Technology Finance, Property Right Nature and Enterprise Value Added: Based on Difference-in-Difference model

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Keywords: Technology Finance; Enterprise Value Adde; Economic Growth; Difference-in-Difference Model.

Abstract: The Central Committee of the Communist Party of China proposed in the 14th Five-Year Plan to adhere to innovation-driven development and improve the financial support innovation system. Promoting the integration of technology and finance is the core of achieving innovation-driven development, and is of important and far-reaching significance to the overall development of China. This article focuses on all A-share companies from 2014 to 2019, and analyzes the impact of the second batch of technology finance pilot policies on listed companies with different property rights in the pilot area through the difference-in-difference model (DID). Studies have shown that: (1) Technology and financial policies significantly promote the value-added of listed companies in pilot areas; (2) There are significant differences in the impact of technology and financial policies on enterprises with different property rights, and the impact on non-state-owned enterprises is greater than that on state-owned enterprises. Further research finds that the technology and financial policy have significant positive impacts on the economic development of the pilot areas. After parallel trend testing, it is found that the research results are still robust. In order to further promote the integration of technology and finance, and promote enterprise value-added and economic development, local governments should attach great importance to the assistance of technology finance to non-state-owned enterprises, promote enterprises to expand financing, strengthen innovation, and actively give play to the supportive role of policies to enterprises

1. Introduction

On October 29, 2020, at the Fifth Plenary Session of the 19th Central Committee of the Communist Party of China, the Central Committee of the Communist Party of China formulated the 14th Five-Year Plan and the 2035 long-term goal for national economic and social development. The session proposed to insist on innovation-driven development, improve the technological innovation system and mechanism, improve the financial support innovation system, promote the large-scale application of new technology industrialization, improve the modernization level of the industrial chain supply chain, and develop strategic emerging industries. In order to implement the reform of the financial system, it is necessary to improve the financial support innovation system and promote the deep integration of technology and finance.

Technology and finance are closely integrated, that is, technology finance. The term “technology finance” first appeared in China in 1993, when the China Science and Technology Finance Promotion Association was established after the passage of the Science and Technology Progress Law of the People’s Republic of China. However, there was not a clear, complete and scientific definition of technology finance. In 2009, Professor Changwen Zhao proposed the definition of technology finance for the first time. He believed that technology finance is a series of financial tools, financial systems, financial policies, and financial services that promote technological development, transformation of achievements, and the development of high-tech industries. Also, technology finance is a system composed of various entities such as governments, enterprises, markets, and social intermediary agencies that provide financial resources for scientific and technological innovation activities, and

their behaviors in the process of scientific and technological innovation investment and financing. It is an imporant

Part of national scientific and technological innovation system.

The development of science and technology finance is the core of realizing innovation-driven development, and has important and far-reaching significance for the overall development of China. At present, China is in a critical period of adjusting the economic structure and building as an innovative country, facing new challenges such as the quality of economic growth and changes in economic structure. How to develop technology finance, it is the key to promoting high-quality economic and social development in China and building a new pattern of economic development. Technological progress and innovation are important supports for accelerating the transformation of economic development mode, meanwhole, financial development can effectively promote the development and innovation of high-tech technologies. Therefore, technology finance can promote financial capital to participate in scientific and technological innovation activities, diversify scientific and technological innovation risks; and use scientific and technological innovation to improve production efficiency, accelerate the wealth of scientific and technological innovation, and increase revenue. Technology finance is a direct guide for the development of strategic emerging industries and an important way to build an innovative economic society in China.

In order to carry out technological financial innovation practices, the scientific and technological financial policy was officially launched in 2011. The People's Bank of China, the Ministry of Science and Technology and other departments jointly launched the First Batch of Pilots for Promoting the Integration of Technology and Finance in 2011, and 16 pilots for promoting the integration of technology and finance were set up across the country. In recent years, the results have been remarkable and the pilots have played a demonstrative role. At the end of 2015, the five departments further promoted the second batch of pilot projects for promoting the integration of technology and finance, covering Zhengzhou, Xiamen, Ningbo, Jinan, Nanchang, Guiyang, Yinchuan, Baotou and Shenyang, etc. Therefore, based on the quasi-natural experiment of the second batch of technology finance pilot policies, this article studies the impact of technology finance on the value-added effects of listed companies in the pilot areas, and explores in depth the impact of different property rights on the above-mentioned relationship. This has forward-looking and necessary significance for how to promote the construction of a policy of combining technology and finance in cities, promote the common development of enterprises with different property rights, and develop emerging industries.

2. Literature Review and researth hypothesis

2.1 Pilot policy of combining technology and finance

Policy is the soul of technology finance, and the development of technology finance cannot do without policy guidance. The Outline of National Medium and Long-term Science and Technology Development Plan (2006-2020) issued by the State Council in 2006 clearly proposed the establishment of a technology and financial cooperation platform and the implementation of financial policies that promote innovation and entrepreneurship. In 2011, the first batch of pilot projects to promote the integration of technology and finance were officially launched in 16 regions including Shanghai, Wuhan, and Chengdu High-tech area. From 2011 to 2015, more than 350 related policies were issued in pilot areas, and a new investment and financing platform for technological innovation was established, which promoted the continuous strengthening of the foundation of science and technology finance, marking that the combination of technology and finance has entered a stage of rapid development. Under the influence of the first batch of policies, the five departments including the People's Bank of China and the Ministry of Science and Technology carried out the second batch of pilot projects for promoting the integration of technology and finance at the end of 2015, covering Zhengzhou, Xiamen, Ningbo, and Jinan. The nine cities of Nanchang City, Nanchang City, Guiyang City, Yinchuan City, Baotou City and Shenyang City have given more and more important practical

significance to the science and technology financial policy, and have pushed the combination of science and technology and finance to a new level.

Rao Caixia et al. [1] (2013) analyzed China's technology financial policies in depth, analyzed the policies from the perspective of financial tools, and proposed that the core goal of reducing risks and increasing risks and returns should be formed to form a top-down, organically unified science and technology financial policy system. Zhao Qiwei et al. [2] (2014) analyzed government policies through logical reasoning, and discussed the future development of technology finance from three perspectives: the development environment, development focus, and development paradigm of technology finance, concluded that the current development of technology finance should consider 4 Orientation: demand-oriented, market-oriented, industry-oriented, and competition-oriented. Quzhao [3] (2015) conducted a statistical analysis of the number and type of technology financial policy research literature based on the bibliometric method. Through the evolution of themes and the co-occurrence of keywords, he conducted in-depth exploration of the research content and proposed that empirical research should be adopteTechnology Finance and Regional Developmentd. Analyze and compare, and solve the difficulties of each subject in the policy environment in a targeted manner.

2.2 Technology Finance and Regional Development

Zhang Mingxi [4] (2017) used the spatial Dubin model to analyze the spatial spillover effects and performance of technology finance. The research found that the expansion of technology finance directly promotes the improvement of technology finance performance and strengthens the spillover effect of technological innovation to a certain extent. Zhang Zhiruo et al. [5] (2019) used the coupling coordination degree model in 30 provinces and cities in China to analyze the spatial pattern of the coupling coordination degree between the technology financial system and the technological innovation system. The research showed that the spatial correlation of the coupling coordination degree has obvious and seriousegional differences. Ma Lingyuan [6] (2019) used the PSM-DID model to find that the first batch of technology and financial policies had a significant impact on the innovation level of the pilot areas. Xu Yueqian et al. [7] (2021) found through DID model research that the first batch of pilot policies for combining technology and finance can effectively drive economic growth in the pilot areas. Feng Rui et al. [8] (2021) also used the DID model and used the panel data of 283 cities from 2005 to 2017 to find that the implementation of the pilot policy can significantly improve the city's total factor productivity.

2.3 Technology Finance and Enterprise Development

Li Chuntao et al.[9] (2020) used the data of listed companies on the New Third Board of China from 2011 to 2016, found that regional financial technology development has significantly promoted corporate innovation output by mitigating the restraint of financing constraints on corporate innovation and enhancing the innovation effect of tax refunds. Kong Yichao et al. [10] (2020) further studied based on the 2013-2018 NEEQ small and medium-sized high-tech enterprises, using the stochastic frontier analysis method (SFA) based on panel data developed by Battese et al.[11-12](1992) and measured the total factor productivity of the sample enterprises, proposed that the implementation of the technology and finance policy can significantly improve the production efficiency of small and medium high-tech enterprises in the first batch of pilot areas. Wu Jing[13] (2020) used the DID model to show that the first batch of policies that combine technology and finance significantly improved the innovation level of private enterprises in the pilot areas, and the effect of the policy showed an increasing trend. Yu Hongwei et al. [14](2020) also used the DID model to further test the positive promotion effect of the first batch of pilot projects combining technology and finance on the total factor productivity of enterprises. Based on this, this article proposes the following hypothesis:

H1：Technology financial policies have a significant positive impact on the value of enterprises in the pilot areas.

In addition, based on the extensive research of predecessors, the nature of property rights may have an impact on the relationship of enterprise value. Compared with state-owned enterprises, non-state-owned enterprises pay more attention to the minimal improvement of the enterprise, and invest more

in research and development to enhance the value of the enterprise. Moreover, most technology-based small and medium-sized enterprises have relatively poor financing capabilities, and have a stronger and more sensitive response to technology financial policies such as reducing financing constraints and issuing technology loans. Therefore, it is believed that the nature of property rights has a moderating effect on the relationship between technology finance and enterprise value-added. Based on this, this article proposes the following hypothesis:

H2：Compared with state-owned enterprises, the positive effect of science and technology financial policies on the value of non-state-owned enterprises in the pilot areas is more significant.

2.4 Margin Contributions

In summary, previous studies mainly discussed the concept and development characteristics of technology finance through logical reasoning and literature review, put forward some policy interpretations and suggestions. A small amount of research focuses on the impact of technology finance on the regional economy, and mainly uses the DID model to evaluate the impact of pilot policies on the regional economy and innovation performance. There are fewer scholars studying the impact on micro-enterprises, and a small number of scholars have also tried to study how technology finance affects enterprise innovation and total factor productivity through the DID model. However, previous scholars' research was mainly concentrated in the first batch of pilot areas, and ignored the micro-effects of enterprises and the analysis of ownership heterogeneity, and seldom studied the impact of policies on enterprises with different property rights. Therefore, based on the second batch of pilot cities, this article mainly starts from a micro perspective, and uses the DID model to study the response of state-owned enterprises and non-state-owned enterprises to financial policies. On the one hand, it expands the understanding of the impact of the pilot policy from the micro level, and is more accurate. On the other hand, it can also provide targeted policy recommendations for the government to support and guide the high-quality development of enterprises with different property rights.

3. Research Design

3.1 Samles and Data

This article selects China's Shanghai and Shenzhen stock exchanges A-share listed companies from 2014 to 2019 as the research object. At the same time, in order to ensure the validity and rationality of the data, the initial sample is screened and processed as follows: (1) Considering that most of the financial and insurance industries are For off-balance sheet businesses, financial and insurance companies are therefore excluded; (2) ST and *ST companies with abnormal financial data are eliminated; (3) companies with a large number of missing financial data; (4) In order to eliminate the influence of extreme values on the empirical results, this article The continuous variable data has been tailed at the 1% and 99% quantiles. After screening, 3268 sample companies were finally obtained, with a total of 13605 groups of observations. All the data in this paper are from the CSMAR database, and the data analysis is realized by Stata16.0 software.

3.2 Variable Definition

3.2.1 Explained Variable

This article mainly studies the impact of technology finance on the value-added of enterprises, so the explanatory variable is enterprise value. Currently, there are two main types of research on corporate value, property value and market value. This article only discusses market value. This article refers to the practice of most documents and chooses TobinQ as the proxy indicator of the company's market value.

3.2.2 Explanatory Variables

This article mainly studies the impact of the second batch of technology finance pilot policies on the pilot areas, so the explanatory variable is the double difference variable DID that defines the second

batch of technology finance pilot policies. This variable is generated by the intersection of the time variable and the grouping variable. The time variable is a binary variable, the policy pilot year is 0 before 2016, and it is 1 in 2016 and after; the grouping variable is also a binary variable, the non-pilot area is 0, and the pilot area is 1.

3.2.3 Moderating Variable

This article mainly discusses the regulating effect of the nature of property rights, referring to the practice of most documents and setting it as a binary variable, that is, 0 for state-owned enterprises and 1 for non-state-owned enterprises.

3.2.4 Control Variables

Taking into account the impact of other variables on financial performance, this article refers to previous research results to select total assets (Size), net profit (Profits), return on net assets (ROE), operating income growth rate (NPG), equity concentration (Cr10)) As a control variable, in which the total assets are treated as logarithms. The article also controls for individual fixed effects (Industry) and year fixed effects (Year). Please refer to the table below for specific variable definitions.

Table1. The definition of main variables.

Type	Name	Symbol	Definition
Explained Variable	Enerprise value	TobinQ	Market valve/Replacement cost
Explanatory Variables	Time variable	Time	1 if in 2016 and later, 0 otherwise
	Grouping variable	Treat	1 if in the pilot area, 0 otherwise
	DID variable	DID	Time×Treat
Moderating Variable	Nature of property rights	SOE	1 if non-state-owned enterprises, 0 otherwise
Control Variable	Total asset	Size	The natural logarithm of total assets
	Net profit	Profits	Net profit(100 million yuan)
	Return on net assets	ROE	Net profit/Net asset
	Operating income growth rate	NPG	(Operating income of the current period-Operating income of the previous period) / Operating income of the previous period
	Equity concentration	Cr10	The sum of the top ten shareholders' equity/total number of shares
	Individual fixed effect	Ind	Individual dummy variable
	Time fixed effect	Year	Year dummy variable

3.3 Modeling

$$TobinQ = \beta_0 + \beta_1 DID + \beta_3 Controls + \beta_4 Industry + \beta_5 Year + \xi \quad (1)$$

The above formula is a model designed to test the hypothesis H1, in which TobinQ is the explained variable enterprise value, DID is the explanatory variable double difference variable, Controls is various control variables, the model also controls the individual fixed effects and the year fixed effects, and ξ is the disturbance term.

In order to verify the hypothesis H2, since the SOE of property rights is a binary variable, this article draws on the previous research experience and regresses the above formula (1) into groups, which are the state-owned enterprise group and the non-state-owned enterprise group.

4. Results

4.1 Descriptive Statistics

Table 2 is a descriptive statistical table of the main variables in this article. As shown in the following table, the explained variable is TobinQ, with a mean of 2.349 and a standard deviation of 9.014, indicating that the market value of listed companies across the country is quite different. In addition, the descriptive statistical results of other variables are shown in the table.

Table 2. Results of Descriptive Statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
TobinQ	13617	2.349	9.014	0.153	729.629
Size	13617	22.201	1.327	14.942	28.52
Profits	13617	17.321	5.388	0	25.503
ROE	13605	0.044	0.073	-1.859	0.675
NPG	13617	5.181	509.292	-4.401	59411.549
Cash	13605	0.086	0.552	-44.927	15.383
Cr10	13617	59.488	15.047	1.31	101.16

4.2 Correlation Analysis

Table 3 is the correlation analysis table of the main variables involved in this article. As shown in the following table, from the sample, TobinQ is significantly correlated with the three control variables: Size, Profits, and Top10 at the level of 0.01, indicating that the selection of control variables is effective. The correlation coefficient and significance between specific variables are shown in the table.

Table 3. Results of correlation coefficients.

Variables	TobinQ	Size	Profits	ROA	NPG	Cash	Top10
TobinQ	1.000						
Size	-0.149***	1.000					
Profits	-0.050***	0.235***	1.000				
ROA	0.008	-0.005	-0.012	1.000			
NPG	-0.001	0.015*	0.006	0.001	1.000		
Cash	0.004	0.001	0.015*	0.088***	0.000	1.000	
Top10	-0.050***	0.101***	0.204***	-0.033***	-0.023***	0.001	1.000

4.3 Regression analysis

Table 4 is the regression parameter table. According to M1, the technology finance policy has a significant positive effect on the corporate value of listed companies in the pilot area (B=1.127, T=1.97). It can be seen that the implementation of technology finance policy can enable listed companies to expand financing, strengthen innovation, and thereby improve Enterprise value, so that H1 is proven.

As shown in Table 4, according to M2 and M3, in the sample of non-state-owned enterprises, the positive effect of technology and financial policies on the corporate value of listed companies in the pilot area is still significant at the level of 0.01 (B=0.969, T=4.04), while in state-owned enterprises The sample is not significant (B=-0.066, T=-0.23), indicating that the nature of property rights has a significant moderating effect. Non-state-owned enterprises pay more attention to the improvement of corporate performance and value, so H2 is proven.

Table 4. Regression parameter table.

	H1	H2	
	M1(Full Sample)	M2(Non-state-owned)	M3(State-owned)
DID	1.127**	0.969***	-0.066
	(1.97)	(4.04)	(-0.23)
Size	-1.222***	-0.915***	-0.517
	(-16.33)	(-27.62)	(-23.50)
Profits	-0.018	-0.0003	-0.006
	(-1.15)	(-0.07)	(-1.70)
ROE	0.54	0.373	1.125
	(0.41)	(0.77)	(3.23)
NPG	0.0001	0.004*	0.00001
	(0.08)	(1.66)	(0.58)
Cash	-.029	-0.004	0.008
	(-0.21)	(-0.11)	(0.10)
Cr10	-.015**	-0.016***	0.006
	(-2.27)	(-6.33)	(3.12)
Constant	30.61***	23.463***	13.47
	(18.89)	(32.42)	(28.83)
Ind/Year	YES	YES	YES
N	3268	2985	1783
Obs	13605	8977	4268
R^2	0.029	0.124	0.037

5. Furthur Research

Obviously, the policy of combining technology and finance acts on micro-enterprises and other individuals to improve individual innovation capabilities, financial performance, and market value, thereby comprehensively promoting the improvement of the regional economic level. Based on this, the following hypothesis were born in this article:

H3: Technology financial policies have a significant positive impact on the economic development of the pilot areas.

$$GDP = \beta_0 + \beta_1 DID + \beta_2 Controls + \beta_3 Industry + \beta_4 Year + \xi \quad (2)$$

Formula (2) is carried out for estimating H3.The explained variable is the local GDP, and the explanatory variable is still DID. The control variable Controls mainly includes fiscal expenditure (Gov), foreign investment (Invest), infrastructure construction (Basic), fixed asset investment (Fix) and regional population. Count, and on this basis, the individual fixed-effect Industry and the year fixed-effect Year are controlled. ξ is the disturbance term.

According to M4, the technology financial policy has a significant positive impact on the GDP of the pilot area (B=0.064, T=3.23), indicating that the technology financial policy does have an impact transmission mechanism from micro-individuals to macro-economy, so that H3 is proven.

Table 5. Reshots of further regression.

H3	M4 (GDP)
DID	0.064***
	(3.23)

Gov	2.704***
	(22.24)
Invest	-0.097***
	(-4.65)
Basic	-0.008***
	(-5.56)
Fix	-0.147***
	(-9.51)
Count	0.384
	(1.60)
Constant	0.18***
	(13.25)
Ind/Year	YES
N	272
Obs	1373
R^2	0.475

6. Robustness Check

6.1 Parallel Trend Test

Based on the consideration of robustness, this paper conducts a parallel trend test. As shown in the figure below, the trend of changes in TobinQ and regional GDP averages of listed companies in pilot areas and non-pilot areas are compared.

In Figure 1, the micro-parallel trend shows that the TobinQ value of listed companies in non-pilot areas has been higher than that in pilot areas before 2016, and the development trend is the same. In 2017 and after, the growth rate of pilot areas was significantly higher than that in non-pilot areas, and it exceeded that in 2019. Non-pilot area. It shows that the two have parallel trends before 2016, but after the implementation of the policy in 2016, it has had a positive impact on the value of listed companies in the pilot areas.

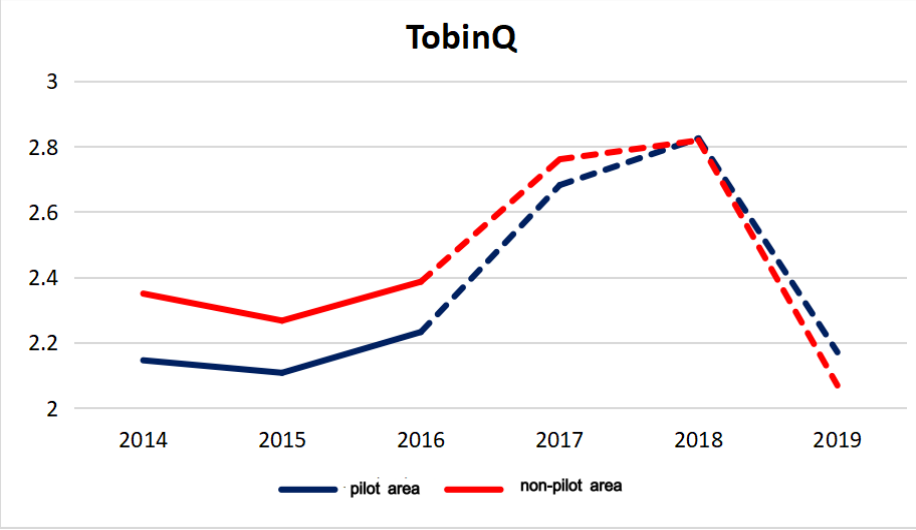

Figure 1. Micro parallel trends.

As shown in the macro parallel trend shown in Figure 2, the non-pilot area's change trend before 2016 is the same as the pilot area, and the shift finds that the two are almost the same. In 2017 and after, the growth rate of the average GDO of the pilot area is significantly higher than that of the non-pilot area. It shows that the two have parallel trends before 2016, but the implementation of the policy in 2016 has had a positive impact on the GDP of the pilot areas.

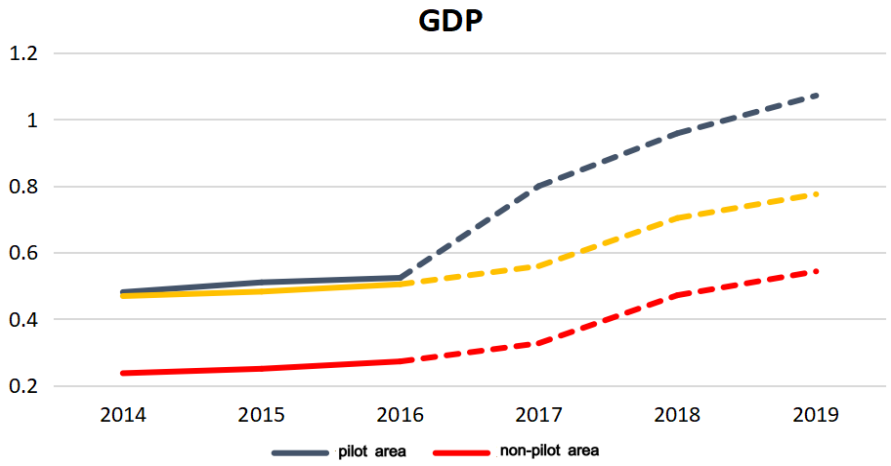

Figure 2. Macro parallel trends.

6.2 Counterfactual Test

In addition, this article randomly selects 11 other provincial capital cities as pilot areas for counterfactual testing in an attempt to eliminate other policy interference and reduce endogenous problems. Table 6 is the result table of counterfactual test, which mainly tests the main content of this paper, that is, the problem of enterprise value-added.

As shown in the table, it can be seen from M1, M2, and M3 that whether it is a full sample, or a non-state-owned enterprise group or a state-owned enterprise group, when the pilot cities are randomly changed, the intersection of time and grouping variable DID is no longer significantly related with the value of the enterprise. It shows that other pilot policies are not the cause of this effect, and the interference and endogenous problems of other policies have been eliminated. Therefore, the study believes that the implementation of the pilot policy attributable to the technological finance is sound.

Table 6. Results of Counterfactual Test.

	H1	H2	
	M1(Full sample)	M2(Non-state-owned)	M3(State-owned)
DID	0.026	0.024	0.023
	(0.06)	(0.14)	(0.16)
Size	-1.194***	-0.894***	-0.517***
	(-16.24)	(-27.27)	(-23.48)
Profits	-0.019	-0.001	-0.006*
	(-1.18)	(-0.20)	(-1.71)
ROE	0.466	0.32	1.127***
	(0.35)	(0.66)	(3.24)
NPG	0.00001	0.004*	0.00001
	(0.07)	(1.67)	(0.58)
Cash	-0.031	-0.005	0.008
	(-0.22)	(-0.13)	(0.10)
Cr10	-0.015**	-0.017***	0.006***
	(-2.37)	(-6.60)	(3.13)
Constant	30.088***	23.078***	13.464***
	(18.81)	(32.12)	(28.76)
Ind/Year	YES	YES	YES
N	3268	2985	1783
Obs	13605	8977	4268
R^2	0.029	0.122	0.186

7. Conclusions

This article regards the second batch of pilot policies for integration of technology and finance set up by the Ministry of Science and Technology and the People's Bank of China as a quasi-natural experiment. Based on the number of listed companies in the 10 pilot regions from 2014 to 2019, the double difference method is used to analyze technology the impact and heterogeneity of the financial integration pilot policy on the listed companies in the pilot area. The research in this paper shows that: First, the scientific and technological financial policy has a significant positive effect on the corporate value of listed companies in the pilot area, and this conclusion is robust. Second, through the heterogeneity test, it is found that the nature of property rights has a significant regulatory effect, and the scientific and technological financial policy has a more significant role in promoting non-state-owned enterprises. Third, science and technology financial policies can significantly promote the economic development of pilot areas.

The research conclusions of this article have important policy implications: (1) Technology and financial policies can promote listed companies in pilot areas to expand financing and strengthen innovation, thereby enhancing corporate value and promoting regional economic development. Therefore, the implementation of pilot policies for technology and finance should be promoted on a larger scale to promote enterprise development and regional development; (2) from the perspective of the effect of state-owned enterprises and non-state-owned enterprises on the policy response, the pilot city construction policy of combining technology and finance should be appropriately tilted to non-state-owned enterprises. Because the pilot policy has a more significant positive effect in non-state-owned enterprises, it is more necessary for the government to play an active support role in financing loans.

References

[1] Rao C X, Tang W X, Zhou F Y. Analysis and System Construction of China's Science and Technology Finance Policy[J].Science and Technology Management Research, 2013,33(20):31-35.(in Chinese)

[2] Zhao Q W, Fu J, Liu H J. Key Issues in Technology Finance——Summary of China Technology Finance 2014 Annual Conference[J].Management World,2015(03):164-167.(in Chinese)

[3] Qu Z, Ding X, Zhang C B. Research on Science and Technology Finance Policy Based on Bibliometric Perspective[J].Technological progress and countermeasures,2015,32(13):123-128.(in Chinese)

[4] Zhang M X. An Empirical Study on China's Science and Technology Finance Ecology and Its Performance [J].Technological progress and countermeasures, 2017, 34(16):14-19. (in Chinese)

[5] Zhang Z R, Gu G F. Analysis of the spatial pattern of the degree of coupling and coordination between technology finance and technology innovation[J].Economic geography,2019,39(04):50-58.(in Chinese)

[6] Ma L Y, Li X M. Does the science and technology finance policy promote the improvement of regional innovation level?——Based on the quasi-natural experiment of promoting the pilot project of combining science and technology with finance [J].China Soft Science,2019(12):30-42.(in Chinese)

[7] Xu Y Q, Li T, Lu L L. Research on the Impact of the Pilot Policy of Combining Technology and Finance on Regional Economic Growth —— Based on the Perspective of Scientific and Technological Innovation and the Rationalization of Industrial Structure[J / OL]. Journal of Chongqing University (Social Science Edition): 1-14 [2021-04-23].http:// kns.cnki.net/ kcms/ detail /50.1023.c.20210310.1730.002.html. (in Chinese)

[8] Feng R, Ma Q S, Liu C M. The Impact of the Combination of Technology and Finance on Total Factor Productivity —— Based on the Empirical Evidence from the Quasi - Natural Experiment of Promoting the Pilot Combination of Technology and Finance [J / OL]. Technological progress and countermeasures: 1-9 [2021-04-23]. Http: // kns.cnki.net / kcms / detail / 42.1224.G3.20210406. 1718.020. Html. (in Chinese)

[9] Li C T, Yan X W, Sone W, Yang W. Fintech and Corporate Innovation-Evidence of Listed Companies on the New Third Board[J].China Industrial Economic,2020(01):81-98.(in Chinese)

[10] Kong Y C, Zhou D. Research on the Effect and Influence Mechanism of Sci-tech Finance Pilot Policies from the Perspective of Enterprise Productivity -- Based on the Empirical Test of Enterprises on the New Third Board[J].Financial theory and practice,2020(10):28-37. (in Chinese)

[11] Battese G E, Coelli T J. Frontier Production Functions, Technical Efficiency and Panel Data: With Application to Paddy Farmers in India [J]. Journal of Productivity Analysis, 1992, 3(1/2): 153-169.

[12] Aigner D, Lovell C a K, Schmidt P. Formulation and Estimation of Stochastic Frontier production Function Models [J]. Journal of Econometrics, 1977, 6 (1):21-37.

[13] Wu J. The impact of science and technology finance on the innovation of private enterprises: a quasi-natural experiment based on the construction of a pilot city combining science and technology with finance[J].Financial theory and practice,2020(01):27-32. (in Chinese)

[14] Yu H W, Wang J S, Zhang X. Does the combination of technology and finance promote the high-quality development of technology-based SMEs? [J].Investment Research, 2020, 39 (10):128-151. (in Chinese)