

Analysis of the Situation of Corporate Financial Behaviors in the Context of Digital Economy - Based on Chinese Non-financial A-share Listed Companies

Shan Huang *

School of Economics and Management, North China Electric Power University, Beijing100000, China

* Corresponding Author Email: 120211150307@ncepu.edu.cn

Abstract. The digital economy is rapidly advancing, penetrating enterprises and influencing their behavior. To investigate how digital finance affects the financial investment decisions of enterprises, based on the panel data of Chinese A-share listed companies between 2011 and 2020, this paper uses a robust two-way fixed-effects econometric model to explore the impact of digital finance on corporate financialization and the heterogeneity of the impact within corporates of different natures and sizes. The findings reveal that digital finance significantly inhibits corporate financialization, with a more pronounced effect observed in nationalized and large-scale enterprises. Therefore, it is imperative for the government to enhance supervision and management of enterprises, as well as encourage and guide them to strengthen their digital finance capabilities to fully harness its potential.

Keywords: Corporate Financial Behaviors, digital economy, corporates of different natures and sizes.

1. Introduction

The problem of virtualization realization is a major obstacle to the current development of the Chinese economy. The virtual economy is growing quickly at a macro level. In the financial sector, there is a trend toward resource allocation, which results in a sizable amount of idle money. At the micro level, businesses are increasing their allocation of financial assets and escalating financialization, which is defined as firms' increased investment in financial assets relative to actual business operations. According to CSMA statistics, the ratio of financial assets to fixed assets owned by China's non-financial firms increased from 15.28% in 2011 to 31.43% in 2018, more than tripling in only seven years. According to the Wind database, as of 2020, a total of 79% of A-share enterprises possessed financial assets, with 5% of them holding financial assets accounting for over 10% of their total assets.

In recent years, digital finance has experienced rapid growth, as evidenced by data from the Digital Finance Research Center of Peking University (as shown in Figure 1). The financial system is just one of the many industries that have been included in China's expansion of digital financial inclusion. In addition to allowing financial institutions to access information more accurately and comprehensively, improving the effectiveness of capital allocation, advanced technological tools like the internet and cloud computing have also made a variety of lending and financing channels available. The quick pace of growth in digital finance has, however, also given rise to some difficulties that could endanger the implementation of an enterprise. These challenges may impact the precautionary savings behavior of enterprises, leading them to pursue higher profits and invest a significant amount of funds through digital financial means into financial products, and the increased circulation of capital may pose difficulties in regulation. Consequently, it is of utmost practical significance to investigate the influence of digital finance development on corporate financial behaviors.

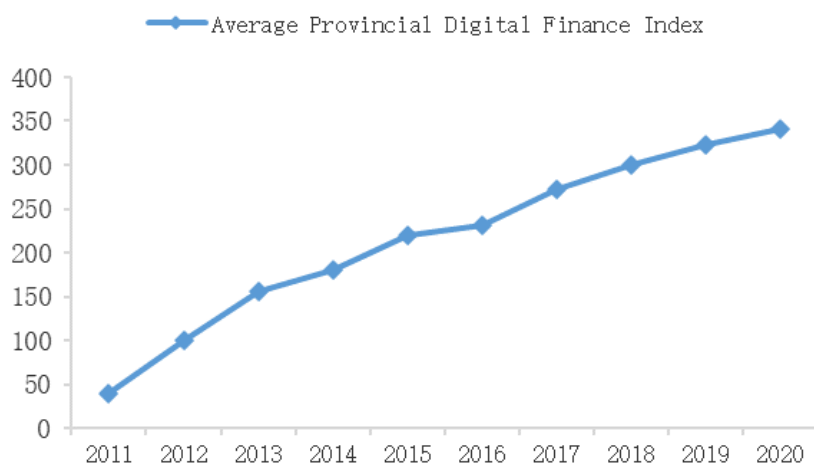


Figure 1. Digital finance development trend in China

Marginal contribution of this paper: This paper makes a valuable contribution by examining the mechanism of digital finance from an enterprise perspective. It explores the different heterogeneous effects of digital finance on corporate financial behaviors, which has significant practical implications and can provide better solutions to real-world problems.

The paper is structured as follows: Section 1 is introduction, which provides an overview of the research background, digital finance and corporate financial behaviors' situation. Section 2 is Literature Review. In this section, a comprehensive review of existing research on the relationship between digital finance and corporate financial behaviors has been discussed. Section 3 is Study Design. This section outlines the design of the study, including the selection of variables and the model. And section 4 describes the empirical results. It further explores the heterogeneity of this relationship in different types of corporations and varying sizes. Section 5 is about Research Conclusions, which summarizes the findings of the paper and offers relevant suggestions based on these conclusions.

2. Literature Review

2.1. Digital Finance and the corporate financial behaviors

Scholars' opinions on the correlation between digital finance and corporate financial behaviors are inconsistent. Some studies suggest that digital finance actually promotes the financialization of enterprises. They argue that Internet finance facilitates enterprises in obtaining capital for financialized investments, resulting in a phenomenon known as "de-realization to virtualization". Supporting this notion, Yang and Shen (2020) discovered that digital finance eases the financing constraints faced by firms. Consequently, lower-growth firms are inclined to invest in higher-yielding financial assets for speculative purposes [1]. On the contrary, several studies have demonstrated that digital finance actually inhibits the financialization of firms. These studies argue that financial technology in digital finance enables the tracking of credit fund usage, exerting a supervisory role that weakens incentives for investing into financial products. Xin (2021) also found that digital finance leads to a decrease in the rate of return on firms' investments in financial assets, as well as a reduction in financial management costs. Ultimately, this promotes real investment in firms while curbing financialization tendencies [2].

2.2. Factors influencing the corporate financial behaviors

The present literature on the factors influencing the corporate financial behaviors concentrates on two aspects: macro environmental external factors and micro internal enterprise characteristics.

From a macro perspective, the level of economic and financial development plays a significant role in the corporate financial behaviors. During an economic downturn, when the financial market is growing rapidly, enterprises tend to invest more funds in financial products to pursue profits and

mitigate real business risks [3] (Orhan Gazi, 2008). Uncertainty of economic policy encourages enterprises to seek multiple investment channels, thereby promoting financialization [4] (Bakersr et al., 2016). Conversely, industrial policy can reduce enterprises' motivation to alleviate financial constraints and operational risks, leading to decreased financialization [5] (Cao et al., 2021). A rise in financial market risk stimulates enterprises to engage in speculative asset allocation, further deepening their financialization [6] (Chen et al., 2021). Additionally, an imperfect credit fund market exacerbates enterprises' financing difficulties, contributing to their "de-realization"[7] (Yu, 2017).

From a micro perspective, enterprises with multiple major shareholders might tend to have a lower degree of financialization compared to those with only one shareholder [8] (Jiang et al., 2022). When an enterprise has institutional investors holding shares, its investment portfolio tends to be more diversified, resulting in a higher degree of financialization [9] (Alexiou et al., 2021). For enterprises facing financing constraints, they prefer financial assets that increase the credit resources, thereby increasing their degree of financialization [10] (Zhou et al., 2022). In terms of enterprise strategy, enterprises may exhibit a precautionary motive, leading them to invest idle funds in financial products in order to pursue higher profits and address issues of liquidity [11] (Du et al., 2017). It has also been found that enterprise financing significantly promotes financialization, while securities financing has the opposite effect [12] (Du & Deng, 2020). Additionally, Wang and Huang (2020) suggest that a higher quality of internal control within an enterprise is associated with a lower degree of financialization [13].

In conclusion, the current academic research on the connection between corporate financial behaviors and digital finance has produced a variety of viewpoints and ambiguous results. By presenting more empirical evidence on this link using data from Chinese non-financial A-share listed companies, this study seeks to add to the body of existing work. The macroeconomic development, economic policy, financial market risk, as well as microeconomic factors like the number of shareholders, financial constraints, and corporate strategy are all currently being studied by academics as determinants of corporate financial asset allocation. Based on these elements, this study investigates the connection between corporate financial behaviors and digital finance in various scenarios. Additionally, this study investigates how differently digital finance affects corporate financial behaviors in distinct circumstances.

3. Study Design

3.1. Variable Design

3.1.1. Explained variables

This study aims to investigate the effects of digital finance on corporate financial behaviors, so corporate financialization is defined as the explanatory variable in this research. To measure corporate financialization, the proportion of financial investment assets to total assets is utilized. Due to missing data and other circumstances, the measurement is refined by considering the ratio of the sum of trading financial assets, available-for-sale financial assets, and net investment properties to total assets. To ensure data accuracy, this study adopts the quarterly average ratio of financial assets to total assets, representing the average for the current year.

3.1.2. Explanatory Variables

In this study, we focus on digital finance as the explanatory variable in our measurement model. The data for this variable is sourced from the Digital Finance Inclusive Finance Index, a publication by the esteemed Digital Finance Research Center at Peking University. This research makes use of the province digital finance development index, which offers a solid framework for assessing the influence of digital finance on multiple dimensions, to enable thorough analysis.

3.1.3. Control Variables

To mitigate potential biases when examining the influence of digital finance on enterprise financialization, this study carefully selects a set of variables that are known to impact the financialization process. A total of seven control variables are chosen: enterprise age, capital intensity, enterprise growth, enterprise size, equity concentration, relative value, and profitability. Drawing from the research of Wu and Yi (2021), it is evident that equity concentration significantly inhibits the financialization of non-financial enterprises [14]. Therefore, this paper incorporates equity concentration as a control variable, represented by the proportion of shares held by the largest shareholder. Additionally, Zhang (2019) suggests that the decline in the return rate of the real economy directly contributes to enterprise financialization [15]. Hence, this study includes enterprise profitability as a control variable, measured by the return on investment. Furthermore, Zhang and Zhu Ge (2013) indicate that capital-intensive, high-value chain industries exhibit a relatively high proportion of financial investment [16]. As a result, this paper incorporates capital intensity as a control variable. Moreover, considering the impact of firm age, firm growth, firm scale, and relative value on financialization [17] [18] (Zhang and Zheng, 2020; Zhai and Wang, 2023), this study includes them as control variables, represented by the years of establishment, the growth rate of business revenue, total assets, and Tobin's Q value, respectively.

Variables, symbols and specific definition are shown in Table 1.

3.2. Model

In this study, a robust two-way fixed-effects econometric model is constructed to conduct regression analysis. This is a powerful analytical tool that leverages panel data to examine the interactive effects between multiple levels. It offers distinct advantages as it incorporates both individual fixed effects and time fixed effects, effectively controlling for within-individual and temporal variations, thus enhancing the accuracy and reliability of analyzing interaction effects. Given the extensive time span of 2011-2020 and the significant number of firms included in this paper's panel data analysis, there are inherent challenges related to time differences and individual variations that may impact the accuracy of the results. To control the potential biases and ensure more precise analysis, this study employs a robust two-way fixed effects model. Specifically, the model is represented by equation (1):

$$Fini, t = c + \alpha Dif_{i, t} + \beta \Sigma Coni, t + \mu_i + \delta t + \epsilon_{i, t} \quad (1)$$

Table 1. Variable definition table

	Variable Name	Variable Sign	Variable Explanation
Explained variables	Corporate financialization	Fin	(trading financial assets + available-for-sale financial assets + net investment properties)/ total assets
Explanatory Variables	Digital financial	Dif	Match digital Finance index by listing address of listed company
Control Variables	firm age	Age	Years of establishment
	capital intensity	Capital	total assets/revenue
	firm growth	Growrat	The growth rate of business revenue
	firm scale	Size	Total assets at the end of the year are taken as the natural logarithm
	equity concentration	Top1	Multiply the proportion of shares held by the largest shareholder by 100 and take the natural logarithm
	relative value	Tbq	Tobin's Q value
	enterprise profitability	Roi	the return on investment

Where i denotes an individual firm and t denotes the year. Fin is the explanatory variable financialization of the firm, characterized by the share of three types of financial assets in total assets. Dif is the explanatory variable numerical finance, and Con is the group of control variables, including shareholding concentration, etc. α represents the elasticity coefficient of the explanatory variable numerical finance, which denotes that the explanatory variable changes by α units when the explanatory variable changes by one unit. β represents the elasticity coefficient of the group of control variables, indicating that the explanatory variables change by β units when the control variable group changes by one unit. In addition, Individual fixed effects are portrayed using μ_i , time fixed effects are represented using δ_t , and random interference terms are characterized using ε_{it} .

3.3. Data sources

The balanced panel data for this study is sourced from Chinese A-share listed companies spanning the period from 2011 to 2020. The digital finance index, a chosen indicator of digital finance, is derived from the Digital Finance Inclusive Finance Index compiled by the Digital Finance Research Center at Peking University. The study commences from 2011, as the digital finance index has been publicly available since that year. Financialization data, as well as control variables such as balance sheet ratios, are obtained from the CSMAR database and enterprise annual reports.

3.4. Descriptive Statistics

The descriptive statistics of each variable is as shown in Table 2.

Table 2. Descriptive statistical analysis

Variable	Obs.	Mean	Std. dev.	Min	Max
Fin	1000	0.1010	0.1316	0.0000	0.7794
Dif	1000	270.6608	105.4134	69.4800	431.9300
Age	1000	16.6550	6.5176	1.0000	31.0000
Capital	1000	4.6419	40.3890	0.1563	915.4745
Growrat	1000	0.1600	0.7458	-0.7062	17.5263
Size	1000	23.5502	1.7005	19.9727	28.4012
Top1	1000	3.2688	0.8585	-0.6070	4.4454
Tbq	1000	1.7444	1.7124	0.7641	31.4002
Roi	1000	0.4753	3.4439	-2.7565	65.3684

4. Results

4.1. Benchmark regression and tests for stability

In this paper, a two-way fixed effects model was used and a two-way fixed effects regression was done with the following results (as shown in Table 3). The coefficient of the Digital Finance variable (Dif) is reported as -0.00080467, significant at the 10% level. This suggests that a higher level of digital finance development is associated with a weaker tendency towards firm financialization.

Table 3. Baseline regression and robustness analysis result

	Fin	1%Fin	5%Fin	10%Fin
Dif	-0.0008* (-1.87)	-0.0007* (-1.82)	-0.0005* (-1.66)	-0.0006** (-2.33)
Age	-0.0299*** (-3.28)	-0.0209** (-2.54)	-0.0012 (-0.35)	-0.0006 (-0.31)
Capital	0.0002** (2.34)	0.0041*** (3.29)	0.0133*** (3.14)	0.0205*** (4.48)
Growrat	0.0143*** (4.13)	0.0208*** (2.70)	0.0174* (1.67)	0.0172 (1.58)
Size	-0.0168** (-2.32)	-0.0222*** (-3.05)	-0.0193*** (-3.12)	-0.0143*** (-2.60)
Top1	-0.0055* (-1.70)	-0.0049 (-1.53)	-0.0044 (-1.36)	-0.0047 (-1.28)
Tbq	-0.0012 (-0.61)	-0.0015 (-0.43)	-0.0024 (-0.48)	0.0006 (0.10)
Roi	-0.0031*** (-3.95)	-0.0084*** (-2.84)	-0.0313*** (-3.35)	-0.0493*** (-4.18)

* Denotes P-value. When $P > 0.1$, it is not labeled; if $0.1 > P > 0.05$, it is labeled as *; if $0.05 > P > 0.01$, it is labeled as **; if $P < 0.01$, it is labeled as ***. Clustering robust standard error in parentheses. The following tables are the same.

This phenomenon may be attributed to the tendency of enterprises facing financing difficulties to prioritize the allocation of financial assets that can enhance credit resources. However, the emergence of digital finance has expanded the range of external financing options available to enterprises, facilitating diversified financing. Consequently, this has led to an increased allocation of industrial assets, resulting in a crowding-out effect on the allocation of financial assets and a decrease in the proportion of financialized assets. Simultaneously, the advancement of digital finance has enabled financing parties to address information asymmetry and other challenges through cutting-edge technological means. As a result, the financing costs for real enterprises have been reduced. This, in turn, intensifies the competition for the allocation of real assets and leads to a decline in the allocation ratio of financial assets.

The paper also performs a robustness analysis by truncating the data and the results are shown in the last three columns of Table 1. The coefficient on Dif is -0.0007356 when the data is truncated at 1% and is significant at the 10% level. The coefficient on Dif is -0.0004577 when truncated at 5% and is also significant at the 10% level. The coefficient of Dif is -0.0005711 when 10% truncation is performed, which is significant at the 5% level. This indicates that the results are robust.

4.2. Tests for heterogeneity

4.2.1. Nature of the enterprise

Table 4 analyzes the effect of digital finance on financialization of firms in state-owned enterprises (SOEs) and non-state-owned enterprises (non-SOEs). In SOEs, the coefficient of the interaction term between Dif and corporate financialization (Fin) is estimated as -0.0016012, significant at the 1% level. This suggests that the development of digital finance significantly inhibits corporate financialization in SOEs. On the other hand, in non-state-owned firms, the coefficient of Dif is estimated as 0.0013676, but it is found to be insignificant. This indicates that corporate financialization.

Table 4. Regression analysis of differences in nature of enterprise.

	SOEs Fin	non-SOEs Fin
Dif	-0.0016*** (-3.50)	0.0014 (1.52)
Age	-0.0230*** (-2.87)	-0.0715*** (-3.09)
Capital	0.0028*** (3.07)	0.0001 (0.97)
Growrat	0.0126*** (2.81)	0.0118* (1.94)
Size	-0.0401*** (-5.95)	0.0178 (1.08)
Top1	-0.0056* (-1.86)	-0.0014 (-0.20)
Tbq	-0.0023 (-0.72)	-0.0021 (-0.70)
Roa	-0.0025** (-2.38)	-0.0032** (-2.36)

This phenomenon can be attributed to several factors. Firstly, SOEs often have government functions and a weaker profit motive compared to non-SOEs. Additionally, they face stronger government regulation due to the need to preserve and increase the value of state-owned assets. In the current context of China's economy, which has seen a shift towards virtualization, the financialization of SOEs is being strictly controlled.

As a result, the development of digital finance, which promotes financing, leads to a policy-driven redirection of funds from SOEs towards the real sector. This "de-realization to real" approach significantly impacts the financialization of state-owned enterprises. On the other hand, non-state-owned enterprises, which have a stronger profit motive and relatively weaker government regulation, benefit from the convenience of financing brought about by digital finance. This further promotes the allocation of financial assets while supporting real investment. Consequently, the impact of digital finance on the financialization of non-state-owned enterprises is not significant.

4.2.2. Size of the enterprise

Table 5 shows the effect of digital finance on financialization of firms in firms of different sizes. The table reveals that the interaction between digital finance (Dif) and the financialization of firms (Fin) in large-scale firms is characterized by a significant coefficient of -0.001283 at the 1% level. This finding implies that the advancement of digital finance significantly hampers corporate financialization within large-scale firms. Conversely, in small-scale firms, the coefficient for Digital Finance (Dif) is 0.0003052, which lacks significance. This suggests that the progress of digital finance in small-scale firms may potentially foster corporate financialization.

Table 5. Regression analysis of differences in size of the enterprise

	large-scale Fin	small-scale Fin
Dif	-0.0013*** (-2.97)	0.0003 (0.31)
Age	-0.0237*** (-2.87)	-0.0385 (-1.65)
Capital	0.0002*** (3.14)	0.0014 (0.22)
Growrat	0.0167*** (5.39)	0.0094 (0.43)
Size	-0.0018 (-0.27)	-0.0232 (-0.82)
Top1	-0.0010 (-0.36)	-0.0139 (-1.57)
Tbq	-0.0037 (-1.19)	-0.0233 (-0.72)
Roa	-0.0044*** (-4.86)	-0.0027* (-1.88)

This is because large-scale firms, with their abundance of capital, assets, and objective operating income, face relatively lower risks and therefore have less incentive to take precautionary measures. As a result, funds obtained through digital financial techniques are predominantly allocated to industrial assets in order to sustain industry growth, leading to a crowding-out effect on financial assets. Consequently, the development of digital finance has a more pronounced dampening effect on the financialization of large-scale firms. In contrast, small-scale enterprises face greater risks and have a stronger incentive to take preventive measures due to their limited assets and resources. While the development of digital finance improves the funding mismatch and facilitates easier access to funds for small and medium-sized enterprises (SMEs), these enterprises continue to invest their funds in financial assets that offer higher profitability and liquidity. Therefore, among small-scale firms, the impact of digital finance on financialization is not significant.

5. Conclusion

This paper examines the correlation between digital finance and the financialization of enterprises, and explores the heterogeneity in different types of corporations and varying sizes, uses robust two-way fixed-effects econometric model with data from 2011 to 2020. The following conclusions can be drawn: First, the growth of digital finance can significantly curb the financialization of enterprises and promote the transformation of enterprises from virtual too real by reducing the level of financing constraint. and the results are robust when the data is truncated at 1%, 5% and 10% separately. Second, the disincentive effect of digital finance in SOEs is stronger than non-SOEs, because of the stronger regulatory nature of SOEs and the profit-seeking nature of non-SOEs. Thirdly, the dampening effect of digital finance on corporate financialization is more pronounced among large-scale firms than small-scale firms, due to the higher riskiness and preventive motives in small-scale firms.

The policy recommendations of this paper are as follows. Firstly, the development of digital finance has a significant impact on curbing the financialization of enterprises. Consequently, it is recommended that the government encourage and guide enterprises to adopt digital economy technologies and related equipment. Furthermore, efforts should be made to continue enhancing the construction of the digital financial system to facilitate the positive impact of digital finance. Secondly, according to the study of heterogeneity, it is observed that inadequate supervision and profit-driven behavior of enterprises weaken the inhibitory effect of digital finance on this transformation. Therefore, it is essential for the government to strengthen the supervision of enterprises, improve the

market system, and mitigate corresponding risks. By enhancing the sense of security among enterprises and reducing their preventive motives, the full potential of digital finance can be realized.

References

- [1] L. Yang, Z. H. Shen, Financing constraints, bank lending and corporate financialization[J]. Finance and Accounting Newsletter, 23, 60 - 64 (2020).
- [2] D. L. Xin, Fintech and Corporate "Degrowth"--- Evidence from China's A-share Listed Companies[J]. Contemporary Finance and Economics, 7, 65 - 76 (2021).
- [3] O. Orhangazi, Financialization and capital accumulation in the non-financial corporate sector: A theoretical and empirical investigation on the US economy [J]. Cambridge Journal of Economics, 32 (6), 863 - 886 (2008).
- [4] S. R. Baker, N. Bloomn, S.J. Davis, Measuring economic policy uncertainty [J]. The Quarterly Journal of Economics, 131 (4), 1593 - 1636 (2016).
- [5] W. Cao, C. Chen, D. Jiang, et al. Industrial policy and non-financial corporations' financialization: evidence from China [J]. European Journal of Finance, 12, 1 - 19 (2021).
- [6] X. M. Chen, W. Huang, Y. Sun, Financial market risk, corporate financialization and corporate fixed asset investment efficiency [J]. Business Research, 3, 65 - 72 (2021).
- [7] Q. P. Yu, The governance of "deconcentration" in the perspective of balanced economic development [J]. Reform, 4, 70 - 79 (2017).
- [8] F. Jiang, Y. Shen, X. Cai, Can Multiple Blockholders Restrain Corporate Financialization? Pacific-Basin Finance Journal, 75, 101827 (2022).
- [9] C. Alexiou, A. Mohamed, J. Nellis, The impact of institutional investors on firms' performance in the context of financialization [J]. International Journal of Finance & Economics, 26 (2021).
- [10] H. Zhou, C.S. Zhang, H.Q. Tang, Financing constraints and financialization of real enterprises [J]. Journal of Management Science, 23 (12), 91 - 109 (2020).
- [11] Y. Du, H. Zhang, J.Y. Chen, The impact of financialization on the future main business development of real enterprises: promotion or inhibition [J]. China Industrial Economy, 12, 113 - 131 (2017).
- [12] Y. Du, X. Deng, Chinese-style financing and financialization of enterprises - a quasi-natural experiment based on batch expansion [J]. Finance and Trade Economics, 2, 69 - 83 (2020).
- [13] Y. Wang, X.H. Huang, Internal control and financialization of real enterprises: governance effect or boosting effect [J]. Financial Science, 2, 26 - 38 (2020).
- [14] Y. D. Wu, Z.W. Yi, Equity concentration and financialization of non-financial firms: the role of agency costs [J]. Industrial Technology and Economics, 40 (09), 91 - 97 (2021).
- [15] C. S. Zhang, The logic and reflection of financialization [J]. Economic Research, 54 (11), 4 - 20 (2019).
- [16] M. B. Zhang, H. Z. Zhu Ge, Financialization of the Chinese economy in the context of globalization: Meaning and empirical tests [J]. World Economic and Political Forum, 1, 122-138 (2013).
- [17] C. S. Zhang, N. Zheng, Financialization of Chinese Real Enterprises: Monetary Expansion, Capital Profit-seeking or Risk Avoidance? [J]. Financial Research, 9, 1 - 19 (2020).
- [18] J. Zhai, S.H. Wang, Fintech, Monetary Policy and Corporate "De-virtualization to Reality"[J]. Dongyue Lecture Series, 44 (03), 159 - 173 (2023).