

Original Paper

Research on the Impact of Fintech on the Profitability of Commercial Banks

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Abstract

The external competition brought about by the rapid rise of financial technology companies has prompted the banking industry to develop fintech businesses, and the development of fintech businesses will have a certain impact on bank performance. Based on the financial data of 20 listed commercial banks in China from 2014 to 2023, this paper researches the impact of fintech development on bank performance. Preliminary analysis through panel regression shows that the development of fintech business has reduced the operating performance of the banking industry. By constructing period dummy variables, this paper analyzes the changes in the impact of fintech development on bank performance in different periods. Fintech is an emerging thing and has its imperfect side. The banking industry should accelerate the pace of financial innovation, build its own fintech business, and cooperate with fintech enterprises to achieve mutual benefit and win-win results, so as to enhance the overall competitiveness of China's banking industry with the development of fintech.

Keywords

Fintech; Commercial Bank Profitability; Panel Regression Analysis

1. Introduction

In recent years, fintech has developed rapidly on a global scale, becoming an important focus in the global financial field and an important force driving the transformation and upgrading of the financial industry. With the extensive application of new information technologies such as big data, cloud computing, and artificial intelligence, the level of digitization, intelligence, and networking of financial services has improved significantly, bringing new vitality and opportunities to the financial market. With the in-depth development of economic globalization, international competitive pressure has put forward higher requirements for the competitiveness of China's commercial banks. At the same time, in China,

the deepening reform of the financial market and the continuous improvement of the degree of opening up mean that the market environment faced by commercial banks has also undergone profound changes. The traditional banking business model is gradually being impacted by emerging fintech enterprises, and customer needs are increasingly diversified and personalized. Against this background, commercial banks must accelerate digital transformation and upgrading to enhance their own competitiveness to cope with market changes and challenges. This is not only conducive to the healthy development of commercial banks themselves but also helps the stability and prosperity of the entire financial system and economy, enhances the status and influence of China's banking industry on the international stage, and promotes the internationalization process of China's financial industry. The main purpose of this paper is to explore how fintech affects the profitability of commercial banks and how commercial banks should adapt to this change to maintain and enhance their competitive advantages. Through in-depth research on the mechanism, degree of impact, and coping strategies of fintech on the profitability of commercial banks, this paper provides a useful reference for improving the competitiveness of commercial banks.

2. Literature Review and Theoretical Analysis

2.1 Literature Review

Information asymmetry theory (Akerlof, 1970) and the credit rationing model (Stiglitz & Weiss, 1981) constitute the theoretical cornerstone of traditional bank risk control. Chinese scholar Zhang Chengsi (2020) pointed out in "Fintech and Credit Risk Mitigation" that the limitations of traditional risk control relying on structured financial data are magnified in the digital economy era, especially the failure of assessment for "no credit record" long-tail customers. Li Guangzi's (2021) empirical research based on panel data of Chinese commercial banks shows that the introduction of non-financial behavior data can improve the prediction accuracy of small and micro-enterprise loan defaults by 19%-25% (published in *Economic Research*). This echoes the findings of international research, such as Begenau et al. (2022), who found that U.S. banks can reduce credit scoring errors by 12% by integrating social media data. The "Fintech Development Plan (2022-2025)" of the People's Bank of China explicitly proposed the goal of "building smart risk control infrastructure," promoting the transformation of commercial banks from "rule-oriented" to "data-algorithm dual-engine".

Sajid Rabbia, Ayub Huma, Malik Bushra F., and Ellahi Abida (2023) adopted quantitative research methods, collecting secondary data from annual reports of 50 commercial banks in emerging countries including China, India, Pakistan, and Bangladesh from 2014 to 2021 to test the theoretical mediation model. They found that fintech products reduce the risk-taking behavior of banks by improving their operating efficiency, and in emerging countries, operating efficiency mediates the relationship between fintech products and bank risk-taking behavior. Lamia Kalai et al. (2024), through a comparative analysis of fintech ecosystems in the U.S. and Canada from 2018-2023, substantively tested that fintech has a

positive impact on the performance and financial growth of commercial banks but a negative impact on liquidity and financial risk.

Jing (2024) analyzed the specific reasons for commercial banks to develop fintech from a theoretical perspective, explained the impact of fintech on the development of commercial banks, and through empirical testing, concluded that the application of fintech has “risk management effects” and “transformation effects” on some commercial banks in China. Hatim (2022), using the SWOT analysis method, found that in the environment of fintech transformation, city commercial banks have higher credit levels compared to fintech enterprises or institutions, possessing local and timeliness advantages, but also have the disadvantage of overly traditional business models. In addition, the development of fintech has brought opportunities for city commercial banks such as the expansion of intermediate business scale, improvement in information utilization efficiency, and service levels, and has also posed threats to the traditional business and profitability of city commercial banks. Wang (2020) analyzed from the perspective of technological progress, believing that currently, China’s fintech level is positively correlated with the competitiveness level of commercial banks, and the development level of fintech has different degrees of impact on various businesses of different types of commercial banks, and there are also differences in the enhancement effects.

2.2 Theoretical Analysis

Fintech is a new financial business model that uses mature internet technology and advanced information communication technology to conduct financial intermediation, capital investment, payment settlement, and information intermediary services. Different from traditional finance, fintech is not restricted by time and space. It can use cloud computing platforms, network search engines, big data, and other methods for information dissemination and processing, making transaction costs lower. Suppliers and demanders of funds can bypass bank intermediaries, forming disintermediation. As intermediaries, commercial banks are bypassed, and the intermediary role of commercial banks in the financial market is gradually weakened, which indirectly affects many businesses of commercial banks. Therefore, the development of fintech will bring a greater impact on financial institutions acting as financial intermediaries. Specifically, fintech impacts bank profitability from the following three aspects.

Impact of Fintech on Commercial Bank Asset Business. Credit business is the most basic asset business of commercial banks. The number of small, medium, and micro enterprises far exceeds that of large enterprises, and the demand for funds is huge. However, due to the harsh lending conditions of banks, it is difficult for many small, medium, and micro enterprises to obtain loans from commercial banks. The development of fintech has solved the problem of difficult loans for these enterprises to a certain extent. For example, internet microfinance companies represented by Alibaba Finance have quickly occupied the market of many small and micro enterprises. In addition, many financial micro-loan products launched by internet companies have impacted the loan business of commercial banks. For example, JD’s IOUs and Alipay’s Ant Huabei allow consumers to loan instantly, shop online, and pay directly, which is very convenient. This also causes commercial banks to lose some potential customer groups.

Impact of Fintech on Commercial Bank Liability Business. Deposit business is the main liability business of commercial banks; it is the source of most funds for liability business. In addition, commercial banks' liability business also includes borrowing from the central bank, interbank lending, interbank deposits, and inter-system deposits. For a long time, the Chinese public has a habit of saving, which is related to China's national conditions and traditional concepts. Under this influence, commercial banks have a large amount of deposits. In recent years, with the rise of fintech and the improvement of people's living standards, the concept of investment and financial management has taken root in people's hearts. The public no longer stores all funds in banks but takes out a part of the funds for investment and financial management. The appearance of Yu'e Bao or WeChat's financial products will have a certain impact on the deposit business of commercial banks, thereby affecting the bank's liability business.

Impact of Fintech on Commercial Bank Intermediate Business. As an important payment intermediary in the financial market, commercial banks occupy a large intermediary market. Commercial banks have advantages such as a wide range of business involvement, good reputation, and complete relevant professional talent. Commercial banks can use these advantages to provide intermediary services for both suppliers and demanders of funds without using the bank's own funds, charging fees and agency fees from both parties. In recent years, fintech payment platforms have begun to expand their business areas, seizing part of the financial intermediary market. Taking Alipay as an example, currently, most urban residents can pay for living projects such as water and electricity, natural gas fees, etc., through the Alipay platform online. In addition, they can also book flight tickets, high-speed rail tickets, and many other services through Alipay. In the fourth quarter of 2019, the transaction scale of China's third-party mobile payment was approximately 59.8 trillion yuan, a year-on-year increase of 13.4%. Internet third-party payment will inevitably have a certain impact on the payment and settlement business of commercial banks.

Hypothesis 1: The development of fintech will have a negative impact on commercial bank business and reduce its profitability.

Fintech has opened up a large number of niche markets ignored by most banks with absolute advantages; these shared market shares may exceed those of mainstream products. The classic "Pareto Principle" (or 80/20 Rule) refers to 20% of people holding 80% of society's resources and wealth, and 80% of people holding 20% of society's resources and wealth. This phenomenon indicates that social resource allocation is not balanced. Traditional commercial banks believe that although the number of 80% of customers is huge, these 80% of customer groups are ordinary customers, namely individuals and small and micro enterprises, not high-net-worth customers, and the profit brought by them is very small. Traditional commercial banks lock their key lending targets on customers with high-quality resources and sometimes give up small and micro enterprises and individual customers with smaller asset scales. The emergence of fintech has changed the financial market environment, focusing on developing the 80% of customers ignored by banks. Fintech, through internet technologies such as big data and cloud computing, uses its efficient and convenient advantages to seize the remaining 80% of low-net-worth customers ignored by

banks. By establishing a sound credit investigation system, it quickly grasps the basic information such as the integrity and assets of these customers and comprehensively analyzes whether to lend to them, the loan amount, and the term. This is conducive to excluding traditional commercial banks and obtaining long-term appreciation potential. On this basis, fintech business will surely penetrate into the traditional business field of the banking industry with the help of business expansion. Therefore, fintech business has huge market development space and growth potential, and its impact on the banking industry will be long-term and far-reaching.

The construction of an inclusive financial system refers to providing appropriate, efficient, and convenient financial services to all social classes at an affordable cost, adhering to the principles of equal opportunity and sustainable commercial operation. Among all social classes, the important support objects of inclusive finance are relatively vulnerable groups such as small and micro enterprises, farmers, and low-income urban groups. Its purpose is to eliminate poverty and achieve relative fairness in the allocation of social financial resources. Fintech, through its advantage of more symmetric information relative to traditional financial institutions, has established a large number of credit investigation systems for many vulnerable groups with financial needs, providing suitable financial services for vulnerable groups, successfully solving the fund needs of vulnerable groups, and can well avoid the possibility of many bad debts, reducing the loan threshold for vulnerable groups and transaction costs. From this perspective, fintech has its social inevitability for existence and development.

Hypothesis 2: The negative impact brought by the development of fintech on traditional commercial bank business will continue to deepen.

There are differences in the regulation of the financial industry by the state in different periods. 2013 is known as the “First Year of Fintech,” a year of rapid development of fintech. Various fintech innovation models such as third-party payment, P2P financing, online wealth management, and crowdfunding have developed rapidly. Disorderly and rapid development will inevitably produce many problems and bring many hidden dangers of financial risks. Therefore, the national financial management departments issued a series of regulatory policy measures for fintech intensively from 2016 to 2018. Among them, 11 regulatory measures were issued in 2016, such as the “Interim Measures for the Administration of Business Activities of Online Lending Information Intermediaries” issued in August 2016, the “Guiding Opinions on Promoting the Healthy Development of Fintech” promulgated in September, and the “Notice on the Implementation Plan for Special Rectification of Fintech Risks” officially released by the State Council in October. In 2017, relevant departments issued another 5 regulatory policies for fintech.

By 2018, the disorderly development momentum of fintech was reversed, and fintech entered a period of orderly and healthy development. During this period, the convenient and efficient operation of fintech, coupled with the huge internet user group and the support of policy norms, these advantages have promoted the stable development of fintech for a long period. Fintech can quickly occupy part of the financial market.

Hypothesis 3: The impact of fintech on banking performance varies in different periods, and the stable development period after regulatory policies is more likely to bring a greater negative impact on banking operating performance.

3. Research Design

3.1 Data Sources

Comprehensively considering the integrity of commercial banks' annual financial data, as well as the scale and market status of commercial banks, this paper selects 20 listed commercial banks as research samples, including 5 state-owned commercial banks (CCB, BOC, ABC, ICBC, BoCom), 8 joint-stock commercial banks (CMB, CIB, CITIC, Hua Xia, CMBC, CEB, SPDB, CZB), and 7 city commercial banks (Bank of Ningbo, Bank of Shanghai, Bank of Nanjing, Bank of Suzhou, Bank of Zhengzhou, Bank of Beijing, Bank of Hangzhou). The data is selected from the annual financial reports of these 20 listed commercial banks from 2014 to 2020; since there is no fixed indicator to explain the development level of fintech, this paper takes the transaction scale of the three main businesses of fintech as the research sample, and the data is selected from the annual transaction scale from 2014 to 2023. All data are sourced from the Tonghuashun Data Center and iResearch.

3.2 Variable Setting

This paper selects Return on Assets (ROA) and Return on Equity (ROE) as dependent variables. Return on Assets (ROA) refers to how much profit can be generated per unit of asset; the larger its value, the greater the profitability of the commercial bank. Its formula is: $\text{Asset Return Rate} = \text{Net Profit After Tax} / \text{Total Assets}$. Return on Equity (ROE) is the shareholder return rate; the larger its value, the higher the investment return, and the stronger the commercial bank's ability to obtain net income. Its formula is: $\text{Return on Equity} = \text{Net Profit} / \text{Net Assets}$.

For the setting of explanatory variables. The three main transaction modes of fintech are third-party payment, internet lending, and internet wealth management funds, and their annual transaction scale can measure the development status of fintech. This paper takes third-party payment as an example to analyze the impact of fintech on banking performance. This paper selects third-party payment transaction scale (Escrow), online lending transaction scale (WD), and internet wealth management user scale (IFU) as explanatory variables.

This paper selects commercial bank asset size (SIZE), non-performing loan ratio (NPLR), capital adequacy ratio (CAR), and core capital adequacy ratio (CCAR) as control variables in this paper, and selects economic growth rate (GGDP) as a macro-level control variable. Asset size can indicate the strength of commercial bank profitability; non-performing loan ratio (NPLR) is a commercial bank risk control indicator; capital adequacy ratio (CAR) is the ratio of commercial bank assets to risk assets, indicating an indicator of the normal operation and development of commercial banks. The core capital adequacy ratio is an indicator reflecting the ability of commercial banks' own capital to resist risks. All numerical variables among all variables have been logarithmized.

Table 1. Descriptive Statistical Analysis

	Obs	Mean	Std. Dev.	Min	Max
ROA	200	0.95	0.19	0.51	1.43
ROE	200	14.37	3.37	6.81	26.22
ESCROW	200	13.40	1.39	11.00	14.72
WD	200	9.79	2.23	5.28	11.96
IFU	200	9.39	0.29	8.96	9.73
SIZE	200	10.45	1.33	7.62	12.72
NPLR	200	1.42	0.35	0.75	2.47
CAR	200	13.32	1.56	10.60	17.52
CCAR	200	9.91	1.50	7.93	13.88
GGDP	200	6.11	1.60	2.3	7.4

3.3 Model Construction

This paper uses regression analysis and constructs a regression model using panel data. The econometric model is constructed as follows:

$$Y_{i,t} = \alpha_1 + \beta_1 X_{i,t} + \theta Z_{i,t} + \varepsilon_{i,t} \quad (1)$$

In Equation (1), $Y_{i,t}$ is the dependent variable, representing ROA and ROE respectively; $X_{i,t}$ is the explanatory variable, representing ESCROW, WD, and IFU respectively; $Z_{i,t}$ is the set of control variables; and $\varepsilon_{i,t}$ is the error term.

2. Analyzing Whether Fintech Affects the Future Profitability of Banks Using the Lagged Period of Explanatory Variables

Whether fintech has an impact on the future profitability of the banking industry is also a focus of this paper's analysis. Considering both the long-term nature of lag effects and the sample size, this paper comprehensively analyzes the impact of fintech development on the future performance of the banking industry using the first and second lags of fintech development, constructing the following model:

$$Y_{i,t} = \alpha_1 + \beta_1 X_{i,t-1} + \beta_2 X_{i,t-2} + \theta Z_{i,t} + \varepsilon_{i,t} \quad (2)$$

3. Constructing Period Dummy Variables to Analyze the Trend of Fintech'S Impact on Bank Performance

This paper divides the observation period into three periods: 2014-2016 (the period before the intensive introduction of policies), 2017-2019 (the period of intensive introduction of policies), and 2020-2023 (the third period). It analyzes the changes in the impact of fintech on banking performance in the three periods.

$$Y_{i,t} = \alpha_1 + \beta_1 X_{i,t} + \beta_2 X_{i,t} * D + \theta Z_{i,t} + \varepsilon_{i,t} \quad (3)$$

In the above equation, D is the dummy variable for the period; D=1 is the first period; D=2 is the second period; D=3 is the third period.

4. Empirical Analysis

4.1 Regression Analysis

Based on Model (1), the regression results in Table 2 are obtained.

Table 2. Empirical Analysis of the Impact of Fintech on Banking Performance

	(1)	(2)	(3)	(4)	(5)	(6)
	$ROA_{i,t}$	$ROE_{i,t}$	$ROA_{i,t}$	$ROE_{i,t}$	$ROA_{i,t}$	$ROE_{i,t}$
ESCROW $_{i,t}$	-0.0534*** (0.0148)	-0.886** (0.368)				
WD $_{i,t}$			-0.0306*** (0.00848)	-0.507** (0.210)		
IFU $_{i,t}$					-0.246*** (0.0683)	-4.085** (1.696)
SIZE $_{i,t}$	0.127* (0.0670)	0.255 (1.749)	0.127* (0.0670)	0.255 (1.749)	0.127* (0.0670)	0.255 (1.749)
NPLR $_{i,t}$	-0.187** (0.0663)	-4.305*** (1.177)	-0.187** (0.0663)	-4.305*** (1.177)	-0.187** (0.0663)	-4.305*** (1.177)
CAR $_{i,t}$	0.000966 (0.0116)	0.0433 (0.199)	0.000966 (0.0116)	0.0433 (0.199)	0.000966 (0.0116)	0.0433 (0.199)
CCAR $_{i,t}$	0.0120 (0.0148)	-0.404* (0.213)	0.0120 (0.0148)	-0.404* (0.213)	0.0120 (0.0148)	-0.404* (0.213)
GDP $_t$	0.0148*** (0.00285)	0.303*** (0.0731)	0.0137*** (0.00282)	0.286*** (0.0709)	0.0180*** (0.00309)	0.357*** (0.0835)
Constant	0.373 (0.590)	30.68* (15.87)	-0.0447 (0.681)	23.74 (18.47)	1.969*** (0.388)	57.15*** (8.002)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	200	200	200	200	200	200
R-squared	0.762	0.819	0.762	0.819	0.762	0.819

As shown by the regression analysis results, the model fit degrees for the dependent variables ROA and ROE are 0.762 and 0.819 respectively, representing that third-party payment scale, internet lending scale, internet wealth management user scale, and all control variables explain 76.2% and 81.9% of the total

asset return rate respectively. This indicates significant regression results. The first column shows that the coefficient of third-party payment transaction scale (ESCROW) is -0.0534, indicating that for every 1% increase in third-party payment transaction scale, the bank's ROA decreases by 0.0534%. The second column shows that the coefficient of third-party payment transaction scale (ESCROW) is -0.886, indicating that for every 1% increase in third-party payment transaction scale, the bank's ROA decreases by 0.886%. Both are significantly negative at the 1% level. The third and fourth columns show the impact of internet lending transaction scale (WD) on bank performance, and the fifth and sixth columns show the impact of internet wealth management user scale (IFU) on bank performance. Both are significantly negative at the 1% level, indicating that the increase of WD and IFU significantly brought about a decline in bank performance measured in two ways.

From the control variables, it can be seen that the higher the bank asset (SIZE), the better the bank return, which is more obvious for returns measured by ROA. An increase in non-performing loan ratio (NPLR) significantly reduces bank returns. The higher the core capital adequacy ratio, the higher the bank return. It can be seen that the model setting is reasonable.

4.2 Analysis of Lag Effects

Based on Model (2), analyze whether fintech has a long-term negative impact on bank performance. The regression results are shown in Table 3.

Table 3. Analysis of the Long-term Impact of Fintech on Banking Performance

	(1)	(2)	(3)	(4)	(5)	(6)
	$ROA_{i,t}$	$ROE_{i,t}$	$ROA_{i,t}$	$ROE_{i,t}$	$ROA_{i,t}$	$ROE_{i,t}$
ESCROW _{<i>i,t-1</i>}	0.265*** (0.0601)	3.849*** (1.144)				
ESCROW _{<i>i,t-2</i>}	-0.284*** (0.0526)	-4.265*** (1.069)				
WD _{<i>i,t-1</i>}			-1.210*** (0.247)	-17.92*** (4.836)		
WD _{<i>i,t-2</i>}			0.685*** (0.146)	10.07*** (2.822)		
IFU _{<i>i,t-1</i>}					0.703** (0.302)	8.991 (5.472)
IFU _{<i>i,t-2</i>}					-0.983*** (0.272)	-13.85** (5.020)
Control Var	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Observations	200	200	200	200	200	200
R-squared	0.584	0.658	0.584	0.658	0.584	0.658

After controlling for relevant control variables and individual and year effects, the first column in the table above shows that the coefficient of $ESCROW_{i,t-1}$ is 0.265, and the coefficient of $ESCROW_{i,t-2}$ is -0.284, the sum of the two coefficients is -0.019. The T-test shows that the absolute value of their sum is significantly less than 0, indicating that in the long run, the increase of fintech third-party transaction scale (ESCROW) significantly reduces the future performance of the banking industry measured by ROA. By analogy, the current development of fintech, such as third-party transaction scale (ESCROW) and internet lending transaction scale (WD), may reduce the future operating performance of the banking industry measured by ROA and ROE.

To analyze the impact of fintech development on banking performance in different periods, the corresponding empirical results in Table 4 are obtained based on Model (3).

Table 4. Analysis of Differences in the Impact of Fintech on Banking Performance in Different Periods

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	$ROA_{i,t}$	$ROE_{i,t}$	$ROA_{i,t}$	$ROE_{i,t}$	$ROA_{i,t}$	$ROE_{i,t}$
$ESCROW_{i,t}$	-0.0651*** (0.0201)	-1.231** (0.456)				
$ESCROW_{i,t} * D$ (D=2)	0.00231 (0.00278)	0.0705 (0.0502)				
$ESCROW_{i,t} * D$ (D=3)	0.00257 (0.00224)	0.0314 (0.0445)				
$WD_{i,t}$			-0.0206** (0.00889)	-0.212 (0.194)		
$WD_{i,t} * D$ (D=2)			-0.00566*** (0.00149)	-0.115*** (0.0282)		
$WD_{i,t} * D$ (D=3)			-0.00638*** (0.00220)	-0.189*** (0.0488)		
$IFU_{i,t}$					-0.172*** (0.0558)	-3.754*** (1.236)
$IFU_{i,t} * D$ (D=2)					-0.00601** (0.00273)	-0.0592 (0.0524)
$IFU_{i,t} * D$ (D=3)					-0.00421** (0.00197)	-0.0801 (0.0515)

Control Var	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	200	200	200	200	200	200
R-squared	0.760	0.810	0.754	0.797	0.759	0.816

In Table 4, the interaction term group with D=1 is the baseline group with a coefficient of 0, omitted in the regression results. From the regression results, the coefficients of ESCROW in the first and second columns are not significant, indicating that there is no significant difference in the impact of ESCROW on banking performance in the three periods. In the third column, the coefficient of $WD_{i,t}$ is significantly -0.0206 at the 5% level, indicating that for every 1% increase in WD, commercial banks' ROA decreased by 0.0206% in 2015-2015. The coefficient of $WD*D(D=2)$ is -0.00566 at the 1% significance level, indicating that in 2016-2018, for every 1% increase in WD, the level of decline in banking ROA was 0.00566 higher than that in 2014-2015, i.e., banking ROA decreased by 0.0263%. The fourth column shows that in 2019-2020, for every 1% increase in WD, banking ROA decreased by 0.0270%. It can be seen that for the banking industry, with the year-by-year advancement of fintech, the negative impact of internet lending transaction scale (WD) on banking performance is gradually deepening. The fourth column is the impact of WD on banking ROE in different periods, and the empirical results are similar to the third column. The fifth and sixth columns show the impact of internet wealth management user scale (IFU) on banking ROA and ROE respectively, also indicating that its negative impact is gradually deepening

4.3 Robustness Check

For the regression analysis of Model (2), there may be endogeneity problems. To correct the bias, this paper uses the GMM model to conduct a robustness check on Model (2). The constructed model is as follows:

$$Y_{i,t} = \alpha_1 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t-1} + \beta_3 X_{i,t-2} + \theta Z_{i,t} + \varepsilon_{i,t} \quad (4)$$

For the GMM estimation variable setting, we set the dependent variable as an endogenous variable, set the explanatory variable and other control variables as predetermined variables or exogenous variables, and use all possible lag terms of all variables as instrumental variables for the endogenous variable. The regression results are shown in Table 5.

Table 5. GMM Empirical Analysis of the Long-term Impact of Fintech on Banking Performance

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	$ROA_{i,t}$	$ROE_{i,t}$	$ROA_{i,t}$	$ROE_{i,t}$	$ROA_{i,t}$	$ROE_{i,t}$
$ROA_{i,t-1}$	0.583*** (0.165)		0.736*** (0.142)		0.620*** (0.105)	
$ROE_{i,t-1}$		0.587*** (0.155)		0.661*** (0.204)		0.251 (0.422)
$ESCROW_{i,t-1}$	0.0116 (0.0163)	0.409 (0.280)				
$ESCROW_{i,t-2}$	-0.0158* (0.00820)	-0.576** (0.224)				
$WD_{i,t-1}$			-0.611*** (0.212)	-2.056* (1.163)		
$WD_{i,t-2}$			0.324** (0.123)	1.134* (0.626)		
$IFU_{i,t-1}$					0.148 (0.106)	-1.340 (2.309)
$IFU_{i,t-2}$					-0.189* (0.0946)	-2.671** (1.019)
AR(1)	0.035	0.018	0.029	0.017	0.023	0.038
AR(2)	0.120	0.295	0.930	0.166	0.185	0.170
Hansen	0.953	0.951	0.639	0.945	0.851	0.155
Observations	200	200	200	200	200	200

In the first column of the table above, it can be seen that the coefficient of ESCROW is 0.0116, while the coefficient of $ESCROW_{i,t-2}$ is -0.0158 and the significance level reaches 10%. The sum of the two coefficients is -0.0042, which reaches the 5% significance level after a T-test. This indicates that the current development of fintech measured by third-party transaction scale (ESCROW) will reduce the future operating performance of the banking industry measured by ROA, thereby reducing the profitability of banks. The third and fourth columns show that the expansion of internet lending transaction scale (WD) reduces the future operating performance of the banking industry measured by ROA and ROE. The fifth and sixth columns show that the expansion of internet wealth management user scale (IFU) reduces the future operating performance of the banking industry measured by ROA and ROE. The robustness check reached the same conclusion as the previous text, further confirming that the development of fintech not only reduces the current operating performance of the banking industry but

also reduces the future operating performance of the banking industry, thereby reducing both the current and future profitability of banks.

5. Conclusions and Suggestions

5.1 Conclusions

Based on theoretical analysis and empirical analysis using panel data constructed from the financial data of 20 listed commercial banks from 2014 to 2023, this paper draws the following main conclusions: (1) The development of fintech has reduced the profitability of the banking industry. (2) The development of fintech has not only reduced the current profitability of the banking industry but also reduced the future profitability of the banking industry; the impact of fintech on bank performance has a lag effect. (3) There is a period difference in the reduction of banking industry profitability by fintech. The research shows that with the passage of time, the negative impact of fintech development on bank profitability is increasing, and the negative impact of fintech development on banking industry profitability is more obvious in the period after the state intensively introduced normative financial regulatory policies.

5.2 Policy Suggestions

Commercial banks should combine advanced internet technology with their own advantages to develop new innovative products with fintech attributes. When developing products, it is necessary to conduct feasibility studies on the market, ensuring that product development and sales are coordinated. They should vigorously cultivate relevant professionals in fintech, enhance the innovation ability of in-service employees, work together to improve, and train a team of compound innovative talents to provide a large number of professional reference suggestions for relevant departments. Commercial banks can explore new fintech, use electronic information technology, increase the innovation intensity of high-tech products in online banking to improve business efficiency and reduce operating costs. They should upgrade traditional businesses, increase innovation in intermediate businesses and off-balance sheet businesses, expand business areas, enable business departments to better serve customers, increase customer satisfaction, and reduce product homogeneity. Commercial banks should develop a personalized fintech path.

While firmly grasping large customers, they should show goodwill to small customers. Commercial banks have advantages such as high credit value, strong security, and strong supervision, making high-net-worth large customers who focus on fund safety more inclined toward commercial banks. Fintech has an inclusive nature. For small and micro enterprises and individual customers who account for the vast majority of fund demand in the financial market, these customers are small customers for commercial banks. Fintech has limited appeal to high-net-worth groups, but this does not mean that commercial banks should give up the huge number of small customer groups. Small customers have great development potential; giving up small customer groups means losing a large number of future high-net-worth customers. Commercial banks should differentiate and subdivide customer groups. For high-net-worth large customers, commercial banks should provide them with better service experiences. At the

same time, they should use internet technologies such as big data and cloud data for data processing to fully assess the credit, assets, and fund needs of small customers and develop small customers.

Cooperate with fintech enterprises to achieve mutual benefit and win-win results. In the context of fintech, commercial banks need to understand the impact of fintech on the financial market and themselves. Commercial banks can cooperate with fintech enterprises. Commercial banks have massive enterprise information resources, and both parties can share their own resource information. By combining the large customer credit transaction database of internet enterprises with the good risk control ability of commercial banks, they can establish a new financing platform serving small and micro enterprises, which not only promotes the development of inclusive finance but also enables both parties to obtain profits, forming a situation of mutual benefit and win-win

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