An Empirical Study of the Impact of Digital Finance on Corporate Investment Efficiency

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Abstract: Efficiency has become an important goal of future economic change, and it is important for enterprises to make efficient investment, which can provide impetus for the realization of enterprise strategy, the value reengineering of industrial chain, and the allocation of social resources. However, due to financing constraints and cost issues, inefficient investment behavior is still widespread, thanks to technological upgrades, consumption levels and other factors, China's digital financial development is gradually improved. In this article, we explore how digital finance affects investor performance by using data from the Digital Finance Index and SMEs. This thesis formulates a hypothesis, constructs a model, and analyzes it. We use these empirical analyses to assess the association between digital finance and investor performance, and ultimately draw our findings and give our policy recommendations. On this basis, the paper puts forward several policy recommendations: first, the government should actively promote the development of digital finance; second, it should take the initiative to carry out digital transformation to facilitate the investment of enterprises.Online operations and services should be improved; proprietary corporate and individual credit assessment models should be constructed and continuously optimized.

1. Introduction

In recent years, there has been extensive academic research on whether digital finance promotes the efficiency of business investment. The purpose of this paper is to further enrich the relevant theoretical results and provide theoretical support for enterprises to enhance investment efficiency by deeply analyzing the positive effect of digital finance on enterprise investment activities. The study of the impact of digital finance on investment efficiency not only helps to deepen our understanding of the development effect of digital finance, but also provides a reference for the transformation and upgrading of financial institutions, promotes the technological innovation of enterprises, and facilitates the development of enterprises. In this paper, we will verify the impact mechanism of digital finance on the investment efficiency of SMEs from the three channels of financial flexibility, debt financing cost and R&D investment, to provide theoretical and empirical support for SMEs to understand the role mechanism of digital finance, and help them realize sustainable development.

2. A study related to the development of digital finance in China and the investment efficiency of Chinese enterprises

2.1 Analysis of the development of digital finance in China

2.1.1 The concept of digital finance

Digital finance is a method of improving the quality of financial services by utilizing advanced digital technology, which combines traditional financial products, digital products, digital information and payments, and through which it improves the level of service provided by financial intermediaries, promotes the development of the market economy, and facilitates the innovation of business models[1].

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2.1.2 General Status of Digital Finance Development in China

Due to the rapid development of technology, digital financial services in China have gained tremendous progress, manifested in diverse applications of digitization, virtualization, and scenarios. Especially in the current epidemic situation, the boom in digital financial services can be considered unprecedented, which brings great convenience to consumers and provides an important role in the economic and capital growth of society[2]. China's digital finance sector has a long history of booming third-party payments and has gained significant traction. The promotion of high-quality economic growth and the convenience of people's lives is of great value. In addition, where the digital financial ecosystem formed by third-party payments is reliant on, the development of the roots is relatively good and the value of inclusion is relatively high.

Due to the large differences in the level of economic development among provinces in China, the digital financial environment in each province is also very different[3]. Generally speaking, the digital financial infrastructure in economically developed areas such as Beijing, Shenzhen and Shanghai is more complete and the digital financial market is more mature, while the lack of digital financial infrastructure and good digital financial development environment in less-developed areas such as Qinghai leads to the development level of digital finance lagging behind compared with that in developed areas. The lack of digital financial infrastructure in less developed regions such as Qinghai , as well as favorable conditions for the development of digital finance, has left a gap between China's digital financial development and economically developed regions[4].

2.2 Studies on the efficiency of enterprise investment

2.2.1 The concept of enterprise investment efficiency

Investment efficiency refers to a company's ability to invest in an investment project and the benefits derived from it. Investment efficiency can be assessed by comparing it to the optimal level of investment[5]. The difference is that in reality companies tend to invest inefficiently, which can affect their business value.

2.2.2 Factors affecting the efficiency of enterprise investment

Government intervention hampens corporate investment efficiency due to information asymmetry. It can only improve efficiency through refinancing to prevent over-investment. Meanwhile, SMEs benefit from government policies, especially those under strict control, which expand investments to avoid over-investment[6].

Sound markets and efficient investments go hand in hand. Market improvement spurs corporate growth, innovation, and economic health. Enhanced legal awareness and a robust rule-of-law environment reduce information asymmetry and boost corporate performance.

2.2.3 Current situation of investment efficiency of enterprises in China

This paper selected China's small and medium-sized companies listed in the market, as a specific research object, in-depth analysis of these companies in the investment efficiency of the relevant issues, the research process introduces the Richardson (2006) investment efficiency model, the data from these companies from 2011 to 2020.From the trend of change, it can be seen that there are two phenomena prevailing in China's SMEs in terms of investment, investment transformation or under-investment, and in the latter phenomenon, SMEs account for a relatively high proportion.

3. Theoretical analysis

3.1 Relevant theoretical foundations

3.1.1 Theory of financial constraints

There are two main types of corporate financing paths, one is internal financing, which is the least costly type of financing, and the other is external financing, which creates financing constraints for companies. There are a number of factors that influence financing constraints: first,

information asymmetry[7]. For the suppliers of exogenous capital, their direct access to information within the firm is more costly, all of which raises the risk for external investors, who are less willing to invest. The second is the macro-environment. When there are changes in national policies, laws or monetary policies, they can directly affect corporate finance. Third, internal corporate governance. This includes the company's level of risk management, cash flow management capability and information disclosure.

3.1.2 Theory of financing preferences

According to MM theory, equity financing may bring negative impacts, but it may reduce the efficiency of financing, and at the same time to pay higher financing costs, so the financing process should analyze the various financing methods, follow the principle of optimization of financing costs, and make a reasonable ordering of financing methods[8].

3.2 The relationship between digital finance and corporate investment efficiency

The emergence of digital finance has made a huge difference to SMEs, not only by easing their financing challenges, but also by facilitating their innovation.

This leads to the first hypothesis to be tested in this paper:

H1: Digital finance can improve the investment efficiency of firms.

4. Empirical analysis of the impact of digital finance on corporate investment efficiency

4.1 Sample Selection and Data Sources

In order to explore the impact of digital finance on the investment efficiency of enterprises in China, the digital finance index and SME data from 2011 to 2020 are selected as samples. The impact of the former on the latter is analyzed through empirical analysis. SMEs with positive corporate net worth, those with no financial operations, and those with comprehensive indicators and data were selected.

4.2 Definition of variables

4.2.1 Explained variables

In this paper, the richhardson (2006) model is introduced in the process of measuring investment efficiency, and the model is optimized in the light of the actual situation of SMEs:$Inv_{i,t}=\alpha_0+\alpha_1 Inv_{i,t-1}+\alpha_2 Size_{i,t-1}+\alpha_3 Lev_{i,t-1}+\alpha_4 Growth_{i,t-1}+\alpha_5 Age_{i,t-1}+\alpha_6 Ncfo_{i,t-1}+\alpha_7 Roe_{i,t}+\sum Year+\sum Industry+\varepsilon_{i,t}$

In this formula, Inv refers to the firm's input level, Size refers to the firm's volume, Lev refers to the firm's debt ratio, Growth refers to the firm's investment potential, Age refers to the firm's time on the market, Ncfo refers to the firm's net cash flow, Roe refers to the firm's return on net assets, and ε is the net profit margin of the firm. We can calculate the residuals, where a larger sample of residuals indicates a lack of investment, while a smaller sample indicates an over-investment.

4.2.2 Explanatory variables

This paper depicts the level of digital finance development in each province with reference to Peking University's total index of digital financial inclusion and its three sub-dimension indices, which include breadth of coverage (Digitalfin.cov), depth of use (Digitalfin.dep), and digitization degree (Digitalfin.dig). In order to calculate more accurately, we divide the real financial index by 100 as a way to reduce the bias of the indicator values and to analyze them empirically in an efficient way.

4.2.3 Control variables

Referring to the existing research results, the indexes of investment level of the enterprise (Inv), the size of the enterprise (Size), the gearing ratio of the enterprise (Lev), the TobinQ value of the enterprise (Growth), the age of the enterprise's listing (Age), the net cash flow from operating activities of the enterprise (Ncfo), and the level of the enterprise's rate of return on assets (Roa) are

selected as the control variables. This paper introduces two dummy variables Year and Industry in order to make the results more objective.

4.2.4 Model construction

To test hypothesis one, the following two empirical models are constructed:

In order to test research hypothesis 1, this paper constructs the following two empirical models:

"Age, Year, Industry, Province, and Growth, all added together, are equal to α_0, α_1, α_2, α_3, α_4, α_5, α_6, α_7 and α_8, respectively."

"$DigitalFin_{j,t}+\alpha_0+\alpha_1 Growth_{i,t}+\alpha_3 Lev_{i,t}+\alpha_4 Ncfo_{i,t}+\alpha_5 Inv_{i,t}+\alpha_6 Size_{i,t}+\alpha_7 Roa_{i,t}+\alpha_8$Age,Year,Industry, and Province $+\varepsilon_{i,t}$"

By using two real-world simulations, we can test our hypothesis 1. Important elements of the first approach include DigitalFinj, which has a value α1 representing the lack of investment in digital finance for SMEs. We conclude that α1 values will be significantly negative. An important reference point for the second model is DigitalFinj whose α1 value reflects how digital finance inhibits investment in SMEs, and based on our findings that α1 value may be negative.

4.3 Descriptive statistical analysis

There are problems with the investment efficiency of SME-listed companies, which are generally underinvested and overinvested is not significant. The maximum value of overinvestment is 1.545 and the mean value is 0.0661, which indicates that SMEs also suffer from overinvestment. According to the analysis of the above data, there are still many problems in the investment of SME listed companies, and all this phenomenon affects the investment efficiency of such companies. Effective countermeasures are necessary for the effective development of such enterprises.

4.4 Analysis of the impact of digital finance on investment efficiency

In order to improve the investment efficiency of small and medium-sized enterprises (SMEs), we chose a large number of SMEs as a research sample and selected the relevant data from 2011 to 2020 to analyze this issue. After obtaining these data, we established a multivariate linear regression model and conducted an empirical study on the above issue.

The coefficient of digital finance is significant at 1% level of significance, indicating that it promotes investment in SMEs and it enhances the investment efficiency of the firms

5. Conclusions and recommendations of the study

Digital finance can be associated with improving the efficiency of business investment. Reduce investment costs, stabilize financial risks, optimize investment decisions, accurately match supply and demand, and promote enterprise investment efficiency.Existing digital investment and financing platforms still suffer from high operating costs and business pressures. The government can reduce the pressure of platform operation through policies such as subsidies and tax reductions, and it can also lead state-owned enterprises to cooperate with the relevant platforms to expand their business volume for the platforms. Guide digital finance to small and medium-sized, non-state, science-based enterprises. Such enterprises usually face greater external financial constraints and their investment and financing needs are not adequately met. Governments should set up digitalized financial service systems for different types of SMEs. It was more difficult for financial institutions to assess the creditworthiness of business loans and investments, and the cost of business loans was higher. In the future, financial institutions should actively carry out digital transformation, optimize and improve the lending process, bring good lending services to enterprises, and help improve the efficiency of corporate investment. Specific measures are as follows: improve online business and service level; build exclusive enterprise and individual credit assessment models and optimize them continuously. Agencies can establish a tiered list system to customize exclusive credit assessment models for different classes of individual and business customers. Not only can it increase the accuracy of credit assessment, but also improve its own service level; it vigorously develops inclusive finance through online platforms.

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