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Research on the Influence of Real Estate Investment on Industrial Enterprise Innovation

Zhang Wang[1,a,*], Cong Tianyu[2,b], Ying Hongcun[3,c]

[1]*School of Economics and Management, North China University of Technology, No. 5, Jinyuanzhuang Road, Beijing, China*
[2]*School of Economics and Management, North China University of Technology, No. 5, Jinyuanzhuang Road, Beijing, China*
[3]*School of Economics and Management, North China University of Technology, No. 5, Jinyuanzhuang Road, Beijing, China*
[a]*1561741839@qq.com*, [b]*1748767536@qq.com*, [c]*yhc3171483@163.com*

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Abstract: Inovation is the source power of enterprise development. In recent years, under the double squeeze of overcapacity and insufficient consumption, the phenomenon of industrial enterprises keen on real estate investment has become increasingly prominent. Based on Shanghai and Shenzhen two city industry listed companies in 2012-2021 data sets, using fixed effect model to estimate and mixed regression model to the regression analysis found that the enterprise of real estate investment will form apparent extrusion, the resources available to the enterprise, in turn, the impact of risk degree of stability of the enterprise, is not conducive to enterprise's own technology innovation investment. At the same time, using the proportion of academic directors among independent directors as a moderating variable, it is found that academic independent directors can inhibit industrial enterprises from investing in real estate.

1. Introduction

Since the housing reform in 1998, the real estate industry has been booming, and listed industrial companies have also entered the industry, making the scale of investment in the real estate industry increasingly expanded. What direction and degree of influence will this behaviour have on the technological innovation of the main business of enterprises?

Many scholars have measured the impact of real estate investment on economic growth from different perspectives. Deng Bowen (2014), Mi Xuming (2020), Wang Zhongrun and Wen Liyao (2019), Feng Jie and Sun Hui (2021) all believe that real estate investment has positive and negative effects on enterprise innovation. On the one hand, it inhibits enterprise innovation input, and on the other hand, it has a "compensation effect" on enterprise profit [1-4].

Throughout the existing literature, there are still some shortcomings. First, there is little research on the impact of enterprise investment real estate on enterprise innovation from the micro perspective. Second, there is little in-depth discussion on the impact of individual factors such as

entrepreneurs and independent directors on enterprise innovation in decision-making. This paper studies the effect of real estate investment on innovation of industrial enterprises and the moderating effect of academic independent directors from the individual level of companies.

2. Empirical analysis

2.1. Model construction and sample selection

In order to study the impact of real estate investment on enterprise innovation of industrial enterprises, this paper set up the following model based on previous theories and literature:

$$RD_{it}=\beta_0+\beta_1 REI_{it-1}+\beta_2 Age_{it-1}+\beta_3 Size_{it-1}+\beta_4 Roe_{it-1}+\beta_5 Debt_{it-1}+\beta_6 Dual_{it-1}+\beta_7 TobinQ_{it-1}+\varepsilon_{it} \quad (1)$$

In formula (1), the subscript i represents the enterprise, t represents the time, RD represents the proportion of the enterprise's innovation investment in the operating income, which is used to represent the innovation level of the enterprise. REI_{it-1} represents the proportion of investment real estate in operating income of the enterprise in the previous period, and represents the intensity of real estate investment of the enterprise. Age is the existence time of the enterprise, Size is the size of the enterprise, and the value is the logarithm of the total assets of the enterprise. ROE is the return on equity; Debt is asset-liability ratio; Dual is whether the enterprise has two jobs in one; TobinQ is Tobin's q ratio; ε Denotes the error term.

The importance of talent and technology for enterprise innovation is self-evident. As a popular group in Chinese enterprises, do academic independent directors have a certain impact on enterprise innovation? What is the role of real estate investment on the impact path of enterprise innovation input? For inspection of the independent director Scholar the adjustment effect of enterprise innovation, the article will colleges and universities teaching, scientific research institutions, engaged in the research background and the association of independent directors as an independent director, academic and use academic independent directors in the proportion of independent directors (Scholar) to measure the situation of independent directors in listed companies hire academic.

$$RDit=\beta0+\beta1REIit\text{-}1+\beta2Scholarit\text{-}1+\beta3REIit\text{-}1*Scholarit\text{-}1+\beta4Ageit\text{-}1+\beta5Sizeit\text{-}1+\beta6Roeit\text{-}1+\beta7Debtit\text{-}1+\beta8Dualit\text{-}1+\beta9TobinQit\text{-}1+\varepsilon it \quad (2)$$

2.2. Data sources and descriptive statistics

According to the old industry classification of China Securities Regulatory Commission, this paper selects the data of A-share industrial listed companies from 2012 to 2021 as the research object. The financial data of the company are mainly from CSMAR database, and the data are supplemented by WIND database.

2.3. Empirical regression analysis

2.3.1. Effect test of real estate investment on enterprise innovation input

In order to study the impact of real estate investment on enterprise innovation, this paper adopts mixed regression model and fixed effect model to conduct basic regression analysis.

Table 1: The impact of real estate investment on firm innovation

VARIABLES	(1) Mixed	(1) Fixed
REI_{it-1}	0.019 * *	0.030 * * *
	(2.28)	(4.52)
L. Debt	1.739 * * *	1.860 * * *
	(4.51)	(5.33)
TobinQ	0.200 * * *	0.335 * * *
	(2.72)	(6.23)
Size	0.424 * * *	0.399 * * *
	(5.97)	(4.10)
Eco	0.085	0.012
	(0.57)	(0.13)
L. Dual	0.119	0.082
	(0.73)	(1.14)
Roe	4.220 * *	5.061 * * *
	(2.52)	(3.75)
L. Age	0.025 *	0.031 * * *
	(1.70)	(5.61)
Scholar	6.579 * * *	6.468 * * *
	(24.22)	(39.65)
REI_ Scholar	1.457 * * *	1.427 * * *
	(24.73)	(52.73)
Constant	14.905 * * *	14.368 * * *
	(8.67)	(6.73)
Observations	1778	1778
R-squared	0.358	0.369

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The benchmark regression results show that the impact of real estate investment on innovation and R&D investment of listed industrial companies is significantly negative at the level of 1% and 5%, respectively. This paper uses the fixed effects model to analyze the empirical results. As can be seen from the second column of table1, the proportion of investment real estate in business income in the last period did not increase by 1 percentage point, and the innovation input of enterprises decreased by 0.030 percentage points, indicating that the real estate investment of industrial enterprises inhibited the innovation input of enterprises. This indicates that the high profits obtained by enterprises from the real estate industry have not become the capital for their innovation and development, and most of the funds are still stuck in the real estate industry. The crowding-out effect of real estate investment on innovation input of industrial enterprises is also more significant than the mortgage effect caused by the increase of real estate investment of industrial enterprises. At the same time, the control variables in the table are also correlated with the dependent variable enterprise innovation input. The debt-to-asset ratio of the last period, the Size of the enterprise, the Roe value of the return on equity, the Age of the enterprise and Scholar are all significantly negative with the proportion of R&D investment of the enterprise at the level of 1%. The reason may be that the higher the debt level of the enterprise, the tighter the capital of the enterprise, and the less likely it is to carry out the enterprise innovation investment activities with higher risk. In addition, with the expansion of scale, enterprises become more diversified and pay more attention to

investment products with stable returns rather than innovation and R&D activities with higher risks. The higher the return on equity is, the more profit-seeking enterprises are, it is easy to invest in the real estate industry out of the profit-seeking influence, thus crowding out the innovation investment of enterprises. Enterprise age is negatively correlated with enterprise R&D investment, indicating that the longer the enterprise exists, the more solidified the production model and profit model, and the more difficult it is to actively carry out enterprise innovation activities. The ratio of academic independent directors to enterprise innovation input is negatively correlated, indicating that as expected, academic independent directors play a direct role in promoting R&D investment. The Tobin Q and R&D intensity of enterprises are significantly positive at the 1% level, which indicates that the enterprise R&D investment increases with the return on investment of enterprises.

2.3.2 Moderating effect of academic independent directors

In today's increasingly fierce competition among enterprises, the board of directors, as the decision-making body of enterprises, plays a pivotal role in the process of enterprise governance. As an important part of the board of directors, independent directors have both independence and the status of corporate directors. They can often objectively make reasonable suggestions for corporate decision-making. As an important part of independent directors, academic independent directors have taken up an increasing proportion in the number of independent directors in recent years, and their improvement has attracted people's attention. As for the influence of academic independent directors on enterprise innovation,

Some achievements have been made by scholars. Zhang Yongkui (2019) found that employing university professors as independent directors indeed has a positive impact on enterprise R&D investment, and with the increase of university professors in independent directors, enterprise innovation investment will also rise[5].Jiao Yuehua (2021) further divided academic independent directors into advantage platform and general platform, and found that academic independent directors of advantage platform can promote the increase of enterprise R&D investment[6].However, they did not study the moderating effect of academic independent directors on enterprise investment in real estate. Therefore, this paper introduces the proportion of academic independent directors among independent directors as a moderating variable to study the moderating effect of academic independent directors on enterprise R&D investment. By table 1 shows, scholarly independent director and the company the product of the net on the issue of the investment real estate in 1% level significantly positive, which suggests that academic independent directors and the regulation of the net investment in the real estate product variables are related to the intensity of enterprise R&D, scholarly independent directors to the enterprise to invest in real estate is really positive adjustment, It alleviates the crowding-out effect of real estate investment on enterprise innovation input.As the owners of knowledge and technology, academic independent directors are more likely to play their professional and technical advantages in the board of directors to promote the implementation of enterprise innovation programs. The independence of academic independent directors determines that they are not easy to be limited by short-term investment income, so they tend to hold an opposing attitude towards real estate investment.

3. Conclusion and Enlightenment

3.1. Research Conclusions

From the perspective of micro industrial enterprises, this paper uses the data of listed industrial enterprises from 2012 to 2021 to study the impact of real estate investment on innovation input of industrial enterprises and the role played by academic independent directors. The results are as

follows: First, cross-industry real estate investment by industrial enterprises has a negative impact on enterprise innovation, which squeezes out enterprise R&D investment. Secondly, academic independent directors play an inhibitory role in the investment of industrial enterprises in the real estate industry, inhibit the cross-industry real estate investment behavior of industrial enterprises, optimize the investment structure of enterprises, and promote the sustainable development of enterprises. Thirdly, enterprise size, age and other factors are negatively correlated with the intensity of innovation input of industrial enterprises.

3.2. Research Implications

Innovation is the source power of enterprise development. How to promote the development of enterprise innovation has always been a topic we continue to explore. In this paper, we believe that the real estate investment of enterprises should follow different policy supply, create a good internal control and external market environment, so as to optimize the asset allocation decision of enterprises, and provide a boost for the high-quality development of the economy. We should vigorously support small and medium-sized enterprises, which are often more innovative and easier to make creative achievements due to their smaller size, less financing channels and financial difficulties. Therefore, we should vigorously support small and medium-sized enterprises, and truly achieve mass entrepreneurship and innovation. Academic independent directors are an important part of corporate governance. Listed companies should give full play to the moderating role of academic independent directors on enterprise innovation, actively hire high-quality scholars as guides for enterprise innovation and development, and better play the role of their academic literacy in promoting enterprise R&D and innovation.

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