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Can Fintech Reduce the Cost of Corporate Debt Financing?

-- Evidence from Chinese Listed Companies

Luyi Wang

Liaoning University, Shenyang, China

13188525600@163.com

Abstract. Amidst the wave of a new round of scientific and technological revolution, it has become an important strategic means for enterprises to accelerate the development of financial technology and promote the digital transformation of economic activities. This paper empirically examines the impact and mechanism of the listed companies' use of fintech on their own debt financing costs, and concludes that the development of fintech can significantly reduce the cost of corporate debt financing, and the lower the degree of information asymmetry between enterprises and financial institutions, the lower the concentration of supply chain, the more significant the effect of fintech on reducing the cost of corporate debt financing. This paper brings fintech and corporate debt financing cost into the same analytical framework, expands existing research, and puts forward corresponding suggestions and prospects.

Keywords: Fintech; Cost of Debt Financing; Supply Chain Concentration; Information Asymmetry Degree; Cost of Equity Capital.

1. Introduction

Financial Technology, abbreviated as "Fintech", is the combination of financial services and information technology, including cloud computing, Internet finance, artificial intelligence, digital currency, data visualization, etc., aiming to improve and automate the service and management of traditional finance and investment industries through innovative technologies. Fintech has been widely recognized globally for its contribution to improving efficiency, enhancing accessibility, improving user experience and promoting financial inclusion.

Possible marginal contributions of this paper lie in the following. Firstly, the method of "extracting keywords related to fintech + the number of Baidu news searches" (Li Chuntao et al., 2020)[1] is adopted to measure regional fintech indicators, and then the influence of fintech on corporate debt financing costs is deeply studied, which enriches the research results on the role of fintech on the corporate level. Second, this paper uses the data of A-share listed companies in Shanghai and Shenzhen from 2009 to 2022 to prove the relationship between fintech and corporate debt financing cost, and studies the influence direction of information asymmetry and supply chain concentration on corporate debt financing cost. This paper studies the heterogeneity of the impact of fintech on corporate debt financing costs from two aspects of firm nature and region, which enriches the existing research results.

2. Theoretical Mechanisms and Research Hypotheses

2.1. Direct Effects

(1) Research on Fintech

Tang Song et al. (2022)[2] pointed out that fintech can reduce the financing constraints and financial costs of enterprises, and promote the digital transformation of enterprises. Some studies have pointed out that fintech can improve the cost efficiency of banks (Lee et.al 2021)[3].

(2) Research on the cost of debt financing

Ruan Jian, Shen Yao and Fan Zhongbao (2020)[4] pointed out that fintech can reduce the cost of corporate debt financing by reducing the leverage ratio of enterprises. Political connections can also

alleviate the problem of corporate financing constraints (Yu Wei, Wang Miajun and Jin Xiangrong, 2021)[5].

(3) Research on Fintech and debt financing cost

Fintech can provide technical support for improving operational efficiency and reduce financing costs by increasing the speed of credit approval. Fuster et al. (2019)[6] found a 20% increase in loan approval speed when using fintech.

Fintech can promote the popularization of external financing and lower the credit threshold of enterprises (Li Chuntao et al., 2020)[1]. On the other hand, banks occupy the market mainly by lowering the lending rate, which reduces the cost of enterprises in the borrowing process. With this in mind, we propose Hypothesis 1:

Hypothesis 1: Ceteris paribus, the rapid development of fintech can significantly reduce the cost of debt financing for enterprises.

2.2. Indirect Effects

2.2.1. Financial Technology, Information Asymmetry and Debt Financing Cost

Financial institutions can use the means of big data to dig out more information based on the traditional financial information provided by enterprises. Therefore, fintech provides a powerful tool for the full disclosure of information, and alleviates the financing constraints of enterprises by alleviating the problem of information asymmetry between enterprises and banks. Based on this, we propose Hypothesis 2:

Hypothesis 2: Ceteris paribus, the lower the degree of information asymmetry between enterprises and financial institutions, the more significant the effect of fintech on reducing the cost of corporate debt financing.

2.2.2. Fintech, Supply Chain Concentration and Debt Financing Cost

The high concentration of supply chain will bring adverse effects to enterprises. For example, the high concentration of supply chain will increase the operating cost of enterprises (Zou Meifeng and Zhang Xindong, 2020)[7].

The rapid development of fintech has given rise to many digital supply chain finance platforms, which make it easier for smes to access capital by providing simplified and automated supply chain financing services, such as invoice discounting and supply chain financing. This helps these enterprises to expand their production capacity and become new supply chain participants, which in turn reduces the concentration of the whole supply chain. Therefore, we propose Hypothesis 3:

Hypothesis 3: Ceteris paribus, the lower the concentration of supply chain, the more significant the effect of fintech on reducing the cost of corporate debt financing.

3. Data Sources, Research Design, and Indicator Construction

3.1. Data Source

This paper takes the Shanghai and Shenzhen A-share listed companies of China from 2010 to 2021 as the research object, and removes the samples of ST, *ST and delisted companies during the period. The patent data of listed enterprises comes from the patent database of Baiteng.com. The development degree of financial technology at the level of prefectual-level cities or municipalities comes from the number of results of relevant keywords in Baidu News Advanced search. The data of regional financial development level comes from the data of commercial bank branches published by the China Banking Regulatory Commission. Corporate financial data, data related to the board of directors and research and development data are from the CSMAR database and WIND database. In

order to eliminate the influence of extreme values, the continuous variables are also tail-shrunk by 1% above and below.

3.2. Indicator Construction

3.2.1. Dependent Variable

Cost of debt financing (COST), this paper adopts the method of Zheng Jun et al. (2013)[9] to measure the cost of debt financing by the method of (interest expense + handling fee expense + other financial expense)/total liabilities at the end of the period in the next year. In the robustness test part, this paper draws on the practice of Pan Yue et al. (2013)[10] and uses the method of financial expenses/total liabilities to measure the cost of debt financing (COST1) as an alternative variable for analysis.

3.2.2. Independent Variable

Financial technology (Fintech), this paper learns from the practice of Li Chuntao et al. (2020)[1], extracts keywords related to fintech from Baidu News, including 48 keywords such as big data, blockchain, business intelligence and smart financial contract, and matches them with 300 prefecture-level cities or municipalities directly under the Central Government in China to obtain the total search volume of fintech-related keywords in the same city. The index is logarithmic transformed to measure the level of financial technology development at the municipal level.

3.2.3. Control Variables

In order to improve the credibility of the research, this paper refers to the practice of Song Min et al. (2021)[11] and Li Chuntao et al. (2020)[1], and adds a series of control variables. It includes asset liability ratio (Leverage), company Size (Size), profit margin on total assets (ROA), Growth rate of operating income (Growth), proportion of independent directors (Indep), book-to-market ratio (Marketratio), ownership concentration (Top1), board size (Boardsize) and assets Tabgibility, CashFlow ratio, and Age of the enterprise, the meanings and measurement methods of the control variables are presented in Table 1.

3.3. Model Design

Table 1. Symbols and Definitions of Control Variables

Variable Name	Symbol	Definition
Cost of debt financing	COST	See (II) Variable description for details
Financial technology	Fintech	See (II) Variable description for details
Asset-liability ratio	Leverage	Total liabilities/total assets
Size of company	Size	Natural log of total assets at the end of the year
Return on total assets	ROA	Net profit/average balance of total assets
Revenue growth Rate	Growth	Operating income amount in current period - in the same period last year)/(in the same period last year)
Proportion of independent directors	Indep	The ratio of the number of independent directors to the size of directors
Book-to-market ratio	Marketratio	Total assets/Total market value
Concentration of ownership	Top1	Shareholding ratio of the largest shareholder (%)
Board size	Boardsize	Number of Board Directors
Tangibility of assets	Tabgibility	Total tangible assets/total assets
Cash flow ratio	CashFlow	Net cash flow from operating activities/Total current liabilities
Age of enterprise	Age	The logarithm of current year minus year company went public

In order to study the impact of fintech on corporate debt financing cost, this paper sets the following benchmark regression model:

$$ESG_{i,t} = \beta_0 + \beta_1 Fintech_{i,t-1} + \Sigma_j \beta_j Controls_{i,t-1} + \lambda_{i,t-1} + \mu_{i,t-1} + \varepsilon_{i,t-1} \quad (1)$$

Here, the explained variable debt financing cost (COST), the core explanatory variable is Fintech, Controls is the aforementioned control variable, λ_i is the industry fixed effect, μ_t is the time fixed effect, and $\varepsilon_{i,t-1}$ is the random error term in the benchmark model. The parameter β_1 reflects the impact of fintech on the cost of debt financing. In order to make the statistical inference results more robust, this paper uses the robust standard error to estimate the regression model. For ease of observation, the COST value is expanded by a factor of 100 for regression analysis.

4. Empirical Analysis

4.1. Descriptive Statistics

Table 2 shows the descriptive statistics of this paper. The mean value of explained variable COST of debt financing is 0.019, the standard deviation is 0.015, the minimum value is 0, the maximum value is 0.064, and the maximum value is 0.065, indicating that the data distribution is skewed to the left, and most of the data values are concentrated around the maximum value, indicating that most enterprises' cost of debt financing is maintained at a high level. A few enterprises have debt financing costs too low. The mean value of the core explanatory variable financial technology (Fintech) is 4.615, the minimum value is 0.693, and the maximum value is 7.491, which also indicates that the level of financial technology in the regions where most enterprises are located is maintained at a high level, and the level of financial technology in the regions where a few enterprises are located is too low.

Table 2. Descriptive Statistics Results

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	N	mean	sd	min	max	median
Fintech	21053	4.615	1.652	0.693	7.491	7.491
COST	21053	0.019	0.015	0.000	0.064	0.064
Leverage	21053	0.417	0.209	0.049	0.896	0.334
AssetSize	21053	22.330	1.314	19.860	26.380	0.896
ROA	21053	0.044	0.065	-0.238	0.223	26.380
Growth	21053	0.181	0.402	-0.569	2.499	0.223
Indep	21053	37.586	5.346	33.330	57.140	2.499
Marketratio	21053	0.615	0.247	0.113	1.164	57.140
Top1	21053	34.482	14.935	8.720	74.300	1.164
Boardsize	21053	8.539	1.692	5.000	15.000	74.300
Tabgibility	21053	0.927	0.090	0.523	1.000	15.000
CashFlow	21053	0.231	0.408	-0.641	2.119	1.000
Age	21053	2.017	0.941	0.000	3.434	2.119

4.2. Baseline Regression

Column (1) of Table 3 shows the regression results with only the core explanatory variable fintech added. The results all show that fintech has a negative inhibitory effect on debt financing cost at the significance level of 1%. Column (2) of Table 3 shows the regression results with the addition of control variables. The results also show that fintech has a negative inhibitory effect on debt financing

cost at the significance level of 1%, that is, enterprises can reduce their debt financing cost by using fintech. This is mainly due to the fact that fintech can reduce the cost of debt financing by reducing the degree of information asymmetry between banks and enterprises, and Hypothesis 1 holds.

Table 3. Baseline Regression

	$COST_t$	$COST_t$
$Fintech_{t-1}$	-0.00152***	-0.000988***
	(-13.04)	(-8.43)
$Leverage_{t-1}$		0.0266***
		(39.66)
$AssetSize_{t-1}$		-0.000205*
		(-1.85)
ROA_{t-1}		-0.0368***
		(-17.55)
$Growth_{t-1}$		-0.000476*
		(-1.89)
$Indep_{t-1}$		0.0000270
		(1.46)
$Merge_{t-1}$		0.000694***
		(3.22)
$Marketratio_{t-1}$		0.00427***
		(7.84)
$Top1_{t-1}$		-0.0000861***
		(-13.34)
$Boardsize_{t-1}$		-0.000132**
		(-2.12)
$Tabgibility_{t-1}$		-0.0201***
		(-18.82)
$CashFlow_{t-1}$		-0.000289
		(-0.98)
Age_{t-1}		-0.000637***
		(-4.72)
Year FE	YES	YES
Industry FE	YES	YES
_cons	0.0201***	0.0379***
	(20.54)	(14.78)
N	21053	21053

Note: ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are shown in parentheses (the same applies to the following table).

4.3. Robustness Analysis

4.3.1. Replacement of Explanatory Variables

Learn from the practice of Song Min et al. (2021)[11], search keywords such as "fintech cloud computing", "big data", "blockchain" on the "Tianyan Cha" website, and delete companies that have been operating for less than one year or in an abnormal state of business. At the same time, the use of regular expressions to "finance" "insurance" "credit" "clearing" "payment" and other finance-related keywords in the company's business scope for fuzzy matching. the annual number of fintech companies in prefect-level cities and logarithmic processing is done, which is used as an indicator to measure the development level of regional fintech. The larger the value is, the higher the development level of fintech is. The test results are shown in Table 4, proving the robustness of the core conclusions.

Table 4. Robustness Analysis --Replacement of Explanatory Variables

	$COST_t$	$COST_t$
$FintechN_{t-1}$	-0.0655***	-0.0417***
	(-13.29)	(-8.49)
Year FE	YES	YES
Industry FE	YES	YES
_cons	1.861***	3.705***
	(19.66)	(14.55)
N	21053	21053

4.4. Heterogeneity Analysis

This paper carries out grouped regressions for whether the enterprise is state-owned and whether it is high-tech. The regression results of whether it is a state-owned enterprise are shown in column (1) and column (2) of Table 5. The results show that fintech has a significant inhibitory effect on the debt financing cost of both state-owned and non-state-owned enterprises, but compared with state-owned enterprises.

The regression results of high-tech enterprises or not are shown in columns (3) and (4) of Table 5. The results show that fintech has a significant inhibitory effect on the debt financing cost of both high-tech and non-high-tech enterprises, but compared with non-high-tech enterprises, fintech has a greater inhibitory effect on the debt financing cost of non-high-tech enterprises.

Table 5. Heterogeneity Analysis

	(1)	(2)	(3)	(4)
	Non-state owned $COST_t$	State owned $COST_t$	Non- high-tech $COST_t$	high-tech $COST_t$
$Fintech_{t-1}$	-0.119***	-0.0682***	-0.0752***	-0.130***
	(-7.41)	(-3.92)	(-5.42)	(-6.02)
Year	YES	YES	YES	YES
Industry	YES	YES	YES	YES
_cons	2.917***	2.761***	3.703***	3.825***
	(6.99)	(7.77)	(13.15)	(7.70)
N	11551	8981	15416	5048

5. Mechanism Testing

5.1. Financial Technology, the Degree of Information Asymmetry and the Cost of Corporate Debt Financing

The regression results are shown in Table 9. In column (1) of Table 6, the coefficient of fintech is significantly negative, indicating that fintech significantly reduces the cost of debt financing. At the same time, the coefficient of the interaction term between fintech and information asymmetry is significantly negative, indicating that the lower the degree of information asymmetry between enterprises and financial institutions, the more significant the effect of fintech on reducing the cost of debt financing of enterprises. Hypothesis 2 is verified.

5.2. Financial Technology, Supply Chain Concentration and Corporate Debt Financing Costs

In column (2) of Table 6, fintech is significantly negative, and the coefficient of supply chain concentration is significantly positive, indicating that the lower the concentration of supply chain, the lower the debt financing cost of enterprises, and Hypothesis 3 is verified.

Table 6. Mechanism Testing

	(1)	(2)
	$COST_t$	$COST_t$
$Fintech_{t-1}$	-0.108***	-0.122***
	(-8.64)	(-7.93)
$Fintech \times SC\ Concentration_{t-1}$		0.000720**
		(1.99)
$SC\ Concentration_{t-1}$		0.00564***
		(3.13)
$Fintech \times Asymmetric\ Inform_{t-1}$	-0.0278**	
	(-2.00)	
$Asymmetric\ Inform_{t-1}$	0.00834	
	(0.10)	
Year	YES	YES
Industry	YES	YES
_cons	4.577***	3.451***
	(13.37)	(12.94)
N	21078	20227

6. Conclusion and Implications

This paper selected Chinese A-share listed companies in Shanghai and Shenzhen from 2010 to 2021 as the research object, and empirically tested the impact of fintech on corporate debt financing costs. The empirical results show that: firstly, fintech can significantly reduce the debt financing cost of enterprises, and this conclusion is still robust and reliable after passing robustness test and heterogeneity test. Secondly, the lower the degree of information asymmetry between enterprises and financial institutions, the more significant the effect of fintech on reducing the cost of corporate debt financing. Third, the lower the concentration of the supply chain, the more significant the effect of fintech on reducing the cost of corporate debt financing.

Based on the above research conclusions, this paper makes the following recommendations:

At the macro level, the government should formulate and implement policies to support fintech innovation and development to encourage fintech enterprises to develop new financial products and services.

At the micro level, enterprises should actively explore and adopt financial technology tools and platforms to improve financing efficiency and reduce financing costs. Financial institutions strengthen the use of big data analytics and artificial intelligence technology to optimize financial decision-making and risk management, improve the accuracy of credit evaluation, reduce default risk, and thus reduce debt financing costs.

References

[1] Li Chuntao, Yan Xuwen, Song Min et al. Financial innovation, technology and enterprises new three board listed company evidence. China industrial economy, 2020, (01), 81-98.

[2] Tang Song, Su Xuesha, Zhao Dannii. Financial technology and Enterprise digital transformation: Based on the perspective of enterprise life cycle. Financial Science and Technology, 2022(02), 17-32.

[3] Lee, H. H., S. A. Yang, and K. Kim. The Role of Fintech in Mitigating Information Friction in Supply Chain Finance. Asian Development Bank Economics Working Paper, 2019.

[4] Ruan Jian, Shen Yao, Fan Zhongbao. How to Drive the Cost Reduction of Corporate Debt Financing: Utility Identification, Heterogeneity Characteristics and Mechanism Test Based on Digital Finance. Research of Financial Economics, 2020(01), 32-44.

[5] Yu Wei, Wang Miaojun, Jin Xiangrong. Political connection and financing constraint: information effect and resource effect. Economic Research, 2012(09), 125-139.

[6] Fuster, A., M. Plosser, P. Schnabl, and J. Vickery. The Role of Technology in Mortgage Lending. Review of Financial Studies, 2019(5), 1854-1899.

[7] Zou Meifeng, Zhang Xindong. Does supplier concentration affect firm innovation?. Investment Research, 2020(12), 44-63.

[8] Zhang Yong. Financial development, concentration of supply chain and corporate debt financing costs. Journal of financial BBS, 2017(4), 54-67.

[9] Zheng Jun, Lin Zhonggao, Peng Lin. Monetary policy, Internal control quality and debt financing cost. Contemporary Finance and Economics, 2013(09), 118-129.

[10] Pan Yue, Wang Yuguang, Dai Yiyi. Relationship between government and enterprises, and tax collection and management and debt financing of listed companies. China industrial economy, 2013(8), 109-121.

[11] Song Min, Zhou Peng, Si Haitao. Financial technology and Enterprise total factor productivity: The Perspective of "empowerment" and credit rationing. China's industrial economy, 2021(4), 138-155.

[12] Patatoukas, P.N. Customer-base Concentration: Implications for Firm Performance and Capital Markets. The Accounting Review, 2012(2), 363-392.

[13] Zhu Jian, Fang Junxiong. Chinese style margin trading system arrangement and stock price crash risk deterioration. Economic Research, 2016(05), 143-158.

[14] Fang Hongxing, Zhang Yong. Supplier/customer relationship transactions, earnings management and auditor decision-making. Accounting Research, 2016(01),79-86+96.