



The Development of Digital Financial Inclusion and Corporate Financialization

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Abstract. The digital economy and digital finance are developing rapidly in China. This paper examines the relationship between the development of digital finance and the degree of corporate financialization. The paper uses computer technology and numerical simulation methods to estimate and formulate OLS and Panel FE models, which are used to answer the question of the impact of digital technology on the financialization of firms. The empirical results show that the development of digital finance promoted the financialization of enterprises. Benchmark regression shows that a 1 unit increase in the Digital Finance Index leads to a 0.04% increase in financialization. Heterogeneity analysis shows no scale effect in the impact of digital finance development on corporate financialization. Based on this, this paper suggests that deviating from the real to the virtual caused by over-financialization should be avoided in the digital era.

Keywords: Digital financial · Corporate financialization · de-realization

1 Introduction

The “de-realization” of the real economy is a hot topic in China’s current economic development [1], and the financialization of China’s real economy has become a severe problem in recent years. Chinese companies have invested heavily in the virtual economy, such as finance, bonds, and real estate, which poses a potential threat to the long-term development of China’s real economy.

China’s traditional financial system is flawed and financial institutions have long held a monopoly [2]. SMEs and others have had to pay expensive financing costs, mainly inhibiting the sustainable growth of the real economy [3]. The emergence of digital finance has dramatically compensated for the imperfections of traditional finance. Digital finance combines traditional finance with the Internet to enable new financial business models, such as digital technology for financing and payments [4]. Digital finance alleviates the problem of enterprise financing, strengthens the natural function of financial services, promotes the benign development of the economy [5], activates the vitality of the odd, reduces the cost of enterprise financing, facilitates the transformation and upgrading of the real economy, and also curbs the possibility of real enterprises “de-realizing” [6].

This paper explores the relationship between digital finance and the financialization of businesses. It finds that digital finance has prompted the financialization of firms. Still, at the same time, it is not something that has a positive impact on the financialization of firms. When actual firms take financial operations more seriously, the real economy suffers.

Structure of this paper: For the analysis of variables on the impact of digital finance on the financialization of firms, benchmark regressions, heterogeneity analysis, and robustness analysis is applied. Specific conclusions are drawn from the data, followed by additions and clarifications to the current discourse.

2 Literature Review

Digital finance is the combination of digital technology and financial services, which greatly reduces the cost of financial services, improves the efficiency of financial services, and makes up for the shortcomings of traditional finance [7]. Digital technology is also used for financing, investment, payment, and other new financial business models [8]. Chinese digital finance has been on a steady rise over the past three decades and today China leads the world in digital finance. Financial experts point out that the development of digital finance is on an upward trend, while the development of digital finance in China has significantly increased the availability of financial services for businesses, mainly represented by mobile payments, which are more common and convenient in life and every day. Chinese finance has undergone three major changes. The first is that consumers, too commonly accustomed to paying with banks, are now more inclined to pay with WeChat or Alipay under the influence of digital finance, resulting in a change in the overall financial payment channel [9]. The second is the change in the structure of China's switching and clearing market, which was once a monopoly, and the current existence of two switching and clearing institutions, UnionPay and Netfrix, which are responsible for traditional online banking and online payments by Feiying Huang payment institutions respectively, broadening the scope of financial services. The third is the change in the way data is used in the course of the development of digital finance. Future financial institutions and the Internet will most likely form data transactions, which will be more conducive to the integrated use of data and risk assessment, effectively alleviating the information asymmetry problems once faced by traditional finance and greatly improving service efficiency and service scope. In the future, the development of digital finance is extremely promising, and digital finance will bring benefits as well as risks and challenges. According to the survey, the biggest advantage currently demonstrated by digital finance is to support the development and promotion of inclusive finance [10], and the use of a certain indicator or a certain dimensional indicator in inclusive finance may lead to a one-sided interpretation of inclusive finance, on the one hand, through a comprehensive analysis of big data such as for social media accounts and online shopping platforms to make credit assessments. On the other hand, through the virtual scenario built by the Internet platform, which tightly connects tens or even hundreds of millions of mobile terminals, the assessment results are finally obtained to overcome the development of financial inclusion.

The moderate fictionalization of real estate companies can help to promote performance and alleviate financing constraints, but the same use of corporate fictionalization

can be seriously detrimental to the companies themselves, and the same use of corporate fiction Digital finance combines digital technology and financial services, which significantly reduces the cost of financial services, improves the efficiency of financial services, and makes up for the shortcomings of traditional finance [7]. Digital technology is also used for financing, investment, payment, and other new financial business models [8]. Chinese digital finance has been on a steady rise over the past three decades, and today, China leads the world in digital finance. Financial experts point out that the development of digital finance is on an upward trend. In contrast, the development of digital finance in China has significantly increased the availability of financial services for businesses, mainly represented by mobile payments, which are more common and convenient every day. Chinese finance has undergone three significant changes. The first is that consumers, too commonly accustomed to paying with banks, are now more inclined to pay with WeChat or Alipay under digital finance, resulting in a change in the overall financial payment channel [9]. The second is the change in the structure of China's switching and clearing market, which was once a monopoly, and the current existence of two switching and clearing institutions, UnionPay and Netfili, which are responsible for traditional online banking and online payments by Feiyang Huang payment institutions respectively, broadening the scope of financial services. The third is the change in how data is used in the development of digital finance. Future financial institutions and the Internet will most likely form data transactions, which will be more conducive to the integrated use of data and risk assessment, effectively alleviating the information asymmetry problems once faced by traditional finance and significantly improving service efficiency and service scope. In the future, the development of digital finance will be auspicious, and digital finance will bring benefits and risks, and challenges. According to the survey, the most significant advantage currently demonstrated by digital finance is to support the development and promotion of inclusive finance [11]. Using a particular indicator or a particular dimensional indicator in inclusive finance may lead to a one-sided interpretation of inclusive finance. On the one hand, through a comprehensive analysis of big data such as social media accounts and online shopping platforms to make credit assessments. On the other hand, through the virtual scenario built by the Internet platform, which tightly connects tens or even hundreds of millions of mobile terminals, the assessment results are finally obtained to overcome the development of financial inclusion.

The moderate fictionalization of real estate companies can help to promote performance and alleviate financing constraints. However, the same use of corporate fictionalization can be seriously detrimental to the companies themselves. The exact use of corporate fictionalization can be seriously detrimental to the companies themselves and society if it is not disciplined.

This is why two aspects of financialization are highlighted here. The first is that it has an investment role, and the second is that it also has the risk of leading to the "de-realization" of the business.

By allocating a certain amount of investment in financial assets, the company can turn some of its decaying physical assets into financial assets, thus gaining more benefits and increasing the value of the company while making the company more diversified in terms of asset investment, which also has the effect of diversifying risks and ultimately

getting a further increase in the value of the company. At the same time, the use of debt financing, the use of corporate financial leverage, and the use of the tax shield effect, while ensuring that corporate control is not affected, can also lead to an increase in corporate value. However, when a company relies too much on investment in financial assets, it can lead to many capital resources being tied up, which can affect normal development.

At the microeconomic level, de-realization is mainly reflected in the financialization of enterprises, which is the phenomenon of non-financial enterprises increasing their investment in financial assets and decreasing their productive investment.

Most studies now show that the development of digital finance inhibits the fictionalization of the real sector. Analysis shows that digital finance inhibits the poisoning of the cost of bonds on the profits earned by companies, reduces the gap between the financial sector and the real sector in terms of return on net assets, and increases the gross operating margin of companies. The inhibiting effect of digital finance on the fictionalization of corporate is more pronounced in SMEs and private enterprises [12]. However, equally, digital finance promotes positive interaction between the virtual and real economies while reducing corporate financing costs, stimulating the vitality of real enterprises, and promoting opportunities for corporate transformation and upgrading. In today's era of customer demand focusing on the premise of demand upgrading, individuals and enterprises rely more and more heavily on digital finance. The younger generation is more eager for convenience [13], efficiency, and demand-understanding financial services demands, which is the difference between digital finance and traditional finance; at the same time, in today's Chinese market, SMEs form an aggregation [14], which also represents an increase in the specialization of SMEs and accelerates the aggregation to the upper and lower ends of the industrial chain. In the face of the rapid development of the Internet, the expansion of internal applications of large enterprises to a large-scale manufacturing resource integration model has also intensified the impact of digital finance on the fictionalization of enterprises [2].

This paper focuses on the impact of digital finance development on the degree of financialization of corporate. It analyzes whether there is heterogeneity in the impact of digital finance development on corporate of different sizes.

First: promoting the development of digital finance, while whether there is an impact on the risk management of enterprise fictionalization, small and medium-sized enterprises in traditional finance, loans exist in the loan amount is not high enough frequency, coverage area and the scope of customers involved is not large enough. Concerning the above publication, digital finance helps some individuals and SMEs to grasp the opportunity to enable more businesses to be helped, prompting the development of the financial sector.

Second: whether the over-reliance of corporate fictionalization on the loans offered by digital finance, while at the same time leading to a small cost and significant collapse of the financial market because of features such as low threshold, convenience, and efficiency, has further led to a small and large collapse of the financial market [15].

Because there is little information available on whether digital finance has a significant impact on corporate fictionalization, more in-depth investigation and exploration are needed on whether the development of digital finance will affect corporate fictionalization.

3 Model and Variable

3.1 Data Source

The data in this paper come from the Digital Inclusive Finance Index of Peking University from 2011 to 2018 and the data of Shanghai and Shenzhen A-share companies from WIND Financial Terminal, with the data interval from 2011 to 2018. The data were processed as follows: the sample of companies in the financial sector was excluded, the sample of companies in the ST and *ST sectors was excluded, the sample of variables with missing values was excluded, and the effect of extreme values was considered, and the main continuous variables were bilaterally reduced by 1% using the winsorize method. A total of four tables are applied in this paper, using the total sample (unbalanced panel) in the benchmark and heterogeneity analyses, the balanced panel, and FE estimates in the robustness tests.

3.2 Variable Definition

The data comes from the Peking University Digital Inclusive Finance Index 2018, jointly compiled by the Peking University Digital Finance Research Center and Ant Financial Services Group, of which the data collection covers 337 cities in 31 provinces, autonomous regions, and municipalities directly under the Central Government of China. The report provides a comprehensive and rigorous assessment of a region's digital financial coverage, demonstrating the breadth of digital financial coverage, the depth of use, and the degree of digitization. Also the larger the indicator, the better the development of digital finance in the region.

The financialization of an enterprise is measured using the proportion of financial assets held by the enterprise to total assets at the end of the period. Financial assets are defined as the sum of financial assets held for trading, derivative financial assets, net loans and advances granted, net available-for-sale financial assets, net held-to-maturity investments, and net investment properties.

With reference to previous relevant studies, the control variables selected include total assets at the end of the period, total liabilities at the end of the period, the length of time the firm has been listed, the proportion of shares held by the largest shareholder, state-owned enterprises, foreign-owned enterprises, the board size, the number of independent directors, executive remuneration, and return on assets. Where state-owned and foreign-owned enterprises = 1, otherwise 0.

3.3 Model

To test the impact of digital finance on the financialization of firms, we constructed the following fixed effects regression model with the DoF (degree of financialization) as the

Table 1. Summary statistics

Variable	Mean	Std. Dev.	Min	Max
Aggregate Index	193.9067	64.4954	23.1	302.9827
Degree of Financialization	0.0324	0.0695	0	0.5748
Asset, unit: 10000 Yuan	1309503	4177095.3	18657.975	45434239
Debt, unit: 10000 Yuan	802120.3	2967420.7	3627.572	33624640
Age	9.5128	7.2835	0	25
top1, %	35.082	15.2319	0.29	99
SOE = 1	0.3766	0.4845	0	1
Foreign = 1	0.0482	0.2141	0	1
Board Size	8.6247	1.7189	5	15
No. of Independent Director	3.1852	0.5694	2	5
Salary, unit: 10000 Yuan	370.8776	357.9202	15.7712	2411.08
ROA, %	4.4138	6.3487	-32.8121	23.4179

response variable and the Aggregate index as the variable of interest:

$$SA\ index_{it} = \alpha_0 + \beta_1 Coverage\ breadth_{it} + X_{it}\beta_2 + \sum Year + \sum Industry + \varepsilon_{it} \quad (1)$$

3.4 Descriptive Statistics

Table 1 reports the results of the descriptive statistics of the variables. The mean value of DoF (degree of financialization) is 0.0324, indicating that the average share of financial assets to total assets is 3.24%. The maximum value of DoF is 0.5748, indicating that the share of financial assets to total assets is as high as 57.48%, implying that the problem of financialization of some real enterprises is serious.

4 Empirical Results

4.1 Benchmark Regression

Table 2 reports the results of regressions of digital financial development on the financialization of firms. The first column shows the results of regressions without industry and time fixed effects, along with no control variables. The second column shows the results of regressions with all control variables added, with a coefficient of 0.0001 on the composite index, where a one-unit increase in the digital inclusion index results in a 0.01% increase in the level of firm financialization. The third column shows the results of the regression with industry and time fixed effects, along with no control variables. The fourth column shows the results of the regression with all control variables added, with a coefficient on the composite index of 0.0004. Each unit increase in the digital

Table 2. Benchmark regression

VARIABLES	(1) OLS DoF	(2) OLS DoF	(3) OLS DoF	(4) OLS DoF
Aggregate Index	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0003*** (0.0000)	0.0004*** (0.0000)
Age		0.0024*** (0.0003)		0.0031*** (0.0003)
Age-sq		0.0000** (0.0000)		-0.0000 (0.0000)
Ln asset		0.0060*** (0.0013)		0.0097*** (0.0013)
Ln debt		-0.0075*** (0.0010)		-0.0108*** (0.0010)
top1		0.0000 (0.0000)		-0.0000 (0.0000)
SOE = 1		-0.0069*** (0.0014)		-0.0033** (0.0015)
Foreign = 1		0.0097*** (0.0030)		0.0096*** (0.0028)
Board Size		-0.0023*** (0.0004)		-0.0015*** (0.0004)
No. of Independent Director		0.0036*** (0.0012)		0.0025** (0.0012)
Ln salary		0.0012 (0.0008)		-0.0016* (0.0008)
ROA, %		-0.0003*** (0.0001)		-0.0003*** (0.0001)
Constant	0.0062*** (0.0014)	0.0025 (0.0137)	-0.0021 (0.0049)	0.0201 (0.0146)
Observations	18,854	18,854	18,854	18,854
R-squared	0.0158	0.1008	0.1088	0.1699
Data	Unbalanced	Unbalanced	Unbalanced	Unbalanced
Industry Dummy	No	No	Yes	Yes
Year Dummy	No	No	Yes	Yes

inclusion index leads to a 0.04% increase in the level of financialization of the firm. Age and total assets show a positive correlation with the level of financialization of the firm, with a coefficient at the 1% level. It is clear from the data in the table that the foreign = 1 dummy variable has a value of 0.96%, indicating that, in general, firms in other countries have a higher level of corporate financialization compared to Chinese firms. The debt and SOE = 1 dummy variables are negatively correlated with corporate financialization, indicating that corporate debt is negatively correlated with corporate financialization. From the estimation results, state-owned enterprises have a 0.3% lower

level of financialization than private enterprises, and foreign enterprises have a 0.96% higher level of financialization than other enterprises. Executive compensation and ROA (%) also show a negative relationship.

4.2 Heterogeneity Analysis

There are large differences in the financial environment of firms, and large heterogeneity in financial accessibility. Consider whether the development of financial digital inclusion has had a different impact on the financialization of firms of different sizes. Table 3, like the benchmark above, also uses four columns to reflect the different four scenarios, where (2) and (4) are the results after the inclusion of control variables. In the dummy in the table, it can be seen that firms with total assets of 1 in years above the 50th percentile are also considered to be large-scale firms, and conversely, 0 is considered to be an SME. The interaction term exhibits results that are significantly positive as can be seen in columns (1) and (2), indicating that the development of digital finance has had a greater impact on the financialization of larger firms. After adding the year dummy variable in columns (3) and (4), the interaction term is found to be no longer significant. This suggests that there is no heterogeneity in the impact of the development of digital finance on the financialization of firms in terms of firm size. From the above data, age, total assets, and foreign-owned firms show a positive correlation, while the others show a negative relationship.

Table 3. Heterogeneity analysis

VARIABLES	(1) OLS DoF	(2) OLS DoF	(3) OLS DoF	(4) OLS DoF
Aggregate Index	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0003*** (0.0000)	0.0004*** (0.0000)
Dummy	-0.1031*** (0.0178)	-0.1373*** (0.0182)	-0.0234 (0.0185)	-0.0274 (0.0187)
Dummy × Aggregate Index	0.0004*** (0.0001)	0.0005*** (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)
Constant	0.0066*** (0.0015)	-0.0071 (0.0139)	-0.0015 (0.0050)	0.0139 (0.0149)
Observations	18,854	18,854	18,854	18,854
R-squared	0.0170	0.1040	0.1088	0.1702
Data	Unbalanced	Unbalanced	Unbalanced	Unbalanced
Controls	No	Yes	No	Yes
Industry Dummy	No	No	Yes	Yes
Year Dummy	No	No	Yes	Yes

Table 4. Robustness test

VARIABLES	(1) Panel FE DoF	(2) Panel FE DoF	(3) Panel FE DoF	(4) Panel FE DoF
Aggregate Index	0.0002*** (0.0000)	0.0001*** (0.0000)	0.0004*** (0.0001)	0.0004*** (0.0001)
Constant	0.0047** (0.0018)	0.1141*** (0.0324)	-0.0160 (0.0121)	0.1035*** (0.0359)
Observations	13,344	13,344	13,344	13,344
Number of id	1,668	1,668	1,668	1,668
Data	Balanced	Balanced	Balanced	Balanced
Controls	No	Yes	No	Yes
Year Dummy	No	No	Yes	Yes

5 Robustness Test

In the robustness tests, which are estimated using mainly balanced panel data and panel FE. No other control variables are used in columns (1) and (3), instead, all control variables are used in columns (2) and (4), which means that the data in column 4 are full and there is variation in both year dummy and control variables. The first two columns contain time-fixed effects, while the last two columns contain time-varying effects. A one-unit change in the total index results in a 0.04% change in corporate financialization. As can be seen from the above description and data, the conclusions of this paper are robust (Table 4).

6 Conclusions

This paper examines the relationship between the development of digital finance and the degree of corporate financialization. The empirical results show that the development of digital finance promoted the financialization of enterprises. On average, an increase of 1 unit in the digital financial index will lead to an increase of 0.04% in the degree of financialization of enterprises. Heterogeneity analysis shows no scale effect in the impact of digital finance development on corporate financialization. Based on this, this paper suggests that deviating from the real to the virtual caused by over-financialization should be avoided in the digital era.

Firstly, the actual economy has always been the foundation of human survival and development and is fundamental to a country. In China, for example, with the rapid development of the virtual economy, which accounts for an increasingly high proportion of GDP, there has been a crowding-out effect on the real economy, and China has experienced a phenomenon of "de-realization to virtualization." The development of the virtual economy must be based on the real economy, and there is a positive correlation between the scale of its development and the real economy. Digital finance, as

a new model, breaks the monopoly of the traditional financial industry, gives full play to the competitive advantages of the market, promotes the healthy development of the real economy, and facilitates the development of the financialization of enterprises. In contrast, foreign enterprises are more effective in the financialization of enterprises than state-owned enterprises. The development of digital finance needs to be promoted and actively developed in all regions to increase the acceptance of digital finance by citizens of most ages and to provide robust market conditions for digital finance. At the same time, digital finance needs to stick to the real economy, improving the quality and speed of service to the people while making up for the traditional approach, providing assistance to small and medium-sized enterprises in terms of financing, and providing support for the healthy and orderly development of the real economy.

Secondly, under the social pressure of the overall economic downturn and overcapacity, the actual economy should seize the windfall of rapid development of digital finance and not continue to stagnate and work behind closed doors. We should promote the economic transformation and upgrading of enterprises, rely on existing valuable resources, improve business management, and enhance the core competitiveness and self-innovation ability of enterprises as a whole.

Finally, as a new thing, digital finance also has some drawbacks. Most digital finance relies on internet connectivity, fear of power and internet outages, regulatory oversight leading to confusion throughout the industry, and websites that are not physically protected like physical banks. There have been instances of people stealing individuals' online accounts through hacking or stealing passwords or login credentials. Therefore, while vigorously developing digital finance, the government needs to strengthen regulation, improve relevant laws and regulations, crack down on illegal financial activities, maintain order in the financial market, prevent and resolve financial risks, and provide a better- and better-quality market environment for digital finance.

References

1. Songqin. H. (2018). The research on financialization of China's entity enterprises and its effects: from empirical evidence of Chinese listed companies J. *Industrial Economics*, 10-12
2. Xunli, X., Yan, S., Haoxing, Z & Feng, G., 2018 Can digital finance promote entrepreneurship? – Evidence from China. J. *Economics (Quarterly)*, 2018, 17(3):1557-1580.
3. Yajun. B., 2010. Real Economy: the foundation and assurance of sustainable development of fictitious economy—probing into the relationship between fictitious economy and real economy. J. 2010(01):17-18
4. Yiping, H. & Zhuo. H., 2018. “The Development of Digital Finance in China: Present and Future.” *China Economic Quarterly* Vol. 17. No. 4
5. Zhijun, L. 2021.“Digital Finance and Financialization of Entity Enterprises”. J. *Zhejiang Finance*, 2021(01):56-57
6. Stulz, R.M. Optimal Hedging Policies. J. *Journal of Financial and Quantitative Analysis*, 1984, 19(2):127-140.
7. Hongqing, H., 2019. Digital Finance: An important driver of China's high quality economic development. J. *Journal of Xi'an university of Finance and Economics*, 2019. Vol. 31.02.
8. Zhangzhen, L., 2016. Commercial Banking Innovation in the Internet Financial Model. J. 2016. April:163-165

9. Yajuan, L., Dandan, M. & Shuou. W, 2018. Study on inclusive finance's impact on Chinese family income. *Exploring Financial Theory* 2018(02):27-28
10. Bang, L. & Jianhua, Z. (2019). Can the development of digital inclusive finance stimulate innovation? – Evidence from Chinese cities and *Mesoderm Economic Science* 2019 Vol. 41 No. 5 75-78
11. 12. Qiuzi. F. & Yiping, H., 2018. The Heterogeneous Impact of Digital Finance on Rural Financial Needs - Evidence from the China Household Finance Survey and Peking University Digital Inclusive Finance Index. *J. Financial research*, 2018, (01):68-84.
12. 13. Yanan, W., Xin, Y. & Lin, X., 2020. Can digital finance boost the real economy? *J. Financial Sciences*, 2020(03):1-13.
13. Yuchao. P., Xiaoran, Z. & Sichao. M., 2018. Corporate De-Realization and Financial Market Stability: A Perspective on the Risk of Stock Price Crashes [J]. *Economic Research*, 2018, 53(10):50-66.
14. Yiping, H. & Zhuo, H., 2018. Digital financial development in China: now and the future. *J. Economics (Quarterly)*, 2018, 17(4):1489-1502.
15. Dan, M., Dan. W. & Lin. S., 2021. Can Digital Inclusive Finance Improve the Financial Situation of “From Real to Virtual”——Spatial Durbin Model Analysis Based on Provincial Panel Data. *J. Hainan Finance*. Issue 4, 2021 67-78 of 12

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