

Research on the Mechanism and Path of Fintech Empowering the Degree of Enterprise Financialization—Based on the Mediating Role of Resource Allocation Efficiency

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Abstract. We use data from the financial industry from 2008 to 2022. By constructing a benchmark regression model and a mediated effect model, it empirically examines the influence of fintech on the degree of enterprise financialization and thoroughly analyzes the mediating effect of resource allocation efficiency in this process. The results illustrate that fintech has a significant positive influence on the degree of enterprise financialization, and resource allocation efficiency plays a partial mediating role. Moreover, the impact of fintech on the degree of enterprise financialization is more significant in non-nation-owned enterprises and small-scale enterprises.

Keywords: Financial technology, Degree of enterprise financialization, Resource allocation efficiency.

1. Introduction

With the acceleration of global digital transformation, fintech has become an important driver of the degree of enterprise financialization. In recent years, relevant policies have emphasized the need to develop the integration of the digital economy and the real economy. The degree of enterprise financialization is crucial for building a powerful financial country and a modern socialist powerful country.

Currently, there are still problems such as uneven resource allocation and low efficiency in the degree of enterprise financialization. For example, financial resources are overly concentrated in large enterprises and projects, small and micro enterprises and remote areas receive insufficient financial services, and traditional financial institutions have issues such as information asymmetry and low decision-making efficiency when allocating resources, which further exacerbates the imbalance in resource allocation. As an innovative force integrating finance and technology, fintech provides support for the digital transform of the financial industry, it also can fully utilize its advantages in enhancing efficiency, reducing costs, and strengthening risk control to promote the degree of enterprise financialization.

Some scholars have found that in the digital economy era, the internal mechanism by which fintech promotes the development of the financial industry is that fintech uses advanced technologies to change the financial service model, improve service efficiency, and expand the service scope, having an important impact on business innovation, risk management, and customer expansion of financial institutions [1]. Furthermore, Professor Li Quan et al. (2024) focused on studying how the sci-tech financial system provides various factor supports for new growth drivers, emphasizing that the sci-tech financial system plays an important role in fund-raising, resource allocation, risk sharing, etc., promoting the in-depth integration of scientific and technological innovation and finance, and providing key elements such as funds, technologies, and talents for the development of new growth drivers [2]. Finally, in terms of focusing on the ways and means by which fintech empowers the degree of enterprise financialization, Professor Sato Yasuhiro believes that fintech can improve the allocation efficiency of financial resources, optimize the financial structure, innovate financial products and services, and strengthen risk management through technologies such as big data and artificial intelligence to increase the degree of enterprise financialization [3].

Based on this, this paper focuses on the degree of enterprise financialization, measures the influence of fintech on the degree of financialization of listed companies in China, and explores the

impact mechanism from the perspective of factor marketization. The contributions of this paper are as follows: it conducts an in-depth analysis of the impact of fintech on the degree of enterprise financialization, details the impact path, and emphasizes the mediating role of resource allocation efficiency, offering new theoretical support for understanding the relationship between fintech and the degree of enterprise financialization.

2. Theoretical Mechanism and Research Hypotheses

2.1. Fintech and the Degree of Enterprise Financialization

The rise uses with fintech has brought new development chances to the financial industry. Fintech reshapes the financial service model through advanced technologies such as artificial intelligence, guiding funds to flow more precisely to high-quality projects and promising enterprises, providing a powerful driving force for the innovative development of the financial industry. Fintech utilizes data mining and analysis technologies to strengthen the accuracy and efficiency of financial services. For example, by analyzing customers' risk preferences and needs through big data, financial institutions can provide personalized financial products and services to improve customer satisfaction [4]. The application of technologies such as robo-advisors can realize the automated management of assets, reduce investment costs, and increase investment returns. Fintech effectively alleviates the information asymmetry problem in the financial industry and reduces transaction risks. The immutability and traceability of blockchain technology ensure the authenticity and security of transaction data, reducing the occurrence of fraudulent behaviors [5]. Fintech also expands the width and depth of financial services by promoting financial product innovation. For example, by using artificial intelligence and big data technologies, financial institutions can develop innovative financial products to meet the diverse needs of different customers [6]. Meanwhile, the popularization of mobile payment and other technologies has changed people's payment methods and improved the convenience of financial services. Fintech reduces operating costs by improving the operating efficiency of financial institutions [12]. The use of technologies such as cloud computing can realize the information management of financial institutions, improve data processing and storage capabilities, and reduce human and material costs. From this, we propose Hypothesis 1: Hypothesis 1: Fintech can significantly promote the degree of enterprise financialization.

2.2. The Mediating Role of Resource Allocation Efficiency

Resource allocation efficiency is a significant driving force for high-quality economic development and plays a crucial mediating part in the relationship between fintech and the degree of enterprise financialization.

On the one hand, fintech promotes the progress of resource allocation efficiency. Fintech utilizes advanced technologies such as big data and AI to enhance the information transparency of the factor market and resource allocation efficiency. For example, through big data analysis, it is possible to evaluate the value and risk of factors more accurately, providing a basis for the reasonable pricing of factors [7]. Meanwhile, the application of blockchain technology can ensure the authenticity and security of factor transactions, reduce transaction costs, and improve transaction efficiency [8]. Fintech also facilitates the cross-regional flow of factors, breaking geographical limitations and enabling factors to be optimally allocated on a larger scale.

On the other hand, resource allocation efficiency contributes to the high-level development of the financial industry. Resource allocation enables resources to flow more efficiently to enterprises and projects with innovative capabilities and development potential [9]. For example, in the context of the marketization of labor factors, financial institutions and the banking industry can better provide financial support to high-end talents and innovative teams, promoting scientific and technological innovation and industrial upgrading. In the process of the marketization of land factors, financial institutions can provide financing services for the rational development and utilization of land resources, promoting urban construction and economic development. The marketization of capital

factors further broadens the sources of funds and investment channels of financial institutions, enhancing the vitality and competitiveness of the financial market [10].

From this, we put forward Hypothesis 2 and Hypothesis 3:

Hypothesis 2: Fintech can significantly improve the level of resource allocation efficiency.

Hypothesis 3: Resource allocation efficiency plays a partial mediating role between fintech and the degree of enterprise financialization.

3. Research Design

3.1. Model Construction

3.1.1. Benchmark Regression Model

Based on the research in literatures such as "Research on the Measurement of the High-Quality Development Level of China's Financial Industry and Temporal and Spatial Distribution Characteristics", in order that test the impact of fintech on the degree of enterprise financialization, the following benchmark regression model is constructed:

$$FCP_{it} = \alpha_0 + \alpha_1 FinTech_{it} + \sum_{j=2}^n \alpha_n Control_{it} + u_i + \lambda_t + \varepsilon_{it} \quad (1)$$

Where i means the individual of listed companies in the financial industry, and t represents the time; FCP is the explained variable, representing the degree of enterprise financialization; FinTech is the core explanatory variable, representing the level of fintech; Control is a set of control variables, including company size (SIZE), asset-liability ratio (DEBT), profitability (ROA), growth potential (GA), etc.; α_0 is the intercept term, and $\alpha_1, \alpha_2, \dots, \alpha_n$ are the regression coefficients; u_i represents the individual fixed effect, and λ_t represents the time fixed effect; ε_{it} is the random error term.

3.1.2. Mediating Effect Model

Referring to the mediating effect testing methods proposed by Wen Zhonglin and Ye Baojuan [14], on the basis of Model 1, Model 2 and Model 3 are further constructed:

$$CAE_{it} = \alpha_0 + \alpha_1 FinTech_{it} + \sum_{j=2}^n \alpha_n Control_{it} + u_i + \lambda_t + \varepsilon_{it} \quad (2)$$

$$FCP_{it} = \alpha_0 + \alpha_1 FinTech_{it} + \alpha_2 CAE_{it} + \sum_{j=3}^n \alpha_n Control_{it} + u_i + \lambda_t + \varepsilon_{it} \quad (3)$$

Among them, CAE represents resource allocation efficiency and serves as the mediating variable, while the other symbols remain the same. The model takes into account the mediating variable of resource allocation efficiency and its impact on the degree of enterprise financialization.

3.2. Variable Selection and Explanation

3.2.1. Explained Variable: Degree of Enterprise Financialization (FCP)

The degree of enterprise financialization is selected to measure the extent and tendency of enterprises' participation in the financial field [11].

3.2.2. Explanatory Variable: Fintech (FinTech)

This paper extracts the frequency of fintech keywords covering six dimensions such as online operation, and mobilization from the annual reports of various commercial banks by means of machine learning. Then, logarithmic processing is carried out on the obtained results to further derive the development level of fintech of each commercial bank in each year [12].

3.2.3. Mediating Variable: Resource Allocation Efficiency (CAE)

This paper bases on Richardson's (2006) measurement method and uses the absolute value of the residual of the model calculation to measure (CAE) [14].

3.2.4. Control Variables

Control variables in this paper: Board Size (BSIZE): the total number of the board of directors. enterprise size (SIZE), enterprise age (Age), enterprise growth ability (GA), enterprise asset-liability ratio (Debt), board independence (Indep), shareholding proportion of the largest shareholder (Top1), financing constraints (Cashflow), and board size (BSIZE)[13-15].

3.3. Data Sources

The data required for this paper are mainly sourced from the data of listed companies in the financial industry in CSMAR database from 2008 to 2022. The following steps were taken during the data processing: First, the raw data obtained from CSMAR were carefully screened and sorted. Second, the samples with incomplete data, obvious errors, and those not meeting the research requirements were removed. Third, for continuous variables, a two-sided 1% level winsorization treatment was carried out. Finally, 371 samples of 42 listed financial enterprises were obtained.

4. Empirical Analysis

4.1. Analysis of Benchmark Regression Results

The coefficient of Fintech in Model (1) is 0.007, which is significant at the 10% level. This indicates that Fintech has a positive impact on the explained variable, the degree of enterprise financialization (FCP), preliminarily verifying the establishment of Hypothesis 1. After adding the control variables, the coefficient of Fintech in Model (1) is 0.010, which is significant at the 5% level. This shows that the positive impact of Fintech on the explained variable, the degree of enterprise financialization (FCP), is even more significant, further verifying the establishment of Hypothesis 1.

Table 1. Results of the Benchmark Regression.

VARIABLES	(1) FCP	(2) FCP	(3) FCP	(4) FCP	(5) FCP
Fintech	0.007* (1.84)	0.010** (2.27)	0.012*** (2.84)	0.011** (2.48)	0.011** (2.55)
Controls	NO	YES	NO	YES	YES
Industry FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Observations	371	371	371	371	371

4.2. Robustness Tests

4.2.1. Replacing the Regression Method by Changing Fixed Effects to Random Effects

To further verify the robustness of the regression results, referring to the research approach of Smith (2020), the fixed effects in the model are replaced with random effects for the robustness test research. The regression results are shown in columns (3) (4) of Table 1.

Column (2) of Table 1 presents the regression results without adding control variables. The coefficient is 0.012, which is significant at the high 1% level. This indicates that in the random effects model without putting on control variables, fintech (Fintech) has a significant positive impact on the dependent variable (FCP), preliminarily suggesting that the original regression results have a certain degree of robustness. Column (4) of Table 1 shows the regression results after adding control variables. The coefficient of the independent variable (FCP) is 0.011, which is significant at the 5% level. Although the coefficient has slightly decreased, it is still significantly positive, further indicating that the positive impact of fintech remains robust after controlling for other variables.

4.2.2. Lagged Explanatory Variable

The robustness test is conducted again by using the lagged one-period explanatory variable (Fintech), as shown in column (5) of Table1: Compared with column (4), the coefficient and significance of the explanatory variable (Fintech) do not change, which indicates that the positive impact of fintech on the degree of enterprise financialization remains robust when using the lagged one-period explanatory variable.

4.2.3. Endogeneity test

This article will explain the lagged variables by one period and use system GMM for testing to address endogeneity issues that may arise from mutual causality. The specific analysis results are shown in Table 2. According to Table 2, there is no significant change in the significance of fintech and corporate financialization, and the p-values of Hansen and AR (2) test statistics are both greater than 10%, which cannot reject the null hypothesis and indicate that there is no auto-correlation. Therefore, the setting of the GMM model for the system is reasonable and proves that the research results are robust.

Table 2. System GMM Inspection.

VARIABLES	GMM
FCP	0.963*** (4.90)
FinTech	0.131* (2.01)
Control variables	YES
Sample number	371
Air(1)	0.024
Air(2)	0.422
Hansen	0.989

4.3. Mediating Effect Test

First, the influence of fintech on the degree of enterprise financialization is tested. The regression results are shown in column (1) of Table2. According to the regression results in Table 1, it can be known that fintech can significantly enhance the financialization level of enterprises. Second, the impact of fintech on the mediating variable resource allocation efficiency is tested. The test results are shown in column (2) of Table 2. According to the regression results in column (2) of Table 2, the coefficient of Fintech is 0.004 and is significant at the 5% level, which indicates that fintech (Fintech) has a significant positive impact on resource allocation efficiency (CAE), preliminarily verifying the establishment of Hypothesis 2. Finally, the independent variable (Fintech) and the mediating variable (CAE) are simultaneously included in the regression equation to test the impact on the dependent variable (FCP), as shown in arrange (3) of Table 2. The coefficient of Fintech is 0.009 and is significant at the 5% level. Compared with the coefficient of Fintech in the single regression in the first step, such as in column (1), it has decreased but is still significant. Meanwhile, the coefficient of CAE is also significant. Based on these results, it can be preliminarily judged that there is a partial mediating effect, that is, the impact of fintech on the degree of enterprise financialization is partly achieved through resource allocation efficiency, verifying the establishment of Hypothesis 3.

Table 3. Results of the Mediation Effect Test

VARIABLES	(1) FCP	(2) CAE	(3) FCP
Fintech	0.010** (2.27)	0.004** (2.29)	0.009** (2.06)
CAE			0.214* (1.71)
Controls	YES	YES	YES
Constant	1.167*** (4.84)	-0.088 (-0.87)	1.186*** (4.92)
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Observations	371	371	371
R-squared	0.133	0.687	0.140

4.4. Heterogeneity Analysis

4.4.1. Analysis of Property Rights Heterogeneity

According to the differences in enterprise property rights, enterprises are divided into state-owned enterprises and non-state-owned enterprises, as shown in columns (1) and (2) as Table 3 illustrates. The coefficient of Fintech for state-owned enterprises is 0.000 and is significant, while the coefficient of Fintech for non-state-owned enterprises is 0.023 and is significant at the 1% level. This may be because the business decisions and resource allocation of state-owned enterprises are restricted by various policy and institutional factors, making it difficult for fintech to play a role in enhancing the degree of enterprise financialization. On the other hand, non-state-owned enterprises usually have more flexible market mechanisms and operational autonomy, enabling them to respond more quickly to market changes and changes in the factors represented by this independent variable. Therefore, fintech can have a significant positive impact on the degree of financialization of enterprises.

Table 4. Results of Heterogeneity Analysis.

VARIABLES	(1) state-owned	(2) Non state-owned	(3) large-scale	(4) small-scale
Fintech	0.000 (0.03)	0.023*** (3.38)	0.002 (0.77)	0.010** (2.10)
Controls	YES	YES	YES	YES
Constant	1.526** (2.26)	1.477*** (4.62)	1.269*** (6.25)	1.429*** (7.37)
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	162	209	177	198
R-squared	0.152	0.142	0.760	0.740

4.4.2. Scale Heterogeneity

From the differences in enterprise scale, enterprises are divided into large-scale and small-scale ones. The results of the scale heterogeneity analysis are shown in columns (3) and (4) of Table 4: In large-scale enterprises, the co-efficient of Fintech is 0.002 and is not significant. This may be because large-scale enterprises, due to their own scale advantages, diversified operations, and complex internal management structures, make it difficult for the development of fintech to have an obvious promoting effect on their degree of financialization. However, in small-scale enterprises, the coefficient of Fintech is 0.010 and is significant at the 5% level, indicating that Fintech has a significant positive impact on FCP. This may be because small-scale enterprises are usually more flexible and can respond more quickly to market changes and new opportunities (such as the factors represented by this independent variable), and can adjust their business strategies more quickly.

5. Conclusions and Recommendations

5.1. Research Conclusions

From the data of listed companies in the financial industry from 2008 to 2022, this paper has conducted an in-depth exploration of the influence of fintech on the degree of enterprise financialization and analyzed the role of resource allocation efficiency in this core relationship. The research findings are as follows: First of all, fintech has a positive effect on promoting the degree of enterprise financialization, and this positive effect remains stable after undergoing various robustness tests. Second, there are differences in the impact of fintech on the development degree of enterprise financialization. For non-nation-owned enterprises and small-scale enterprises, the facilitating effect of fintech on the degree of enterprise financialization is more significant. Third, resource allocation efficiency has a significant mediating effect between fintech and the degree of enterprise financialization. However, this study only limited the sample to listed companies in the financial industry, with a small sample size. The generalizability of its research conclusions and the reference value of its research recommendations are limited.

5.2. Relevant Recommendations

Strengthen the Application of Innovative Technologies to Break Down Financial Information Barriers.

In the context of the digital economy, if financial institutions want to stand out in the fierce market competition and effectively serve enterprises, it is essential to strengthen the application of innovative technologies. This is because innovative technologies can break through the time and space limitations of traditional financial services, greatly expand the coverage of financial services, enabling financial institutions to reach a broader customer base. In the supply chain finance scenario, through blockchain, the credit status of enterprises at each link can be accurately evaluated. Each transaction record is securely stored on the blockchain, forming a reliable credit database. Based on this, financial institutions can provide more accurate financial services for enterprises, avoiding credit risks caused by information opacity. **Optimize the Supply of Sci-tech Financial Products and Strengthen the Role of Resource Allocation Efficiency in Improving the Degree of Financialization**

Financial institutions need to continuously optimize the supply of sci-tech financial products. Different enterprises have different operating characteristics, risk preferences, and capital requirements. Financial institutions should provide personalized financial product portfolios based on these characteristics of enterprises. For example, for technology-based enterprises in the growth stage, financial institutions can provide diversified financing products such as equity financing and convertible bonds to meet the capital needs of enterprises at different development stages. **Draw on International Experience to Develop a Professional and Multi-level Sci-tech Financial System**

In constructing the sci-tech financial system, we can fully draw on international experience. Firstly, the regulatory sandbox mechanism can be introduced. While encouraging financial innovation, it can effectively control the potential risks brought by innovation and provide a relatively safe innovation test environment for fintech enterprises. In this environment, fintech enterprises can test new products and services within a certain regulatory framework. Regulatory authorities can timely understand the risks that financial innovation may bring and formulate corresponding regulatory measures.

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