The Impact of Digital Inclusive Finance on the Operating Performance of Commercial Banks and Its Mechanism Analysis

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Abstract: The rapid development of digital inclusive finance has produced a series of impacts on traditional financial sectors such as commercial banks. This paper mainly analyzes the influence of digital inclusive finance on the operating performance of Chinese commercial banks from the two perspectives of bank competition and risk bearing. In this paper, 115 commercial banks in China are selected as samples for empirical analysis based on their panel data from 2011 to 2021. Firstly, the fixed-effect model estimation method is adopted to find that the promotion of digital inclusive finance has a significant adverse impact on the business performance of commercial banks. Secondly, this paper takes bank competition and risk taking as intermediary variables and uses the intermediary effect model to conduct an empirical analysis. The empirical results show that the de development of digital inclusive finance will promote the competition of commercial banks and improve the risks of commercial banks, thus reducing the operating performance of commercial banks. Therefore, Chinese commercial banks should change their business strategies, pay attention to risk prevention and control, and poll icy authorities should pay attention to the degree of competition of commercial banks to prevent excessive competition.

Key words: digital financial inclusion; commercial banks; business performance; bank competition; risk-taking

1 Introduction

In recent years, the development of China's inclusive finance has achieved remarkable results, and many phased results have been achieved. In 2016, the concept of " digital financial inclusion " was first proposed. As a commercial bank with great influence, while fulfilling its traditional financial service functions, it pays more attention to promoting digital transformation to meet the needs of consumers, and grasps the country's economic strategy to promote the country's economic growth. Especially in recent years, with the rapid development of digital technology, banks are gradually transforming to digital. In order to adapt to the times, commercial banks have changed their business development models and actively developed digital inclusive finance. However, with the rapid development of digital inclusive finance, the competition form of commercial banks has changed a lot, and even their business models have changed, which has brought great challenges to the development of my country's commercial banks. When it comes to consumers and small, medium and micro enterprises, digital financial inclusion has more advantages [1] .digital inclusive finance has

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successfully broken through a series of space and time constraints of traditional banking business, leading to a complex competitive landscape in China's banking industry.

As the most central role in the financial system, the performance of commercial banks plays a vital role in the stability of my country's financial industry and the development of the real economy. What impact does the rapid development of digital financial inclusion have on the operating performance of commercial banks ? Discussing this issue has important practical significance. This paper uses a sample of 115 commercial banks from 2011 to 2021 to deeply discuss how digital inclusive finance affects commercial bank performance, and through the intermediary effect model, discusses specific mechanism of influence.

2 Literature review and research hypothesis

2.1 Digital Inclusive Finance and Business Performance of Commercial Banks

There are many factors that affect the performance of commercial banks. From the perspective of its own factors, the existing literature mainly studies from the perspectives of non-interest income[2][3] , income structure diversification, loan diversification[4] and equity structure[5] . From the perspective of external factors, scholars have studied the impact of green credit[6][7] , financial technology [8][9] and regulatory constraints [10] on the operating performance of commercial banks. With the continuous promotion of digital finance, it has not only greatly improved the quality of financial services[11] , but also expanded the coverage of inclusiveness. Digital inclusive finance is the new direction of inclusive finance [12]. However, while digital finance utilizes digital technology to achieve disintermediation, it also has a negative impact on the deposit and loan activities of traditional commercial banks [13] . With the continuous popularization of digital finance, it has brought adverse effects on the operation of commercial banks [14] .Commercial banks usually have inclusive businesses such as special and poverty alleviation loans, which require higher costs, resulting in a decline in their profits [15] .

Hypothesis 1: The development of digital financial inclusion will lead to a decline in the operating performance of commercial banks.

2.2 Mechanism analysis

Most scholars believe that the development of digital financial inclusion will increase the degree of competition among commercial banks [16] . Digital inclusive finance can improve the competition of commercial banks by promoting the development of urban finance[17] . The development of digital financial inclusion increases the competition of commercial banks by reducing the concentration of the banking industry [18] . The rapid development of digital inclusive finance has had a huge impact on the liability, asset and mid-end businesses of traditional commercial banks , thus changing the competitive landscape of the traditional banking industry[19] .Most studies believe that bank competition will reduce the profit margin of commercial banks[20] , thereby reducing the bank's operating performance.

Hypothesis 2: The development of digital financial inclusion affects the performance of commercial banks through bank competition.

Although it has reduced the risk level of the financing sector to a certain extent[21], digital technology will also lead to information risks in commercial banks，and user information risks are intensified, thereby increasing the risk-taking level of commercial banks. Digital inclusive finance attracts deposits by raising deposit rates and optimizing service models, which affects the liability business and intermediary business of commercial banks and increases the risk-taking level of banks.

Hypothesis 3: The development of digital financial inclusion affects commercial bank business performance through commercial bank risk-taking.

3 Empirical Analysis

3.1 Data Sources

This article refers to the research of Qiu Han et al.[22] , and the development level of digital financial inclusion uses Peking University's digital financial inclusion index. the relevant data of commercial banks were obtained from The CSMAR Database, and the corresponding macroeconomic statistics were obtained from the National Bureau of Statistics and the "China Financial Statistical Yearbook " Data.

3.2 Measurement model setting

Through the Hausman test, this paper proposes to build the following model:

$$F_{it} = \alpha_0 + \beta_1 DFin_{it} + \beta_2 Controls_{it} + \mu_j + \eta_t + \varepsilon_{it} \tag{1}$$

$$F_{it} = \alpha_0 + \beta_1 F_{it-1} + \beta_2 DFin_{it} + \beta_3 Controls_{it} + \mu_i + \eta_t + \varepsilon_{it} \tag{2}$$

F_{it} represents the commercial bank's operating performance, i and t represent the commercial bank and the year respectively, $DFin_{it}$ represents the development level of digital inclusive finance, $Controls_{it}$ is the control variable, μ_i represents the bank's individual effect, η_t represents the time effect, ε_{it} is a random disturbance term.

3.3 Benchmark regression results

According to the empirical results in Figure 1, indicating that the development of digital financial inclusion has a negative impact on the operating performance of commercial banks. The predictions are consistent with our Hypothesis 1. And the business performance of commercial banks will be affected by the business performance of the previous period.

VARIABLES	f	f
	FE	SYSGMM
LF		0.516 ***
		(0.104)
lnDFIN	-0.765 ***	-0.292 ***
	(-3.190)	(0.090)
LEV	-0.344 ***	-0.059
	(-3.290)	(0.095)
CIR	0.001	0.001
	(0.770)	(0.001)
LNSIZE	0.047	0.014 *
	(0.630)	(0.007)
CPI	-0.021	0.035 **
	(-0.520)	(0.014)
lnGDP	-0.007	0.004
	(-0.150)	(0.013)
Constant	5.118	-2.401 *
	(1.100)	(1.393)
individual effect	YES	YES
time effect	YES	YES
Hausman test	0.011	
AR (2)		0.434
Hansen (p-value)		0.782

Figure 1: Regression results of digital financial inclusion on commercial bank performance

3.4 Inspection of the impact mechanism

This paper assesses the existence of such an influence mechanism by using a mediating effect model, and establishes the following model:

$$F_{it} = \alpha_0 + \beta_1 DFin_{it} + \beta_2 Controls_{it} + \mu_j + \eta_t + \varepsilon_{it} \quad (3)$$

$$\text{Lerner}_{it} = \alpha_0 + \beta_3 DFin_{it} + \beta_4 Controls_{it} + \mu_i + \eta_t + \varepsilon_{it} \quad (4)$$

$$F_{it} = \alpha_0 + \beta_5 DFin_{it} + \beta_6 Lerner_{it} + \beta_7 Controls_{it} + \mu_i + \eta_t + \varepsilon_{it} \quad (5)$$

$$risk_{it} = \alpha_0 + \gamma_3 DFin_{it} + \gamma_4 Controls_{it} + \mu_i + \eta_t + \varepsilon_{it} \quad (6)$$

$$F_{it} = \alpha_0 + \gamma_1 DFin_{it} + \gamma_2 Controls_{it} + \mu_i + \eta_t + \varepsilon_{it} \quad (7)$$

$$F_{it} = \alpha_0 + \gamma_5 DFin_{it} + \gamma_6 risk_{it} + \gamma_7 Controls_{it} + \mu_i + \eta_t + \varepsilon_{it} \quad (8)$$

	(1)	(2)	(3)	(1)	(2)	(3)
VARIABLES	F	Lerner	F	F	Lnz	F
lnDFIN	-0.765 ***	-0.0733 *	-0.686 ***	-0.765***	-0.861*	-0.666***
	(0.240)	(0.041)	(0.052)	(0.240)	(0.444)	(0.047)
Lerner			0.306 ***			
			(0.113)			
Lnz						0.062***
						(0.015)
LEV	-0.344 ***	-0.222 ***	0.384	-0.344***	-0.0917	-0.071
	(0.104)	(0.072)	(0.369)	(0.104)	(0.356)	(0.169)
CIR	0.001	-0.002 ***	0.002	0.000749	-0.00163	0.001
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
LNSIZE	0.0473	-0.067 ***	0.038 ***	0.047	0.075	-0.0028
	(0.075)	(0.015)	(0.013)	(0.0753)	(0.148)	(0.009)
CPI	-0.021	-0.026 ***	-0.051 ***	-0.0210	0.182**	-0.029*
	(0.041)	(0.007)	(0.018)	(0.041)	(0.073)	(0.017)
lnGDP	-0.007	-0.013 *	-0.003	-0.007	-0.06	0.008
	(0.046)	(0.007)	(0.015)	(0.046)	(0.080)	(0.015)
Constant	5.019	5.695 ***	7.309 ***	5.019	-11.640	6.148***
	(4.787)	(0.865)	(1.968)	(4.787)	(8.602)	(1.874)
individual fixation	YES	YES	YES	YES	YES	YES
fixed year	YES	YES	YES	YES	YES	YES
R-squared	0.454	0.835	0.245	0.454	0.387	0.242

Figure 2: Test of the mediating effect of bank competition and risk taking

According to the data in Figure 2, we can find that the development of digital inclusive finance increases the competition of commercial banks and increases the risk of commercial banks invisibly, which reduces the operating performance of commercial banks, thus verifying research hypothesis 2and3.

3.5 Conclusions and Suggestions

The empirical findings show that, first, the impact of digital financial inclusion on the operating performance of commercial banks shows a negative trend; second, by affecting competition and risk-taking among banks, digital financial inclusion will also affect the operating performance of commercial banks. First, change the business strategy. Commercial banks should change their business strategies；Second, continue to improve risk management capabilities. Third, the government should actively guide commercial banks to moderately compete to ensure their healthy development and avoid excessive competition, thereby reducing the adverse impact on the real economy.

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