate, leading to financial enterprises. The specific definitions of each variable are shown in Table 1.

**3.3. Sample Description.** The sample data described by the sum function of Stata software is shown in Table 2. The data used in this paper are 1085 A-share listed companies for 10 years, with 10,850 observations. There are great differences in R&D investment, financial asset investment, and fixed asset investment among the sample enterprises. The overall average value is optimistic. The R&D investment of enterprises is growing, and the trend of financialization is weak. In addition, it is worth noting that Chinese enterprises have a very low cash holding rate and total asset growth rate, but high asset-liability ratio, and the enterprises with the highest gross profit rate and return on equity come from medicine and liquor.

**3.4. Model Design.** According to the research hypothesis in the second part of this paper, the regression models of R&D investment growth rate, fixed asset investment growth rate, deferred income tax, corporate finance, and accelerated depreciation policy are constructed, respectively, (1)–(4) as follows:

$$RD_{it} = \alpha_0 + \alpha_1 DID + \alpha_2 Xlist_{it} + \epsilon_{it}. \quad (1)$$

Model (1) investigates the impact of accelerated depreciation of fixed assets on R&D investment:

$$FASS_{it} = \beta_0 + \beta_1 DID + \beta_2 Xlist_{it} + \epsilon_{it}. \quad (2)$$

Model (2) investigates the impact of accelerated depreciation tax credit policy on fixed asset investment:

$$DTax_{it} = \gamma_0 + \gamma_1 DID + \gamma_2 Xlist_{it} + \tau_{it}. \quad (3)$$



TABLE 1: Variable code and calculation formula.

Dependent variable	RD	Growth rate of R&D expenditure
	FASS	Growth rate of fixed assets of enterprises
	DTax	Growth rate of enterprise deferred income tax
	FIN	Growth rate of financial assets in total assets
Interpreted variable	DID	Post $\times$ treat
	Post	If the observed value is 1 in 2014 and later, otherwise 0
	Treat	Treat is 1 if the company's industry is within the scope of six industries; otherwise, it is 0
	Year	Year virtual variable
Control variable	Size	Company total assets dedimensionalization
	Lev	Company's total liabilities/total assets at the end of the year
	Htech	If technology enterprise Htech = 1, else 0
	Age	Current year minus year the company was listed
	Cash	Cash and its equivalents at the beginning of the period/total assets
	ROE	Current net profit/closing net asset
	Tobin	Year-end market value/book value
	GPM	Gross profit/operating income

TABLE 2: Preliminary description results of China's A-share sample data.

Variable	Obs	Mean	Std. Dev.	Min	Max
Year	10,850	2013.5	2.8724	2009	2018
RD	10,850	0.2422	4.7018	-3.2568	12.6514
FIN	10,849	0.0163	5.3341	-10.1853	21.3375
DTax	10,850	2.1524	0.3287	-5.8245	9.3127
FASS	10,850	0.3056	0.0370	-3.5237	15.8352
Htech	10,850	0.1429	0.3500	0	1
Cash	10,850	0.0160	0.0246	0	1
Age	10,850	9.5000	2.8724	1	34
Lev	10,850	0.6537	0.2645	0	1
Tobin	10,850	0.4766	2.8874	0.2364	9.2
Size	10,850	.0030923	.0360048	0	1
Roe	10,850	0.0256	0.7344	0.0256	0.4225
GPM	10,850	0.1054	0.5123	0.0118	0.9425

Model (3) investigates the impact of accelerated depreciation of fixed assets on corporate deferred income tax:

$$FIN_{it} = \mu_0 + \mu_1 DID + \mu_2 Xlist_{it} + \sigma_{it}. \quad (4)$$

Model (4) investigates the influence of accelerated depreciation tax credit policy on the financial trend of enterprises:

DID = post  $\times$  treat is the processing variable of accelerated depreciation policy for fixed assets; Xlist represents the eight control variables selected in this paper.

## 4. Empirical Results and Analysis

*4.1. The Influence of Accelerated Depreciation Policy of Fixed Assets on Investment Choice and Financialization of Enterprises.* The Chinese government guides the investment of enterprises and vitalizes the real economy through tax reg-

ulation tools and implement accelerated depreciation and tax credit policies for fixed assets in six major industries. It will undoubtedly improve the enthusiasm and willingness of enterprises to increase their R&D investment by providing accelerated depreciation tax credit for the fixed asset investment of manufacturing enterprises, especially for the investment in R&D and capacity expansion, so as to increase the investment in fixed assets and R&D investment of enterprises, obtain the deferred income tax, and then guide the enterprise funds into the field of real economy, inhibit the investment of enterprises in financial assets, and then inhibit the trend of enterprise financialization.

In Table 3, models (1)–(4) are regression models without control variables, and models (5)–((7)) are regression models with control variables. The above models are, respectively, the impact of accelerated depreciation policy on R&D investment, fixed asset investment, deferred income tax, and financialization level. The regression results of the model show that the accelerated depreciation policy of fixed assets has a positive impact on R&D investment and a significant negative impact on corporate finance, whether or not the control variables include. It shows that the policy strengthens the R&D investment of enterprises and suppresses the trend of corporate financialization. Among them, accelerated depreciation of fixed assets significantly reduced the level of financing by about 19.2%, increased R&D investment by about 11.2%, and significantly increased fixed asset investment by about 17% and deferred income tax by 9%.

*4.2. Inspection Based on the PSM-DID Method.* In order to overcome the systematic differences in the treatment effects of depreciation policies between the six industries and other industries, we use the PSM-DID model to further test the robustness of the original hypothesis. Using the PSM-DID method, the tendency score is obtained by regression of virtual variables and control variables of industry attributes. The sample enterprise with the closest tendency score is the

TABLE 3: Impact of accelerated depreciation and tax credit policies for fixed assets.

	(1) RD	(2) FASS	(3) DTax	(4) FIN	(5) RD	(6) FASS	(7) DTax	(8) FIN
DID	0.241*** (0.07)	0.203** (0.02)	0.171*** (0.09)	-0.160*** (0.03)	0.112*** (0.04)	0.170** (0.02)	0.090** (0.04)	-0.192*** (0.05)
Size					0.157 (0.07)	0.281*** (0.09)	0.220*** (0.07)	0.218 (0.05)
Lev					-0.185** (0.03)	-0.229** (0.03)	-0.142** (0.05)	-0.562*** (0.06)
Htech					0.152*** (0.03)	0.320** (0.03)	0.302** (0.05)	0.200*** (0.04)
Age					-0.138 (0.07)	-0.225 (0.06)	-0.341 (0.04)	-0.221*** (0.05)
Cash					0.332*** (0.07)	0.148*** (0.06)	0.225*** (0.04)	0.255*** (0.05)
ROE					0.128*** (0.05)	0.096*** (0.03)	0.242*** (0.06)	0.160*** (0.07)
GPM					0.057* (0.08)	0.020** (0.07)	0.325 (0.05)	0.226 (0.07)
Tobin					0.057 (0.04)	0.020 (0.04)	0.076 (0.06)	0.064 (0.05)
Cons	-1.543*** (0.08)	-2.062*** (0.06)	2.526** (0.09)	3.722*** (0.04)	-4.181** (0.04)	-1.254*** (0.06)	1.528** (0.05)	5.366*** (0.07)
Obs	10850	10850	10850	10850	10850	10850	10850	10850
Samples	1085	1085	1085	1085	1085	1085	1085	1085

Note: \*\*\*, \*\*, and \* are significant, respectively, at the levels of 1%, 5%, and 10%.

control group, which is taken as the comparison object to minimize the systematic differences in the impact of accelerated depreciation policies of enterprises in different industries, so as to reduce the deviation of DID estimation. Before PSM-DID estimation, the validity of the model should be tested.

First of all, we need to test the common support hypothesis ①, that is, whether the experimental group and the control group become balanced after matching, that is to say, whether the mean value of covariates in the experimental group and the control group has significant difference after matching. If there is no significant difference, the PSM-DID method is supported. The test results of the common support hypothesis show that there are significant differences in the indicators of R&D investment, fixed asset investment, and financialization, which proves that the PSM-DID method is reasonable in this paper.

In this paper, the core matching method is used to test whether the accelerated depreciation of fixed assets is robust. Before estimation, we need to test the matching effect of the experimental group and the control group. By drawing the tendency score density function, it is observed that the probability density of the tendency score value of the experimental group and the control group after matching is close, which shows that

the matching effect of this paper is better. Therefore, the feasibility and rationality of the PSM-DID method are further proved on the basis of common support hypothesis.

The results of Figures 1 and 2 show that all the treatment groups have been matched, and a total of 7488 matching samples have been obtained. Further double-difference test is carried out, and the results are shown in Table 4.

Table 4 shows that, after using the PSM-DID method, the accelerated depreciation policy of fixed assets still significantly reduces the trend of enterprise finance; it increased 21.70% of R&D investment and 24.90% of fixed asset investment and reduced 18.80% of financial investment. The result of PSM-DID estimation is still significant, and there is no significant difference between the result of PSM-DID estimation and that of previous DID estimation, which further verifies the hypothesis of this paper and the conclusion of previous DID estimation. It shows that the accelerated depreciation policy of fixed assets strengthens the investment intensity of enterprises in R&D innovation and then restrains the enterprise's financialization.

4.3. *Mechanism Test.* From the above empirical results, it can be seen that accelerated depreciation of fixed assets can

ps match 2 : Treatment assignment	ps match 2 : Common support		Total
	Off support	On support	
Untreated	281	7,488	7,769
Treated	0	3,080	3,080
Total	281	10,568	10,849

FIGURE 1: PSM result.

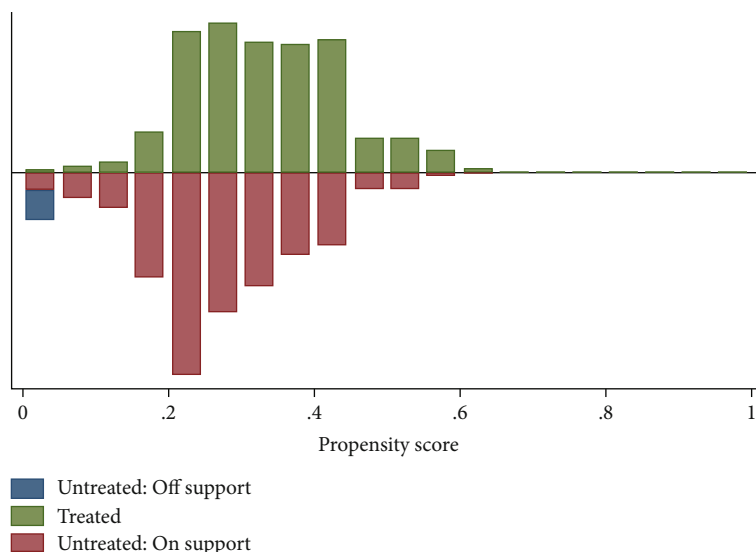


FIGURE 2: Matching density figure.

TABLE 4: Accelerated depreciation of fixed assets and PSM-DID test of corporate financialization.

PSM-DID results	Difference before policy (2014)	Difference after policy (2014)	DID result	Difference before policy	Difference after policy	DID result
Index	RD			FIN		
DID	0.385	0.522	0.137	0.125	-0.002	-0.127
Var	0.066	0.048	0.050	0.067	0.062	0.079
T	15.220	12.640	12.730	14.350	9.160	7.460
P	0.000***	0.216	0.006***	0.000***	0.167	0.002***
Index	FASS			DTax		
DID	0.185	0.253	0.068	0.208	0.166	-0.042
Var	0.231	0.165	0.150	0.158	0.089	0.038
T	13.250	10.180	11.030	11.440	9.760	5.680
P	0.004***	0.112	0.002***	0.024**	0.205	0.033**

Note: \*, \*\*, and \*\*\* are significant at the levels of 10%, 5%, and 1%, respectively.

significantly promote the R&D investment and fixed asset investment of enterprises. To a certain extent, it can also inhibit the financial and investment real estate of enterprises. However, it is still necessary to clarify the impact mechanism of accelerated depreciation policy on R&D investment and

fixed asset investment. We use Baron’s (1986) method for verification.

In this part, three steps are used to verify the guiding effect of accelerated depreciation policy on R&D investment and the restraining effect on corporate finance.

TABLE 5: Mechanism test of accelerated depreciation affecting enterprise financialization.

Dependent	DTax	FIN	FIN	RD	FIN	FIN	FASS	FIN	FIN
DID	1.282*** (0.12)	-0.241*** (0.09)	-0.273*** (0.03)	0.134*** (0.15)	-0.241*** (0.09)	-0.255*** (0.07)	0.055** (0.11)	-0.241*** (0.09)	-0.360*** (0.07)
DTax			0.006*** (0.08)						
RD						0.042*** (0.03)			
FASS									0.108*** (0.07)
Obs	10,850	10,850	10,850	10,850	10,850	10,850	10,850	10,850	10,850
Samples	1085	1085	1085	1085	1085	1085	1085	1085	1085

Note: the first column is coefficient; \*\*\*, \*\*, and \* are significant at the level of 10%, 5%, and 1%, respectively.

- (1) Regression of policy variables and financialization variables. If the coefficient is significant and negative, it indicates that the accelerated depreciation policy restrains the enterprise finance
- (2) The policy variables are regressed with R&D investment, deferred income tax, and fixed asset investment, respectively; if the coefficient is significant, it shows that accelerated depreciation tax deduction has an investment guiding effect
- (3) If the coefficient of policy item is not significant, or the coefficient is reduced, it is proved that the accelerated depreciation policy of fixed assets can restrain the enterprise's financialization by guiding the enterprise's investment into R&D and real assets

According to the above test steps, this paper sets up the verification model of the mechanism of depreciation tax deduction to restrain the enterprise's financialization as follows:

Verify the impact of accelerated depreciation tax credit policy on the investment decision-making direction of the enterprise:

$$DTax_{it}(RD_{it}, FASS_{it}) = \alpha_0 + \alpha_1 DID + \alpha_2 Xlist + \varepsilon_{it}. \quad (5)$$

To verify the effectiveness of accelerated depreciation tax credit policy on enterprise financialization:

$$FIN_{it} = \alpha_0 + \alpha_1 DID + \alpha_2 Xlist + \varepsilon_{it}. \quad (6)$$

Put double-difference term and three investment indexes into regression equation at the same time:

$$FIN_{it} = \alpha_0 + \alpha_1 DID + \alpha_2 DTax_{it}(RD_{it}, FASS_{it}) + \alpha_3 Xlist + \varepsilon_{it}. \quad (7)$$

FIN is the index of enterprise finance, which indicates the ratio of enterprise financial assets to total assets. The data comes from the CSMAR database of guotai'an, and the expected regression coefficient is negative, which indicates

that the accelerated depreciation tax credit policy has restrained the enterprise finance; DID is the product of treat and time; DTax is the growth rate of enterprise's deferred income tax, and the expected regression coefficient is positive, indicating that the accelerated depreciation tax credit policy guides the enterprise to reduce tax on investment and obtain the tax reduction effect of deferred income tax assets; FASS is the growth rate of fixed asset investment of enterprises, and the expected regression coefficient is positive, indicating that enterprises are willing to invest in fixed assets. Xlist is the set of control variables.

The results are summarized in Table 4. In the first step, the regression results show that the coefficient of accelerated depreciation tax credit policy for fixed assets to R&D investment, fixed asset investment, and deferred income tax effect is significantly positive, which shows that accelerated depreciation tax credit policy for fixed assets can significantly promote the investment in fixed assets, R&D investment, and deferred income tax of enterprises, which is in line with our theoretical prediction of this policy.

The second step regression results show that there is a significant negative correlation between the accelerated depreciation tax credit policy of fixed assets and corporate financialization, which shows that the accelerated depreciation policy of fixed assets has a significant inhibitory effect on corporate finance. But what is the way and mechanism to accelerate the depreciation of fixed assets to restrain the enterprise's financialization.

The results of the third step show that, when the three investment variables and policy items are included in the regression equation at the same time, the effect of accelerated depreciation of fixed assets on corporate financialization is still significant, but the coefficient is smaller. The factors of deferred income tax increase the inhibitory effect of corporate finance by 3.2%; R&D investment increase the inhibitory effect 1.4%, and fixed asset 11.9%. Although the increasing range of the restraining effect of each factor on corporate finance is limited, it is enough to show that the three major investment factors significantly reduce the corporate financialization. Table 5 shows the test results of the mechanism of accelerated depreciation affecting corporate finance.



As mentioned above, this result confirms that the accelerated depreciation policy of fixed assets can achieve tax credit effect by guiding enterprises to invest in R&D and fixed assets, thus reducing the investment choice of financial assets and thus inhibiting the mechanism of enterprise financing.

## 5. Conclusion

This paper is based on 10-year panel data of 1085 listed companies in China from 2009 to 2018. Then, we use the PSM-DID method to test the effect of accelerated depreciation policy of fixed assets on R&D investment, fixed asset investment, and deferred income tax, as well as the restraining effect on corporate financialization. The conclusion of this paper shows that the accelerated depreciation policy of fixed assets significantly reduces the level of corporate financialization, and the mechanism verification shows that the accelerated depreciation tax credit policy of fixed assets has increased R&D investment, fixed asset investment, and deferred income tax, thus reducing the investment in the financial field, then restraining the trend of corporate financialization.

The conclusion of this paper is of practical significance to support the formulation and implementation of the structural tax reduction policy and to clarify the regulatory role and mechanism of the structural tax reduction policy. The policy implications of the conclusions are as follows:

- (1) The fixed assets accelerated depreciation tax offsetting policy, reduced the cost of R&D investment, increased the enterprises' confidence of R&D investment, and had a positive effect on R&D investment
- (2) The accelerated depreciation tax credit policy of fixed assets has a significant impact on the investment decision-making of fixed assets for R&D, production and operation, the growth of fixed assets in the main business of the enterprise, and the development of the real economy
- (3) Accelerated depreciation tax credit policy for fixed assets, reduced the enterprise financial asset investment, and restrained the enterprise financialization

In general, the results of this paper clarify the goal of China's accelerated depreciation policy of fixed assets in the field of real economy to focus on R&D, promote development and adjust structure, and provide decision-making basis for the extension of the scope and time of the policy.

## Data Availability

All the data are true and reliable. All data can be obtained by contacting the author.

## Disclosure

Any errors within this paper remain the responsibility of the authors. The views expressed in this paper do not necessarily reflect those of the General Administration of Taxation or the Ministry of Finance of China.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

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