



Fintech and Excess Commercial Credit Supply

-- A Credit-Based Perspective

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Abstract. Commercial credit supply mainly includes the operational attribute part of normal business operation and the financial attribute part of providing financial services to upstream and downstream small and medium-sized enterprises (SMEs), and the focus of this paper is on the excess commercial credit supply as a financial attribute. This paper utilizes the data of non-financial listed companies from 2013-2019 to study the impact of fintech on the excess commercial credit supply of listed companies and its mechanism of action in the two paths of fintech credit and traditional credit from the credit perspective. The study finds that in the credit perspective, the development of fintech generally reduces the supply of excess commercial banks of listed companies. Among them, traditional credit combined with fintech means reduces the supply of listed companies' excess commercial credit, while the expansion of fintech credit scale increases the supply of excess commercial credit. The mechanism test shows that FinTech credit can reduce the supply of excess commercial credit of listed firms by alleviating the financing constraints of SMEs.

Keywords: Fintech credit; Traditional credit; Excess commercial credit; Financing constraints

1 Introduction

From the perspective of supply and demand, there are two main theories about commercial credit, namely, the alternative financing theory and the buyer's market theory. Alternative financing theory holds that demand-oriented commercial credit has become an important alternative financing method to bank loans^[1,2]. The buyer's market theory holds that suppliers are willing to provide customers with a large amount of commercial credit because of their information advantage, and if the actual commercial credit exceeds the financing demand, there will be an excess supply of commercial credit^[3].

Traditional credit and commercial credit are inextricably linked: for enterprises as borrowers, they are substitutes; for enterprises as lenders, they are complements. Today's deep coupling of finance and technology has had a non-negligible impact on the real economy, as well as on traditional credit and commercial credit. First, the development of financial technology will intensify the traditional banking competition^[4], which in turn affects the traditional credit^[5]. Secondly, the development of fintech will

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also affect the lending behavior between enterprises while affecting traditional credit^[6]. Third, as one of the innovative manifestations of FinTech, FinTech credit has gradually gained attention in recent years, which includes all credit behaviors facilitated by electronic (online) platforms operated by non-commercial banks^[7 8 9 10].

However, there are still some shortcomings in the existing research: (1) Few literatures link fintech and excess commercial credit, but the supply of excess commercial credit reflects the degree of financialization of enterprises to a certain extent, and the study of how fintech affects the supply of excess commercial credit can provide strong support for the study of how to alleviate the problems of shadow banking and financialization of real enterprises and assist the economy to move away from emptiness to reality in today's background of high-quality development of the economy. de-virtualization to the real world to provide strong support. (2) Research on fintech credit is mainly theoretical analysis, and empirical analysis is even less common. (3) Most of the empirical literature adopts the Peking University Financial Inclusion Index or the financial technology indexes constructed by major institutions as variables, which has certain subjectivity and limitations.

The innovation of this paper mainly lies in (1) linking fintech credit, bank credit and commercial credit, analyzing the impact of fintech on the supply of excess commercial credit, and enriching the study of fintech credit. (2) The measurement of fintech credit scale adds the scale of big tech credit on the basis of the total scale of fintech credit in China published by CCAF, and the data measurement is more comprehensive.

2 Theoretical Hypothesis and Issues Raised

With the development and deepening of the coupling of finance and science and technology, the inclusive character of finance has gradually come to the fore, in which the most prominent contribution of financial technology in credit is financial technology credit^[11 12]. With regard to the definition of fintech credit, there is no uniform definition in the academic world, but one of the more authoritative is the Bank for International Settlements: the Bank for International Settlements believes that broadly speaking, fintech credit includes all credit behaviors facilitated by electronic (online) platforms operated by non-commercial banks^[13 14]. Therefore, the study of FinTech credit in this paper is also based on this definition. This paper analyzes FinTech and excess commercial credit from a credit perspective in three paths:

2.1 Path 1

Entity-listed enterprises combined with technological means (such as building their own online platform) to issue fintech loans, i.e., the large technology credit business model, which has increased its own supply of excess commercial credit^[18 19].

In the past 10 years, the development of digital finance, especially the credit of large technology companies (referred to as large technology credit), let us see the dawn of a real solution to the problem of small and medium-sized enterprises, especially small and micro-enterprises, "difficult to finance". More and more technology companies and

real enterprises to build their own platform, large technology credit business model has been implemented, and its rapid development has undoubtedly broadened the supply channels of excess commercial credit, resulting in an increase in the supply of excess commercial credit^[20].

2.2 Path 2

Fintech credit eases financing constraints by granting loans to SMEs and reduces the demand for excess commercial credit, which in turn reduces the supply of excess commercial supply for real enterprises with lower degrees of financing constraints^[3].

As mentioned earlier, the main reason why big tech credit can spread with the momentum of a starburst lies in the creative formation of a proven credit risk management framework, which solves the most important pain point of financial inclusion, namely, how to reduce the degree of information asymmetry in the management of financing for small and micro enterprises. Fintech lending, consisting of Big Tech Credit and other online lending channels, is able to break this impasse by innovating credit risk management with the help of digital technology tools.

2.3 Path 3

Traditional financial institutions that issue traditional credit reduce the degree of information asymmetry with enterprises by combining technological means^[15 11](e.g., cooperation with technology companies, online banking, etc.), increasing the number of loans issued to SMEs, easing SME financing constraints, and thus reducing the supply of excess commercial credit to enterprises with lower financing constraints^[5].

According to paths 1, 2, and 3, since the total effect of FinTech credit on excess commercial credit has not been concluded, and how the total effect of FinTech development re-credit perspective on excess commercial credit is also to be empirically examined, it is proposed:

Question 1: Is the total effect of FinTech credit on the supply of excess credit to listed firms an increase or a decrease?

Question 2: Is the total effect of FinTech credit versus traditional credit on the supply of excess commercial credit to listed firms increasing or decreasing?

Hypothesis: FinTech credit can reduce the excess commercial credit supply of listed firms by alleviating the financing constraints of SMEs.

3 Data and Methodology

3.1 Propensity Score Matching

This paper takes China's A-share listed companies excluding ST, financial industry (SEC 2012 edition industry classification) from 2013-2019 as the research object. This paper follows the following process for sample screening: exclude ST, financial industry samples; exclude missing data samples; and perform 1% shrinkage before and after

for continuous variables, which results in a total of 15,566 observation samples. Data are obtained from the wind database and CSMAR.

3.2 Model Construction and Variable Selection

$$LNRES_{i,t} = \beta_0 + \beta_1 LNFINCREDIT_{i,t} + \beta_2 LNBANK_{i,t} + \sum CONTROLS_{i,t} + \varepsilon_{i,t} \quad (1)$$

In the regression, LNRES stands for excess commercial credit, LNFINCREDIT stands for the logarithm of fintech credit size, LNBANK stands for the logarithm of traditional credit size, and CONTROLS stands for control variables.

(1) Explained variable: LNRES excess commercial credit

For the excess commercial credit, referring to the construction method of investment efficiency variables^[16 17], this paper adopts the following model to obtain the residual RES as the measurement variable of excess commercial credit:

$$TC = \beta_0 + \beta_1 TOBINQ + \beta_2 LEV + \beta_3 ROA + \beta_4 GROW + \beta_5 TOP1 + \sum YEAR + \sum INDUSTRY + \varepsilon \quad (2)$$

TC is commercial credit, and its measurement draws on the definition of commercial credit by Chen Shenglan and Liu Xiaoling, which is calculated by the following formula: commercial credit = (accounts receivable + notes receivable + prepayment)/operating cost. TOP1 is the proportion of shares held by the firm's first largest shareholder.

(2) Explanatory variables: logarithmic value of fintech credit per capita for LNFINCREDIT; logarithmic value of traditional credit per capita for LNBANK

The source of fintech credit data is the dataset of BIS working paper "Fintech and big tech credit: a new database"^[1]. This paper adopts the total size of Fintech credit (USD mn) and Big tech credit (USD mn) in this dataset to represent the total size of Fintech credit in China.

The source of traditional credit data is the official website of the People's Bank of China, and the total of all loans from depository and non-depository financial institutions is used to represent the size of traditional credit.

(3) Mediating variable: the SA financing constraint index. This part takes listed companies in other sectors other than the main board of A-share as the research object of SMEs.

(4) Control variables: return on total assets (ROA), gearing ratio (LEV), firm growth (GROW), percentage of independent directors (INDIR), nature of ownership (SOE), Tobin's Q value (TOBINQ), as well as industry, year and province fixed effects.

4 Empirical Results

4.1 Basic Test Results

Table 1 presents the results of the correlation test between fintech credit and traditional credit on excess business credit. All regressions control for year, industry and province fixed effects.

Table 1. Basic test results

	(1)	(2)	(3)	(4)
	lnres	lnres	lnres	lnres
Infincredit	0.0785*** (0.00208)	0.0697*** (0.00140)	0.183*** (0.0111)	0.178*** (0.00742)
Inbank			-0.709*** (0.0797)	-0.733*** (0.0534)
ROA		-0.922*** (0.008680029)		-0.922*** (0.00868)
LEV		-0.862*** (0.00768)		-0.862*** (0.00768)
GROW		2.78e-05*** (3.77e-06)		2.78e-05*** (3.77e-06)
INDIR		-0.123*** (0.0220)		-0.123*** (0.0220)
SOE		-0.0856*** (0.00375)		-0.0856*** (0.00375)
TOBINQ		0.0231*** (0.000455)		0.0231*** (0.000455)
Constant	-1.323*** (0.0108)	-0.921*** (0.0119)		9.005*** (0.722)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
province	Yes	Yes	Yes	Yes
Observations	15,566	15,566	15,566	15,566
R-squared	0.675	0.854	0.675	0.854

Note: Standard errors in parentheses. *p < 0.1, **p < 0.05, ***p < 0.01.

(1) and (2) present the results of the regressions of fintech credit on excess commercial credit. It can be seen that the regression coefficients of fintech credit are significantly positive before and after adding control variables, indicating that the total effect of fintech credit on the supply of excess commercial credit is increased, so it can be answered question 1: the total effect of fintech credit on the supply of excess credit to listed companies is increased. This indicates that the increase in the supply of excess commercial credit by listed enterprises through the issuance of FinTech credit is greater than the decrease in the supply of excess commercial credit due to the reduction in the financing constraints of SMEs, i.e., the development of FinTech credit has increased the supply of excess commercial credit to listed enterprises.

(3) (4) show the regression results of fintech credit, traditional credit and excess commercial credit. It can be seen that before and after adding control variables, the regression coefficients of fintech credit are significantly positive, the regression coefficients of traditional credit are significantly negative, and the absolute value of the regression coefficients of fintech credit is smaller than the absolute value of the regression coefficients of traditional credit, which indicates that: firstly, the traditional credit, after combining with scientific and technological means, has a negative effect on the supply of excess commercial credit, i.e., it can effectively reduce the supply of excess commercial credit; secondly, after adding the explanatory variables of the explanatory

variables of traditional credit, the positive effect of fintech credit on excess commercial credit is not affected, which provides support for the answer to question 1; third, in the credit perspective, the total effect of the development of fintech on excess commercial credit is negative, i.e., the development of fintech reduces the supply of excess commercial credit. Therefore, question 2 can be answered: the total effect of FinTech credit and traditional credit on the supply of excess commercial credit to listed firms is reduced, i.e., in the credit perspective, the development of FinTech reduces the supply of excess commercial banks.

Table 2. Mechanism test and robustness test results

	(1) SA	(2) SA	(3) Intc	(4) Intc
Infincredit	-0.0500*** (0.00162)	-0.0511*** (0.00168)	0.181*** (0.0497)	0.160*** (0.0479)
Inbank			-0.714** (0.358)	-0.731** (0.345)
ROA		-0.0527*** (0.0204)		-0.686*** (0.0560)
LEV		-0.0309** (0.0131)		-0.567*** (0.0496)
GROW		0.00268*** (0.000835)		2.58e-05 (2.43e-05)
INDIR		0.0221 (0.0292)		0.0966 (0.142)
SOE		-0.0455*** (0.00746)		-0.674*** (0.0242)
TOBINQ		0.0130*** (0.00155)		0.0215*** (0.00294)
Constant	-3.634*** (0.00845)	-3.668*** (0.0158)	8.698* (4.835)	9.415** (4.660)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
province	Yes	Yes	Yes	Yes
Observations	9,322	8,165	15,566	15,566
R-squared	0.155	0.179	0.112	0.177

Note: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

4.2 Mechanism Tests

Table 2 presents the basic results of the mechanism test and controls for year, industry and province fixed effects at the same time. According to the test results in (1) and (2), it can be seen that the regression coefficients of FinTech credit are significantly negative before and after adding control variables, indicating that FinTech credit can significantly alleviate SME financing constraints. Therefore, the hypothesis proposed in this paper is verified: fintech credit can reduce the excess commercial credit supply of listed enterprises by alleviating the financing constraints of SMEs.

4.3 Robustness Test

This paper conducts a robustness test of the basic regression results of the previous paper by replacing the explanatory variable excess commercial credit LNRES with the logarithmic value of commercial credit LNTC, and the regression results are shown in Table 2 (3) (4), and the corresponding regression results remain robust.

5 Conclusions and Policy Recommendations

5.1 Conclusion

This paper utilizes the data of China's A-share non-financial listed companies from 2013-2019 to explore the impact of fintech development on the supply of excess commercial credit of listed companies and its mechanism of action. It is found that in the credit perspective, the development of fintech generally reduces the supply of excess commercial credit of listed companies. Among them, the development of FinTech on traditional credit reduces the supply of excess commercial credit of listed companies, while the expansion of FinTech credit scale increases the supply of excess commercial credit. The mechanism test shows that FinTech credit can reduce the supply of excess commercial credit of listed enterprises by alleviating the financing constraints of SMEs.

5.2 Policy Recommendations

Based on the above conclusions, this paper puts forward several policy recommendations: first, while accelerating the development of FinTech, it is also necessary to make reasonable and appropriate use of it and give full play to its positive effect on the commercial credit market. Second, for policy makers, it is important to maintain long-term policy consistency as much as possible, so as to ensure the long-term sustainable development of the economy. Third, give full play to the positive role of fintech in easing the financing constraints of SMEs.

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