

The Development of Digital Finance and Corporate Financialization

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Abstract: The development of digital inclusive finance is changing the payment and clearing structure of traditional finance and the way financial information is matched. As a combination of finance and technology, digital finance offers clear benefits, as it involves almost all financial business in China. Digital finance is becoming an integral part of the financial system. However, the impact of digital financial inclusion on the financialization of enterprises remains unclear. Based on empirical tests, this paper uses the enterprise data of Shanghai and Shenzhen A-shares from 2011 to 2018 to measure whether the influence of digital financial inclusion is promoting or inhibiting. It is found that digital inclusive finance promotes the degree of financialization of enterprises, and the above conclusion still holds after robustness tests. The research of this paper provides new ideas for enterprises to adapt to the development of the digital economy.

1. Introduction

Since its birth, digital finance has swept the financial field with irresistible momentum, and its speed of development in China is even more amazing. As of 2019, Alipay and WeChat Pay, representative enterprises in the field of digital financial payment in China, have more than 1 billion users respectively, and such users are highly dependent on online payment. Their travel, medical treatment, daily expenditure, and even investment and financing are all completed by digital financial payment means. In addition, some online banks (such as Ant Financial Online Bank, Mixinwang Bank, and Tencent Webank) have less than 2,000 employees, but they provide online loan services for tens of millions of enterprises and individuals. The rapid popularization of digital finance in China is inseparable from the following three factors: the relatively loose regulatory system of digital finance, digital financial products, and services effectively fill the gap of traditional finance, and the continuous progress of network information technology mainly based on mobile smartphones, cloud computing, and big data technology.[1]

Digital finance is an important innovation that promotes financial reform in the past few years. As an emerging financial industry, digital finance has brought profound influence to traditional finance. Studies have focused on the role of digital finance at the enterprise level. Most scholars have affirmed the positive effects of digital finance development, such as alleviating information asymmetry, promoting entrepreneurship, and improving financing availability. However, some scholars have pointed out the problems existing in the development of digital finance at the present stage, such as enhancing the invisibility and complexity of financial risks and providing opportunities for financial arbitrage for entity enterprises to evade regulation. At the present stage, there is no universal definition of fintech. In the broadest sense, it is the use of innovative information technology in financial services. [2,3]

China's digital finance has a distinctive feature of inclusive finance, enabling enterprises and poor people in remote and economically backward areas to obtain financial services at lower economic and time costs. At the same time, the successful experience of China's digital finance in promoting the development of inclusive finance has provided an important practical reference for other countries.

Digital finance has reshaped the existing financial ecology and changed the investment and financing environment of enterprises, which will inevitably affect the financial investment decisions

of enterprises. Then, in the process of the development of Digital finance in China, do the changes of corporate cash holdings and the existing structure formed by the low level of supervision and low entry threshold affect the financialization of enterprises? If so, is the impact of cash holdings more significant, or is the impact of corporate arbitrage caused by low entry barriers more significant?

This paper tries to explore the following questions: Does the development of digital finance promote or inhibit the financialization of enterprises? The answers to the above questions will help us to have a more comprehensive understanding of the actual role of digital finance in China's economic development, and thus put forward policy suggestions to guide the healthy development of digital finance, achieve high-quality economic development, and promote the transformation and upgrading of industrial structure.

The marginal contribution of this paper is mainly reflected in the following aspects: First, by exploring the influence of digital finance development on enterprise financialization, this paper expands the research on topics related to macro digital technology development and micro-enterprise behavior to some extent. While revealing the influence of digital finance development on corporate cash holding behavior and corporate arbitrage behavior, it also enriches the research on the influencing factors and economic consequences of corporate financialization. Second, most previous studies only analyzed the relationship between corporate financialization and R&D innovation investment, the relationship between the development of digital inclusive finance and the alleviation of corporate financing constraints, as well as the development process and regulatory enlightenment of digital finance in China.[4] Thirdly, there have been abundant studies on the inclusion of digital finance at home and abroad. Most of the literature focuses on the impact of interest rate liberalization on enterprises' financing constraints, while the relevant analysis of digital finance on micro-enterprises is rarely involved. This paper considers the possible economic effects and arbitrage strategies caused by the development of digital finance at the same time, providing a new perspective for the subsequent research on digital finance regulation.

The structure of the remainder is arranged as follows: The second part is research design; The third part is an empirical test and results analysis, including testing the influence of digital finance development on enterprise financialization, and testing the motivation of enterprise financialization under the influence of digital finance development; The last part is the conclusion and policy suggestions.

2. Research design

2.1 Data sources.

Data (from 2011-2018) in this paper is derived from the CSMAR series database, a research-based financial data system independently developed by Shenzhen Guotai 'a Company. CSMAR database is an economic and financial database developed based on the requirements of academic research and the professional standards of international well-known databases such as UNIVERSITY of Chicago CRSP, STANDARD & Poor's Compustat, New York Stock Exchange TAQ, I/B/E/S, and Thomson. A high-precision research database covering China's securities, futures, foreign exchange, macro, industry, and other major economic and financial fields is a basic tool for investment and empirical research. [4]

The digital financial inclusion index used in this paper is the "Peking University Digital Financial Inclusion Index", which is compiled by a joint research group composed of Peking University Digital Finance Research Center and Ant Financial Group. The data includes 31 provinces (municipalities and autonomous regions, referred to as "provinces"), 337 cities (regions, autonomous prefectures, and leagues, referred to as "cities"), and nearly 2,800 counties (county-level cities, banners, and municipal districts, referred to as "counties") in mainland China. Data is missing in some areas. Data for Hong Kong, Macao, and Taiwan are not included. Based on the data of enterprises in Shanghai and Shenzhen, this paper focuses on the relationship between the development degree of digital inclusive finance and the financialization index of enterprises.

We screened the samples according to the following procedures: (1) to apply the fixed-effect model, we retained the 2011 and 2018 data and formed a balanced panel data to control heterogeneity, (2) to eliminate the interference to measure the degree of financialization of enterprises, the samples of companies in the financial industry are excluded, (3) eliminate the sample of companies that are ST and *ST, (4) eliminate samples that lack enterprise characteristic data, (5) to eliminate the influence of extreme values, the main continuous variables are treated with bilateral indentation at the 1% level.

2.2 Model specification and Variable definition.

The purpose of this paper is to study the influence of digital finance development on enterprise financialization in Shanghai and Shenzhen stock markets since 2011. DF_i is the explained variable, representing the degree of financialization. $Index_i$ is the variable of concern and represents the aggregate Index of the development of digital inclusive finance. Various factors are affecting the financialization of enterprises. Based on the analysis, we decided to use the OLS regression model in econometrics to accurately and concisely express the relationship between various factors included in the research scope with appropriate mathematical relations. According to the collected data, Stata software is used to get the relationship between explained variables, concerning variables and control variables. [5]

$$DF_i = \alpha_0 + \alpha_1 \times Index_i + x_i' \beta + \varepsilon_i \quad (1)$$

Based on the existing literature [6], this paper introduces enterprise size (Size), enterprise age of listing (Age), profitability (ROA), and asset-liability ratio (Lev) into the model, and also controls corporate governance levels, such as Board Size (Board) and proportion of independent directors (Indep). The following table gives the names and definitions of each variable.

Table. 1 Variables' definition

Variable categories	Variable symbol	The variable name	Measuring diameter
Explained variable	DF	The degree of financialization	Financial assets/ total assets
Explanatory variable	Index	The Aggregate Index of the development of digital inclusive finance	According to the Peking University Digital Financial Inclusion Index
Control variables	Age	Age of listing	Year of data-year of launch
	Age-sq	Company listing age squared	(Year of data-year of launch) ²
	Size	Enterprise Size	The natural log of total business assets at the end of the period
	Lev	Corporate leverage	Ln (total liabilities)
	Top1	Ownership concentration	The shareholding ratio of the largest shareholder
	Board	Board size	The number of directors
	Indep	The proportion of independent directors	Number of independent directors/ number of directors
	Salary	Directors' salary	Ln (directors' salary)
	ROA	Profitability	Net profit/ total assets
	SOE=1	Ownership nature	State-owned enterprises
Foreign=1	Ownership nature	The foreign capital enterprises	

2.3 Descriptive statistical analysis.

Descriptive statistics are shown in Table 1. To exclude extreme values, the continuous variables in this paper have been processed by 1% winsorize. In addition, to keep the sample as much as possible, we take its logarithm as the total asset of the company. It should be noted that there is no asset lying beneath zero, so we don't need to worry about the extreme value generated by this data processing method. The descriptive statistical results of the main variables of concern are shown in the table below. As can be seen from the table, the mean level of digital finance index of companies except financial sector is 183.8783, the maximum value and minimum value are 302.9827 and 23.88 respectively, indicating that there is a large gap in the degree of digital inclusive finance among enterprises, and some enterprises have a high degree of digitalization. It further shows that the use of science and technology for financial development by enterprises is gradually regarded as a universal behavior. By analyzing the results of the descriptive statistics of the degree of financialization (DF) of enterprises, it can be seen that the average value is 0.0356, the standard deviation is 0.0715, the maximum value and minimum value are 0.5748 and 0 respectively, with a large gap between the extreme values. Therefore, it can be seen that some enterprises are still not financialized.

From the results of control variables, the mean size of enterprises (Size) is 22.3061, the mean leverage of enterprises (Lev) is 21.3119, and the mean profitability (ROA) is 4.23%. The minimum value of enterprise age (Age) is 0, and the maximum value is 25, indicating that the sample includes newly established companies as well as large enterprises with earlier establishment practices. On the whole, the data of a-share listed companies in Shanghai and Shenzhen provide good data support for studying the economic impact of digital financial inclusion.

Table. 2 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
DF	13344	.0356	.0715	0	.5748
Index	13344	183.8783	65.0492	23.88	302.9827
Age	13344	11.0029	6.7515	0	25
Age-sq	13344	166.6438	163.4044	0	625
Size	13344	22.3061	1.3372	19.0444	26.8421
Lev	13344	21.3119	1.7459	17.4067	26.5411
Top1	13344	34.8595	15.1917	3	89.99
SOE=1	13344	.4353	.4958	0	1
Foreign=1	13344	.0397	.1953	0	1
Board	13344	8.739	1.7669	5	15
Indep	13344	3.2229	.5946	2	5
Salary	13344	14.8568	.7905	11.9685	16.9982
ROA	13344	.0423	.0556	-.3281	.2342

3. Empirical Result

3.1 Benchmark result.

The following table shows the empirical results of benchmark regression. It is found that the development of digital inclusive finance has a positive correlation with the financialization of enterprises. The Index coefficient is positive and significant at the 1% level. This shows that the development of digital finance promotes the financialization of enterprises. Specifically, a one-unit increase in the digital finance index leads to a 0.04% increase in corporate financialization.

Based on the above results, this paper argues that, first of all, digital inclusive finance can process a large amount of data based on the extensive application of big data and other advanced technologies, which greatly reduces the information asymmetry between market players. [6] Second, digital inclusive finance breaks the geographical restrictions of traditional finance and reduces the cost of financial investment and other activities of local enterprises. But at the same time, the development

of enterprise financialization shows the tendency of entity enterprises as a whole to "get out of reality and into the virtual". [7]

Table. 3 Benchmark Regression

VARIABLES	(1) OLS Financialization	(2) OLS Financialization
<i>Indexi</i>	0.0004*** (0.0000)	0.0004*** (0.0000)
Age		0.0038*** (0.0004)
Age-sq		-0.0000 (0.0000)
Ln asset		0.0098*** (0.0015)
Ln debt		-0.0115*** (0.0012)
Top1		-0.0000 (0.0000)
SOE=1		-0.0063*** (0.0016)
Foreign=1		0.0113*** (0.0040)
Board		-0.0020*** (0.0005)
Indep		0.0029*** (0.0014)
Salary		-0.0013 (0.0009)
ROA		-0.0253** (0.0127)
Constant	0.0041 (0.0030)	0.0290** (0.0137)
Observations	13344	13344
R-squared	0.0867	0.1514
Year Dummy	Yes	Yes
Industry Effect	Yes	Yes

3.2 Robustness test.

Next, the robustness of the empirical hypothesis and regression results is tested. We used the OLS estimation method and PANEL method, and the final results showed that both reached the same conclusion. Therefore, the accuracy of our study is verified.

Table. 4 Robustness test

VARIABLES	(1) Panel FE Financialization	(2) Panel FE Financialization
<i>Indexi</i>	0.0004***	0.0004***
	(0.0001)	(0.0001)
Age		-0.0029
		(0.0094)
Age-sq		-0.0000
		(0.0000)
Ln asset		-0.0097***
		(0.0036)
Ln debt		0.0003
		(0.0025)
Top1		0.0000
		(0.0001)
SOE=1		-0.0035
		(0.0072)
Foreign=1		-0.0132
		(0.0092)
Board		-0.0005
		(0.0007)
Indep		0.0005
		(0.0018)
Salary		0.0014
		(0.0015)
ROA		-0.0261**
		(0.0132)
Constant	-0.0073	0.2058**
	(0.0067)	(0.0903)
Observations	13344	13344
R-squared	0.0952	0.1051
Number of ids	1668	1668
Year Dummy	Yes	Yes
Industry Effect	Yes	Yes

4. Heterogeneity analysis

Objectively speaking, the aforementioned research has carried out a comprehensive study on the influence of digital financial inclusion on the financialization of enterprises. However, such research does not take the asset scale of enterprises into account, which may cause omission bias. Indeed, with different objective functions and different resource endowments of enterprises, the financialization of enterprises may be greatly different in the face of the same digital financial inclusion degree. More importantly, digital inclusive finance should have certain typical "inclusive characteristics". Given this, this paper classifies enterprises according to their size (whether their total assets are above the 50th percentile or not), to accurately capture the differential impact of digital inclusive finance on the financialization of strong enterprises. The regression results are shown in Table 5.

It is found that the interaction between the two is not significant. Therefore, it can be considered that there is no heterogeneity in the financialization impact of digital financial inclusion on enterprises of different sizes (large and small). In this regard, this paper explains that large-scale enterprises and small-scale enterprises suffer from the positive impact of scientific and technological progress and the welfare period when the legal supervision system does not match the development speed of the industry. [1, 8]

Table. 5 Heterogeneity analysis

VARIABLES	(1) OLS Financialization	(2) OLS Financialization
<i>Indexi</i>	0.0004*** (0.0000)	0.0004*** (0.0000)
Dummy	-0.0260 (0.0247)	-0.0297 (0.0248)
Dummy # <i>Indexi</i>	0.0000 (0.0001)	0.0001 (0.0001)
Age		0.0037***s (0.0004)
Age-sq		-0.0000 (0.0000)
Ln asset		0.0101*** (0.0015)
Ln debt		-0.0114*** (0.0012)
Top1		-0.0000 (0.0000)
SOE=1		-0.0063*** (0.0016)
Foreign=1		0.0113*** (0.0040)
Board		-0.0020*** (0.0005)
Indep		0.0029** (0.0014)
Ln salary		-0.0013 (0.0009)
ROA		-0.0224* (0.0126)
Constant	0.0044 (0.0031)	0.0216 (0.0140)
Observations	13344	13344
R-squared	0.0877	0.1520
Year Dummy	Yes	Yes
Industry Effect	Yes	Yes

5. Conclusion

Based on the data set of listed companies in Shanghai and Shenzhen A-shares from 2011 to 2018 and the "Peking University Digital Financial Inclusion Index", this paper studies the relationship between the development of digital financial inclusion and the financialization of enterprises. Furthermore, the enterprise-scale is further brought into the research framework, to more comprehensively investigate the difference of influence of digital inclusive finance development on enterprise financialization, and the specific conclusions are as follows.

First, the development of digital inclusive finance has promoted the financialization of enterprises. The study found that the higher the development degree of digital inclusive finance, the higher the financialization degree of enterprises in the region. Second, digital financial inclusion has no heterogeneous influence on the financialization development of enterprises with different attributes. In particular, small businesses and high-tech companies are affected by digital financial inclusion to roughly the same extent. Based on existing research, it is found that financialization of entity enterprise damages the future core performance, and reveals that the magnitude of the "crowding out" effect is larger than the magnitude of the "reservoir" effect. [9]

This research conclusion has important policy implications for promoting the development of digital inclusive finance scientifically and promoting the transformation of the economic momentum of real enterprises in the new era.

First, formulate and improve the long-term mechanism for the development of digital inclusive finance. We should give full play to the strategic leading role of the government in digital inclusive finance, and make precise efforts in a multi-pronged manner, hoping to promote its deep integration with industrial development, to deeply alleviate the negative impact of corporate financialization. Second, as China's financial sector further integrates into the global financial system, it is imperative to learn from advanced European practices and improve the regulatory capacity of the government and the competitiveness of financial institutions. Thus promote the financial development of entity enterprises and the development of the company is good. As technology is increasingly used for financial services, so too should it be used for financial regulation, improving regulation by the same proportion or even more. Third, deepen financial supply-side structural reform and improve regional financial infrastructure. [5,10]

With the deepening of finance, how to adapt to the development trend and use digital inclusive finance to better promote the development of the real economy will be an important issue. Especially for entrepreneurs, they should have a long-term strategic vision: learn how to use the convenience brought by the development of digital inclusive finance to serve the development of the main body of the enterprise, instead of blindly increasing financial investment. [9]

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