

The Financialization of Real Enterprises and Enterprise Innovation

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Abstract

In recent years, many enterprises have a moderate amount of financial assets in order to obtain innovative research and development funds. Based on the influence of financialization of entity enterprises on the level of enterprise innovation investment, this paper finds that enterprise financialization will promote the level of enterprise innovation investment. Further considering the property right nature of enterprises and whether they are high-tech enterprises, it is found that compared with state-owned enterprises and high-tech enterprises, the influence of corporate financialization on the level of innovation investment is more significant in non-state-owned enterprises and high-tech enterprises.

Keywords

Degree of Financialization; Enterprise Innovation; Differentiation of Enterprises.

1. Introduction

At present, the development of our real economy suffers from bottlenecks and is increasingly depressed. Many private enterprises in society face losses or even bankruptcy due to the difficulty in adapting to the changes of economic development [1]. However, in recent years, China's virtual economy has developed rapidly. By 2016, the proportion of virtual economy in GDP reached 14.9%, among which the proportion of financial industry in GDP reached 8.4% [2], which has exceeded the level of developed countries with mature financial systems including the United States and Japan [3]. These data show that China's real economy shows a relatively obvious trend of excessive financialization. At present, our economy has shifted from a phase of rapid growth to a phase of high-quality development, and we are now in a period of transition from a mode of development, to optimizing economic structure and to transforming growth drivers. Only by building a modern economy can we effectively respond to risks and challenges and lay a solid foundation for high-quality development. Only by boosting the real economy can we lay a solid foundation for a modern economic system.

The real economy is the main relying on the innovation development. The financial market can provide a large amount of financial support for the enterprises that carry out the innovation development strategy. However, if enterprises invest a large amount of funds in real estate, finance and other virtual economy, it will relatively reduce the amount of funds invested in innovation and research and development of enterprises, which will inhibit the innovative development of enterprises, thus hindering the trend of enterprise innovation and development. Most of the existing literature focuses on the relationship between financialization of real enterprises and real investment, information efficiency of capital market, market competition, etc., while few literatures focus on the impact of financialization of real enterprises on the level of innovation investment [4-6]. Based on this, this paper selects China's

A-share listed companies from 2012 to 2015 as the main research samples to study the impact of financialization of entity enterprises on the level of enterprise innovation investment, and further investigates the impact of corporate financialization on the level of innovation investment of enterprises with different property rights and whether they belong to high-tech industry. It is found that the financialization of entity enterprises will promote the level of enterprise innovation investment. And this positive correlation is more significant in non-state-owned enterprises and high-tech industries.

The research contributions of this paper are as follows: First, it enriches the literature related to the financialization of entity enterprises. Previous studies on the relationship between the financialization of entity enterprises and enterprise innovation have drawn inconsistent conclusions. Some scholars believe that there is a significant negative correlation between the two [7]. Some scholars believe that corporate financialization will promote corporate innovation. This paper supports the latter view; Second, it enriches the relevant literature on the level of enterprise innovation investment. Existing literatures mainly study the influence of executive compensation stickiness, employee stock ownership plan and bank association on the level of enterprise innovation investment. This paper mainly analyzes the influence of the financialization of entity enterprises on the level of enterprise innovation investment. Thirdly, this paper further enriches the research of micro enterprise behavior under the macro background. Under the background of China's special system, whether it is a state-owned enterprise or high-tech industry has different significant influences on the relationship between them. In addition, different degrees of corporate financialization have different impacts on innovation investment activities.

The structure of the paper is as follows: the second part is the literature review and theoretical analysis, so as to put forward the main research hypothesis of this paper; The third part is the basic introduction of the research samples, data sources and research design. The fourth part is the empirical analysis results and robustness test of this paper. Finally, the conclusion and revelation.

2. Theoretical Analysis and Research Hypothesis

2.1. Enterprise Financialization and the Level of Enterprise Innovation Investment

The financialization of real enterprises refers to the fact that real enterprises obtain investment returns through their financial assets, thus increasing the total profits of enterprises and forming the abnormal phenomenon that corporate financial investment constantly exerts a great influence on the daily business activities of enterprises [8]. Entity enterprises are the main body of innovation activities, and the smooth implementation of innovation activities generally requires the financial returns generated by production and operation activities and the financial assistance provided by government departments [9]. Due to the characteristics of enterprise innovation activities such as long R&D cycle, large R&D risks and unstable returns, enterprises need to continuously invest a large amount of basic funds to support their innovation activities, which is very easy to cause the lack of funds [10]. Therefore, enterprises' innovative activities for sustainable operation and market position require enterprises to allocate their internal funds reasonably. If enterprises have unreasonable fund allocation activities, it may lead to the suspension or even interruption of their innovation activities, thus causing them to suffer heavy losses.

Some scholars believe that financial investment activities of enterprises can bring positive cash inflow to enterprises, which will increase the cash flow of enterprises invested in innovative activities, that is, the financialization of entity enterprises does not necessarily play a completely negative role in the tampering of new activities of enterprises. Song Jun and Lu Yang

analyzed the relationship between the financial assets held by A-share listed companies and their operating returns from 2007 to 2012, and found that there was a U-shaped relationship between the two, that is, enterprises tended to hold more financial assets regardless of their performance. Enterprises with low performance were mainly represented by substitution effect, while enterprises with high performance were mainly represented by surplus effect [11]. In addition, some scholars have found that corporate financial reform is conducive to reducing the financing constraint pressure of enterprises, thus benefiting enterprises' innovative investment activities [12]. In a word, corporate financialization will have a significant impact on the level of corporate innovation activities. Therefore, this paper proposes two competing research hypotheses:

H1a: There is a positive correlation between financialization of entity enterprises and the level of enterprise innovation investment, that is, enterprise financialization will promote enterprise innovation.

H1b: There is a negative correlation between entity enterprise financialization and enterprise innovation investment level, that is, enterprise financialization will inhibit enterprise innovation.

2.2. The Influence of the Degree of Financialization of Different Types of Enterprises on the Level of Enterprise Innovation Investment

Our special institutional environment may lead to the difference of enterprises with different property rights in many aspects, such as financing ability, government support, etc., which will lead to the difference of the degree of corporate financialization on the level of innovation investment under the background of enterprises with different property rights. Yang Zheng et al. believe that banks prefer to lend to state-owned enterprises, because state-owned enterprises have high credit and guarantee degree, which directly leads to state-owned enterprises being able to borrow more credit funds at lower credit cost, while non-state-owned enterprises are more constrained by financing [13]. Under the special system background of our country, non-state-owned enterprises may temporarily invest part of their funds in the financial market, thus obtaining more funds to support the enterprise innovation activities. In addition, since state-owned enterprises bear the responsibility of maintaining social development and economic stability, the government will issue more funds to state-owned enterprises to support the smooth progress of their innovation activities, while non-state-owned enterprises do not have direct political relations with the government and banks, so it is difficult to obtain government funds to support enterprise innovation. Therefore, non-state-owned enterprises are more inclined to invest in the financial market to obtain sufficient funds needed for innovation. Therefore, this paper puts forward hypothesis 2:

H2a: Compared with state-owned enterprises, the financialization of non-state-owned enterprises plays a more significant role in promoting the innovation investment activities of enterprises.

H2b: Compared with state-owned enterprises, the financialization of non-state-owned enterprises has a more significant inhibitory effect on the innovation investment activities of enterprises.

2.3. The Influence of the Degree of Firm Financialization in Different Industries on the Level of Firm Innovation Investment

Enterprises in different industries have different demands for innovation activities, and the differences between industries will also affect the amount of financial assets owned by enterprises. On the one hand, compared with non-high-tech industries, the market competition between high-tech industries is more fierce, and enterprises in high-tech industries will choose to carry out continuous innovation investment activities to increase their market

competitiveness [14]. As a result, companies in the high-tech sector have a stronger incentive to innovate. On the other hand, enterprises in non-high-tech industries have low demand for innovation. Corporate executive compensation is mainly proportional to corporate performance, while corporate performance in non-high-tech industries is mainly derived from their daily business activities, which is not strongly correlated with innovation. Liu Yunguo and Liu Wen found that the tenure of senior executives in high-tech enterprises and non-high-tech enterprises also has a significant difference in the impact on R&D expenditure [15]. Liu Wei and Liu Xing also found that equity incentives promote R&D investment only in companies in high-tech industry [16]. Therefore, hypothesis 3 is proposed in this paper:

H3a: Compared with non-high-tech industries, corporate financialization in high-tech industries plays a more significant role in promoting corporate innovation investment activities.

H3b: Compared with non-high-tech industries, corporate financialization in high-tech industries has a more significant inhibitory effect on corporate innovation investment activities.

3. Study Design

3.1. Data Source and Sample Selection

In view of the requirements of the Ministry of Finance, from 2017, the measurement of financial assets, presentation and other standards have undergone major changes. In this paper, all China's A-share listed companies from 2012 to 2015 are selected as research samples, and the following conditions are adopted to screen the samples: (1) Financial listed companies are excluded; (2) Excluding listed companies with ST during the study period; (3) Samples that did not disclose R&D expenditure and other relevant R&D information during the study period were excluded; (3) Samples with missing observed values of other control variables were eliminated. Finally, 1164 listed companies were obtained, with a total of 3905 sample observations. The R & D data used in this paper are from the Wind database, and the remaining control variables related to corporate finance and corporate governance are from the CSMAR database.

3.2. Definition and Description of Variables

The explained variable was firm innovation investment level (RD1). The existing literature generally uses two indexes of innovation input and innovation output to measure the level of enterprise innovation investment. Referring to previous literature [5][7], this paper also adopts the intensity of R&D investment to measure the level of enterprise innovation investment, specifically the proportion of R&D expenditure in total assets (RD1). The larger the RD2 value is, the higher the degree of enterprise innovation is.

The main explanatory variable was corporate financialization (Fin). The proportion of financial assets held by enterprises in total assets measures the degree of financialization of enterprises. The specific calculation formula is as follows:

$$F = \frac{A + B + C + D + E + F}{G} \quad (1)$$

In the above equation, F is corporate financialization, A is transactional financial assets, B is derivative financial assets, C is net loans and advances, D is net financial assets available for sale, E is net hold-to-maturity investment, F is net investment real estate, and G is total assets.

Referring to previous literature [2][5][7], this paper controls the corporate characteristics and governance variables that affect the level of enterprise innovation investment. See Table 1 for

all variables and their definitions. In addition, this paper also controls the industry effect and the annual effect.

Table 1. Variables and variable definition table (1) (a)

Numble	Symbol of variable	Definition of variables
Explained variable		
Research and development investment	RD1	The proportion of the company's R&D expenditure to its total assets in that year
	RD2	The proportion of the company's research and development expenditure to its operating revenue for the year
The degree of corporate financialization	FIN	$F = \frac{A + B + C + D + E + F}{G}$

Table 1. Variables and variable definition table (2) (b)

Variable of control		
Nature of property right	SOE	For state-owned enterprises, the value is 1, and for others, the value is 0
Years of listing	AGE	The natural logarithm of the number of years a company has been public
Size of Enterprise	SIZE	The natural log of total assets at the end of the year
Concentration of ownership	TOP1	Share of the top five shareholders
Size of board of Directors	BOARD	Total number of Directors
Asset-liability ratio	LEV	Total liabilities as a percentage of total assets
Degree of capital intensity	FIXED	The proportion of fixed assets to total assets at the end of the period
Return on assets	ROA	The ratio of ending net profit to average total assets
Operating revenue growth rate	GROWTH	(Current period operating income - previous period operating income)/Previous period operating income
Cash holding level	CASH	Cash as a percentage of total assets at year-end
Annual effect	YEAR	Dummy variable of year
Effect of industry	INDUSTRY	Dummy variable of industry

3.3. Research Model

This paper builds the following model to test hypothesis 1, that is, the impact of corporate financialization on corporate innovation investment activities.

$$RD_1 = \alpha_0 + \alpha_1 Fin + \Sigma Controls + \varepsilon \tag{2}$$

Where, RD1 is the proxy variable of the innovation investment level of an enterprise, α_1 is the proportion of R&D expenditure in total assets of an enterprise in the current year. Fin measures corporate financialisation. Controls represent all of the above control variables, and epsilon is the error term. This paper focuses on the positive and negative signs of α_1 . If α_1 is positive, it indicates that enterprise financialization will promote enterprise innovation. On the contrary, the financialization of enterprises will inhibit the innovation of enterprises.

4. Empirical Test and Result Analysis

4.1. Descriptive Statistics, Correlation Analysis and Univariate Mean Test

Table 2 shows the descriptive statistical results of the main variables in this paper. On average, the ratio of enterprise innovation investment to total assets (RD1) is about 2.2%, and the ratio of enterprise operating income (RD2) is about 4.8%. In addition, the mean value (0.022, 0.048) and maximum value (0.095, 0.276) of R&D input (RD1, RD2) have a large difference, indicating that the R&D input of Chinese A-share listed companies is relatively insufficient and has a large difference, which is similar to the descriptive statistical results of previous literatures. The mean and median values of financialization degree (Fin) are 0.017 and 0.001, respectively, indicating that at least half of the enterprises hold financial assets, and some enterprises hold a high proportion of financial assets, that is, the degree of financialization varies greatly among enterprises, which is in line with the current situation of Chinese enterprises. Descriptive statistics for other control variables are not illustrated.

Table 2. Descriptive statistics of major variables

variable	N	Mean	sd	p50	min	max
Fin	3905	0.017	0.040	0.001	0.000	0.233
RD1	3905	0.022	0.017	0.019	0.000	0.095
RD2	3905	0.048	0.048	0.036	0.000	0.276
Soe	3905	0.077	0.266	0	0	1
Size	3905	21.417	0.887	21.317	19.693	24.474
Top5	3905	54.313	14.517	55.389	19.928	83.605
Board	3905	8.266	1.470	9	4	17
Lev	3905	0.340	0.194	0.316	0.033	0.834
Roa	3905	0.042	0.049	0.041	-0.158	0.179
Age	3905	1.464	0.888	1.469	-1.124	3.069

Table 3 shows the Pearson and Spearman correlation coefficients of main variables except the control variables. Taking RD1 as an example, in terms of correlation coefficient, the coefficients among financialization degree (Fin), R&D investment (RD1), property right nature (SOE) and industry characteristics (TECH) are all much lower than 0.5. Therefore, it can be considered that there is no multicollinearity among major variables. In addition, there is a significant correlation between the degree of financialization and R&D investment, which is basically consistent with the hypothesis. See the regression analysis later for details.

Table 3. Matrix of correlation coefficients for major variables

	Fin	RD1	Soe	Tech
Fin	1	-0.088***	0.092***	-0.063***
RD1	-0.048***	1	-0.200***	0.284***
Soe	0.046***	-0.146***	1	-0.066***
Tech	-0.058***	0.270***	-0.066***	1

Note :***p < 0.01, **p < 0.05, *p < 0.01. The lower left (upper right) corner is the Pearson (Spearman) correlation coefficient.

Table 4 and Table 5 shows the results of univariate mean test. Among them, the innovation input level of non-state-owned enterprises (RD1, RD2) is significantly higher than that of state-owned enterprises, and there is also a significant difference in the degree of financialization between the two, which is consistent with the differences previously stated, preliminarily indicating that the degree of influence of non-state-owned enterprises' financialization on the level of enterprise innovation investment is more significant. In addition, the differences in the level of innovation investment and the degree of financialization of enterprises in non-high-tech industries are consistent with the above, which preliminarily indicates that the degree of influence of the financialization of enterprises in high-tech industries on the level of innovation investment is more significant.

Mean value of non-State-owned enterprises Mean value difference of state-owned enterprises

Table 4. Univariate mean test (1)

Variable name	Mean value of non-State-owned	Mean value	State-owned enterprise	Mean value	Difference in mean
RD1	3606	0.023	299	0.014	0.009***
RD2	3606	0.051	299	0.026	0.025***
Fin	3606	0.017	299	0.026	-0.009***

Table 5. Univariate mean test (2)

Variable name	Non-high-tech industries	Mean value	High tech industry	Mean value	Difference in mean
RD1	2195	0.018	1710	0.028	-0.010***
RD2	2195	0.035	1710	0.068	-0.033***
Fin	2195	0.021	1710	0.015	0.006***

4.2. Analysis of Empirical Results

This paper first examines the relationship between firm financialization and firm innovation investment level, and the results are shown in Table 6. When RD1, that is, the proportion of R&D expenditure in total assets of the current year, is used to measure the level of enterprise innovation investment, the results show that the coefficient between enterprise financialization and enterprise innovation investment is 0.0124, and is significantly positive at the significance level of 5%, indicating that enterprise financialization is positively correlated with enterprise innovation investment activities. That is, enterprise financialization will promote enterprise innovation, assuming H1a is established.

Table 6. Degree of financialization and investment in innovation

Numble	Name	Value	Numble	Name	Value
1		RD1	8	Top5	0.0000
2	Fin	0.0124**	9		[0.0000]
3		[0.0054]	10	Board	0.0007***
4	Soe	-0.0035**	11		[0.0002]
5		[0.0017]	12	_cons	0.0909***
6	Size	-0.0037***	13		[0.0112]
7		[0.0004]	14	N	3905

Table 7 mainly reports the influence of the degree of financialization of enterprises with different property rights on the level of innovation investment. As shown in Table 6, the regression coefficient of financialization degree and innovation input of non-state-owned enterprises is 0.0154, and is significantly positive at 1% significance level, while the regression coefficient of non-state-owned enterprises is not significant. It can be seen that, compared with state-owned enterprises, the degree of financialization of non-state-owned enterprises has a more significant positive correlation with the level of enterprise innovation investment, that is, the financialization of non-state-owned enterprises has a more significant promoting effect on enterprise innovation investment activities, assuming H2a is established.

Table 7. Variables and variable definition table

	Mean value of non-State-owned	State-owned enterprise	Non-high-tech industries	High tech industry
	RD1	RD1	RD1	RD1
Fin	0.0154***	-0.0099	0.00625	0.0199**
	[0.0057]	[0.0184]	[0.0060]	[0.0101]
Size	-0.0043***	0.0007	-0.00255***	-0.00611***
	[0.0004]	[0.0016]	[0.0005]	[0.0008]
Top5	0.0000	0.0001	0.0000317	0.0000260
	[0.0000]	[0.0001]	[0.0000]	[0.0000]
Board	0.0006***	0.00288***	0.000931***	0.000469
	[0.0002]	[0.0009]	[0.0002]	[0.0004]
_cons	0.1044***	0.0000	0.0649***	0.153***
	[0.0116]	[.]	[0.0113]	[0.0185]
N	3606	299	2195	1710

Table 7 also reports the influence of the degree of firm financialization in high-tech industry on the level of firm innovation investment. As shown in Table 6, the regression coefficient of enterprise financialization degree and enterprise innovation input in high-tech industry is 0.0199 and significantly positive at the significance level of 5%, while the regression coefficient of enterprise financialization degree and enterprise innovation input in non-high-tech industry is not significant. It can be seen that, compared with enterprises in non-high-tech industries, there is a more significant positive correlation between the degree of enterprise financialization in high-tech industries and the level of enterprise innovation investment, that is, enterprise financialization in high-tech industries has a more significant promoting effect on enterprise innovation investment activities, assuming that H3a is established.

4.3. Analysis of Robustness

Re-measuring the level of enterprise innovation investment. With reference to previous literatures, the ratio of R&D expenditure to operating income (RD2) of the current year is used as the proxy variable of the innovation investment level of enterprises. The results are shown in Table 8. The correlation coefficient between the degree of enterprise financialization and the level of enterprise innovation investment is 0.0272, and it is significantly positive at the significance level of 10%, which is similar to the previous results of the main regression, again proving the validity of hypothesis H1a. In addition, similar to the previous grouping results, compared with state-owned enterprises, the financialization of non-state-owned enterprises will promote the level of enterprise innovation investment, assuming that H2a is true. However,

the grouping regression results of high-tech industry are not significant, which may be due to the small sample size. Grouping regression results are shown in Table 9.

Table 8. Enterprise financialization and Enterprise innovation

Numble	Name	Value	Numble	Name	Value
1		RD2	8	Top5	-0.0000229
2	Fin	0.0272*	9		[0.0001]
3		[0.0150]	10	Board	0.000793
4	Soe	-0.00722	11		[0.0006]
5		[0.0046]	12	_cons	0.224***
6	Size	-0.00727***	13		[0.0309]
7		[0.0012]	14	N	3905

Table 9. Whether it is the grouping of state-owned enterprises and high-tech industries

	Mean value of non-State-owned	State-owned enterprise	Non-high-tech industries	High tech industry
	RD2	RD2	RD2	RD2
Fin	0.0358**	-0.0123	0.0232	0.0328
	[0.0164]	[0.0358]	[0.0142]	[0.0315]
Size	-0.0075***	0.0003	-0.0036***	-0.0121***
	[0.0013]	[0.0033]	[0.0011]	[0.0023]
Top5	-0.0000	0.0002	-0.0000	-0.0000
	[0.0001]	[0.0002]	[0.0001]	[0.0001]
Board	0.0005	0.0033*	0.00143**	0.0001
	[0.0006]	[0.0017]	[0.0006]	[0.0011]
_cons	0.2315***	0	0.1448***	0.2646***
	[0.0328]	[.]	[0.0267]	[0.0550]
N	3606	299	2195	1710

This paper uses panel data and controls the individual effects of firms, alleviating some of the endogeneity problems. The results are shown in Table 10, and the results are similar to before.

Table 10. Regression results after controlling for individual effects

Numble	Name	Value1	Value2	Numble	Name	Value1	Value2
1		(1)	(2)	14		[0.0008]	[0.0024]
2		RD1	RD2	15	Roa	-0.0005***	-0.0010**
3	Fin	0.0122**	0.0278*	16		[0.0001]	[0.0004]
4		[0.0060]	[0.0165]	17	Age	0.0011	0.0035*
5	Soe	-0.0018	-0.0054	18		[0.0007]	[0.0019]
6		[0.0035]	[0.0098]	19	Growth	0.0001	-0.0002*
7	Size	-0.0071***	-0.0079***	20		[0.0000]	[0.0001]
8		[0.0007]	[0.0018]	21	Fixed	0.0016	0.0136*
9	Top5	0.0001***	0.0001	22		[0.0028]	[0.0079]
10		[0.0000]	[0.0001]	23	_cons	0.1707***	0.2022***
11	Board	0.0007***	0.0012*	24		[0.0162]	[0.0448]
12		[0.0003]	[0.0007]	25	N	3905	3905
13	Lev	-0.0049***	-0.0097***	26	adj. R-sq	0.3311	0.3942

5. Conclusion

Innovation investment requires enterprises to invest a steady flow of research and development funds, and one of the reasons for enterprises to hold financial assets is to obtain investment returns, namely positive cash flow. Therefore, it can be preliminarily found that there is a certain relationship between enterprise financialization and enterprise innovation. Therefore, this paper studies the impact of the financialization of entity enterprises on the level of enterprise innovation investment, and finds that the financialization of enterprise will promote the level of enterprise innovation investment. This paper further finds that the promoting effect between firm financialization and firm R&D investment is more significant in non-state-owned enterprises and high-tech enterprises. The conclusion shows that having the right amount of financial assets is indeed beneficial to the smooth progress of innovation activities.

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