ISSN 2616-5902 Vol. 6, Issue 5: 8-14, DOI: 10.25236/AJBM.2024.060502

Research on the Impact of Financial Innovation on the Operating Performance of Listed Commercial Banks

Luo Binhang

School of Economics and Management, Guangxi Normal University, Guilin, China
luobinhang1999@163.com

Abstract: *Modern commercial banks are in the core position in the financial and economic field of our country, and are important financial institutions in our country, which have a decisive influence on the regulation and control of the national economy. Only by promoting the in-depth development of financial innovation can listed banks improve their operating capabilities and competitive advantages, and thus improve the operating performance of listed commercial banks. This paper takes 54 listed commercial banks in China from 2013 to 2019 as samples, conducts multiple linear mixed regression analyses on the panel data of listed banks, and analyzes the effectiveness and influence of financial innovation on the operational performance of listed commercial banks through the fixed-effect model. The conclusions are as follows: 1) Financial innovation effectively improves the operating performance of listed banks; 2) The loan scale plays a significant intermediary role in the impact of financial innovation on the operating performance of listed banks; 3) The loan and deposit efficiency plays a significant intermediary role in the influence of financial innovation on the operating performance of listed banks. Therefore, on this basis, reasonable suggestions are put forward: 1) Commercial banks should further strengthen the innovation and service of financial products; 2) Commercial banks should coordinate the resonance ability of financial innovation and credit scale; 3) Commercial banks should strengthen financial innovation and credit risk. To commit to the long-term operation of banks, and promote the sustainable development of listed commercial banks.*

Keywords: *Financial innovation; Business performance; Listed bank*

1. Introduction

Ever since finance was created, it has been constantly innovated. Financial innovation is based on modern Internet technology. Through the use of modern emerging science and technology such as cloud computing, the Internet of Things, and artificial intelligence, the financial industry and fields provide customers with intelligent services and implement business process innovation and other forms of financial business services. In the context of Internet finance, the future of banks must rely on financial innovation to transform and develop, to have a positive impact on the operating performance of banks. Therefore, the influence of financial innovation on the internal economic indicators of the banking industry has attracted much attention.

With the deepening of the opening degree of China's financial market and the continuous promotion of the reform of the financial system, a large number of foreign banks entered the Chinese market, breaking the original balance of China's financial market, making the profit space of commercial banks smaller and smaller, and relying on its tradition can not meet the needs of their development. For our listed banks, it is both a challenge and an opportunity[1].

Financial innovation is an effective way for listed commercial banks to obtain financial resources, transform resources, and create resources, as well as an important factor in the core competence of banks, which can gain competitive advantages for listed banks and improve their operating performance. The financial innovation of listed banks can realize the optimal transformation of capital management, speed up the development trend of financial technology, and steadily promote the comprehensive digital transformation of products, channels, internal control, and decision-making. By carrying out financial innovation activities, banks can develop their financial innovative products, innovate their business models, and innovate their development concepts, so as to promote the sustainable construction and development of the banks' industries and achieve the ultimate goal of steadily improving their business performance. It is an inevitable choice for listed commercial banks to continuously improve their operating ability through financial innovation.

ISSN 2616-5902 Vol. 6, Issue 5: 8-14, DOI: 10.25236/AJBM.2024.060502

2. Concept definition

2.1. Financial innovation

In 1985, Friedman, an American economist, regarded financial innovation as "a change of the international monetary system", which was the earlier understanding of the definition of financial innovation. Financial innovation can be divided into two categories, narrow and broad. Narrow financial innovation mainly refers to the innovation of financial products, while broad financial innovation not only refers to the innovation of financial products but also includes the innovation of financial institutions and financial systems.

With the development of science and technology and the economy going hand in hand, the content of financial innovation is becoming more and more diversified and high-tech. In terms of the innovation of financial products, take the banking business as an example, financial innovation has brought about tremendous changes in the traditional business of banks so that the business that needed to be handled manually in the past can be easily handled by customers on the Internet, and all tend to be electronic. On the basis of the daily savings, loans, and foreign exchange business, the innovation of financial products has shifted more to intermediate business, asset business, and new bonds.

2.2. Operating performance of listed banks

Scholars at home and abroad have conducted extensive analysis and research on the operating performance of listed banks. Chen Wenhui et al. (2021) found that the operating performance of joint-stock commercial banks is generally better than that of state-owned commercial banks and city commercial banks[2]. According to the literature of commercial banks studied at present, the traditional profit model of commercial banks, which mainly relies on interest rate difference income, is no longer sustainable. In order to seek to create new profit models and profit growth points, listed banks must strengthen innovation to break the limitations of business development. The innovation ability of listed banks is reflected in all aspects of the bank, specifically, the governance level, management mode, and innovation culture of the whole bank will be affected by the innovation ability of listed banks. Therefore, it is crucial to explore the impact of financial innovation on the operating performance of listed banks.

3. An empirical study on the impact of financial innovation on the operating performance of listed commercial banks in China

3.1. Theoretical analysis and research hypothesis

Financial innovation can greatly affect the operational performance of the real economy. According to the research of Lu Zhaoyang and Ma Hui (2021), financial innovation can promote the growth of the regional real economy by encouraging technological innovation of enterprises[3]. Xu Yanping (2021) believes that the characteristics of virtualization and incomplete information symmetry of Internet finance increase the difficulty of financial innovation under the new situation. To make such business integration continue, it is necessary to adjust the thinking and increase the research on financial innovation and wealth management to meet the needs of this era[4]. Wu Shuai (2021) believes that when the relative speed difference between financial innovation, real economy innovation, and risk supervision innovation is not large, the coupling of financial innovation and financial risk will become a benign interaction, thus achieving a spiral rise in the development of the financial market[5].

Similarly, this paper holds that the impact of financial innovation on the operating performance of listed commercial banks is also applicable. Listed banks are the key to the high-quality development of China's banking industry and the cornerstone of the country's financial stability. The "Analysis Report of China's Listed Banks" points out that listed banks are the benchmark and vanguard of China's banking industry. Through targeted analysis and judgment of listed banks' operating performance, identifying advantages, and seeking optimal solutions to problems, it provides a valuable reference for commercial banks to study and judge the future development path. When the innovation ability of a bank is strengthened and improved, the governance level, management mode, innovation culture, organizational structure, and process of the whole listed bank will be greatly improved and optimized. Under the comprehensive effect of multiple influencing factors, financial innovation will have a positive and favorable impact on the operating performance of listed banks. Therefore, based on the

ISSN 2616-5902 Vol. 6, Issue 5: 8-14, DOI: 10.25236/AJBM.2024.060502

above analysis, the following hypotheses can be proposed:

H1: Financial innovation has a positive impact on the operating performance of listed banks

H2: Financial innovation has a negative or no significant impact on the operating performance of listed banks

3.2. Research design

3.2.1. Variable and sample selection

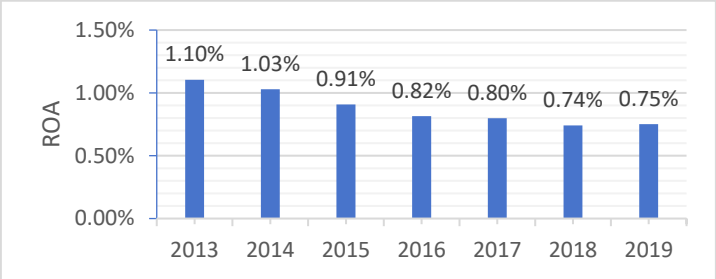
Core explanatory variable: financial innovation level

The explanatory variable selected in this paper is financial innovation, which is represented by the Intermediate income ratio. In reality, financial innovation generally cannot be directly detected, so proxy variables are needed to be used to express it. Intermediate business income in some literature is expressed by the proportion of non-interest income in business income (for example, Wu Chengsong et al.,2014) in some literature, intermediate business income is expressed by the scale or increase or decrease of income indicators such as bank fees and commission income. Combined with the research of scholars, the actual situation of listed banks, and the availability of data, this paper uses the intermediate business income ratio expressed by the proportion of bank fees and commission income in operating income to measure the degree of financial innovation.

Explained variable: operating performance of listed banks

With reference to Zhong Kaiyang (2019), this paper selects ROA: return on assets (that is, the ratio of net profit to annual total assets) as the explained variable to be used as the proxy variable to measure the operating performance of listed banks. Therefore, this paper uses ROA to represent this variable. In the robustness test, this paper selects ROE: return on equity (that is, the ratio of net profit to annual net assets) as an auxiliary agent variable to test the impact of financial innovation on the operating performance of listed banks.

As a major component of the operating performance of listed banks, according to the data from 2013 to 2019, the average proportion of the return on assets of 54 listed banks in each year is shown in Figure 1, where:



Source: Self-collated based on the annual reports of 54 listed banks from 2013 to 2019.

Figure 1: Average annual ROA value of 54 listed banks from 2013 to 2019.

The average proportion of return on assets over the six years from 2013 to 2019 was 0.88%. Compared with other years, the average return on assets in 2013 accounted for the highest proportion of 1.10%; The return on assets in 2018 was a relatively low 0.74%. It can be found that return on assets can fully reflect the development of listed banks and serve as an important proxy variable for the operating performance of listed banks. In recent years, with the competition and impact between foreign banks and other non-listed banks, the average annual return on assets of listed banks is constantly adjusting and seeking progress while maintaining stability, which has a positive significance for economic growth.

Control variables

Based on the operability of existing literature data and research conclusions, the control variables selected in this paper are as follows: (1) Total assets (the natural logarithm of total assets is taken, that is, the main purpose is to reduce the absolute value of the data for easy calculation, so as to reduce the scale difference); (2) Loan size, expressed by the Volume of credit (the ratio of the loan balance to total assets); (3) The loan-to-deposit ratio, expressed by ldrs (the ratio of loan balance to deposit balance); (4) Cost-income ratio, expressed by Cost income ratio (the ratio of business and administrative expenses

ISSN 2616-5902 Vol. 6, Issue 5: 8-14, DOI: 10.25236/AJBM.2024.060502

and other expenses to operating income).

Sample selection

Considering the comprehensiveness and fairness of the data, due to the impact of the epidemic in 2020, the relevant data of listed banks in 2020 were excluded. The sample in this paper is the relevant operating data of 54 listed banks in China from 2013 to 2019. In 2020, China's total listed banks included 15 A+H share listed banks, 23 pure A-share listed banks, and 16 pure H share listed banks. Among them, the 54 listed banks include six state-owned big banks: Industrial and Commercial Bank of China, Construction Bank, Bank of China, Bank of Communications, Agricultural Bank, Postal Savings Bank; 10 joint-stock banks: China Merchants Bank, Minsheng Bank, China CITIC Bank, Zheshang Bank, Everbright Bank, Shanghai Pudong Development Bank, Industrial Bank, Huaxia Bank, Ping An Bank, Bohai Bank; City commercial bank 28: Bank of Beijing, Bank of Shanghai, Bank of Jiangsu, Bank of Nanjing, Bank of Ningbo, Bank of Huishang, Bank of Shengjing, Bank of Hangzhou, Bank of Jinzhou, Bank of Tianjin, Bank of Zhongyuan, Bank of Harbin, Bank of Changsha, Bank of Guiyang, Bank of Chengdu, Bank of Zhengzhou, Bank of Chongqing, Bank of Jiangxi, Bank of Guizhou, Bank of Gansu, Bank of Qingdao, Bank of Jiujiang, Bank of Suzhou, Bank of Xi 'an Xiamen Bank, Weihai Bank, Jinshang Bank, Luzhou Bank; And 10 rural commercial banks: Chongqing Rural Commercial Bank, Jiangyin Rural Commercial Bank, Wuxi Rural Commercial Bank, Guangzhou Rural Commercial Bank, Changshu Rural commercial Bank, Suzhou Rural Commercial Bank, Zhangjiagang Rural Commercial Bank, Qingdao Rural Commercial Bank, Zijin Rural Commercial Bank, Jiutai Rural Commercial Bank. The data sample of 54 listed banks is fully representative. The research data of this paper comes from the Wind database, the public statements of commercial banks, and the annual reports of Oriental Wealth, Guotai Junan, and Flush banks, and is manually sorted and supplemented.

3.2.2. Descriptive statistics

Table 1 mainly shows the descriptive statistical results of multiple variables in the model. From the described results, the standard deviation (sd) of ROA is small, the maximum value is 0.0188, and the difference between the maximum and the minimum standard deviation is obvious, reflecting the overall low level of return on assets of 54 listed banks in China. The standard deviation (sd) of the Intermediate income ratio, which represents financial innovation, is also low, with a maximum value of 0.375 and a minimum value of 0.00478, indicating that the overall financial innovation level of China's 54 listed banks is still relatively low. Among the four control variables analyzed, it is found that the difference between the maximum and minimum standard deviation of loan scale is also relatively large, which also indicates that the overall loan scale of China's 54 listed banks is not large enough, and the strength is not enough, reflecting the uneven loan scale of listed banks, so the structure of loan scale should be adjusted as soon as possible. However, the variation of the data of the other three control variables is not large, which can play a good role in the control variables.

Table 1: Descriptive statistics of variables.

	(1)	(2)	(3)	(4)	(5)
VARIABLES	N	mean	sd	min	max
code	378	27.50	15.61	1	54
year	378	2,016	2.003	2,013	2,019
ROA	378	0.00878	0.00242	-0.00543	0.0188
Intermediateincomeratio	378	0.134	0.0855	0.00478	0.375
Totalassets	378	1.965	0.177	1.544	2.370
Volumeofcredit	378	0.434	0.104	0.000403	0.746
Idrs	378	66.85	13.36	28.67	110.0
Costincomeratio	378	30.54	6.483	12.40	66.47

3.2.3. Model setting

Based on the above data introduction and variable design, this paper establishes a set of multiple regression equation models based on non-equilibrium panel data. Model 1 is the explained variable selected in this paper: ROA (that is, the ratio of net profit to annual total assets), which is used as an indicator to measure bank business performance; Model 2 uses ROE (that is, the ratio of net profit to annual net assets) as an auxiliary explained variable to test the impact of financial innovation on bank business performance.

Model 1:

ISSN 2616-5902 Vol. 6, Issue 5: 8-14, DOI: 10.25236/AJBM.2024.060502

$$\text{ROA} = \beta_0 + \beta_1 * \text{Intermediate income ratio} + \beta_2 * \text{InTotal assets} + \beta_3 * \text{Volume of credit} + \beta_4 * \text{ldrs} + \beta_5 * \text{Cost income ratio} + \epsilon \quad (1)$$

Model 2:

$$\text{ROE} = \beta_0 + \beta_1 * \text{Intermediate income ratio} + \beta_2 * \text{INTotal assets} + \beta_3 * \text{Volume of credit} + \beta_4 * \text{ldrs} + \beta_5 * \text{Cost income ratio} + \epsilon \quad (2)$$

In the model, ROA and ROE, as explained variables of the equation, are used to represent return on assets and return on equity respectively, where β_1, β_2, β_3, β_4, and β_5 is the model parameter, Intermediate income ratio represents intermediate business income, and Intotal assets represent the natural logarithm of total assets. The volume of credit represents the ratio of the loan scale, ldrs represents the ratio of loan to deposit, and the Cost-income ratio represents the ratio of cost to income, which is a function of the random error term.

3.3. Empirical result

According to the mixed regression results in Table 2, the Intermediate income ratio representing the financial innovation variable and all control variables are significant within 10%, indicating that each variable has a significant impact on business performance.

Table 2: Results of multivariate mixed regression.

	(1)
VARIABLES	ROA
Intermediateincomeratio	0.006**
	(2.58)
Total assets	-0.002**
	(-2.06)
Volumeofcredit	0.010***
	(6.38)
Idrs	-0.000***
	(-7.05)
Costincomeratio	-0.000***
	(-5.63)
Constant	0.017***
	(8.67)
Observations	378
R-squared	0.154
F test	0
r2_a	0.142
F	13.52

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Firstly, the Intermediate income ratio, the core explanatory variable representing financial innovation, is considered. The coefficient of this variable is significantly positive, indicating that financial innovation has a positive effect on the operating performance of listed banks. This is consistent with hypothesis H1 proposed above, and contrary to the previous hypothesis H2: financial innovation has a negative impact or no significant impact on the operating performance of listed banks.

Followed by the other 4 control variables. (1) Total assets: The coefficient of the total assets scale is negative, indicating that the increase in assets scale will not promote the improvement of the operating performance of listed banks. (2) Volume of credit: the coefficient of the volume of credit is positive, indicating that when the proportion of loans in assets increases, the operating efficiency of listed banks will increase accordingly. (3) ldrs: the regression coefficient of LDRS is negative, indicating that the higher the ratio, the more loan assets corresponding to liabilities will be, which will greatly reduce the liquidity of banks and increase the liquidity risk, which is not conducive to the safe growth of the operating performance of listed banks. (4) Cost-income ratio: the coefficient of income to cost ratio is negative, indicating that the increase of cost and expense of listed banks will not promote the performance of banks, but will reduce the operating efficiency of banks.

ISSN 2616-5902 Vol. 6, Issue 5: 8-14, DOI: 10.25236/AJBM.2024.060502

3.4. Robustness test

ROE: As another important indicator to measure business performance, ROE reflects the return ability of shareholders' equity and dividend ability. In this paper, ROE will be used for the robustness test. Through the test, as shown in Table 3, ROE as business performance is used for estimation regression, and financial innovation is consistent with ROA as business performance regression, with good significance. By comparison, it has better robustness.

Table 3: Robustness test results.

	(1)
VARIABLES	ROE
Intermediateincomeratio	0.144***
	(4.33)
Total assets	-0.015
	(-0.97)
Volumeofcredit	0.068***
	(2.92)
Idrs	-0.002***
	(-9.07)
Costincomeratio	-0.001***
	(-3.92)
Constant	0.271***
	(8.71)
Observations	378
R-squared	0.210
F test	0
r2_a	0.199
F	19.74

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4. Research conclusions and policy recommendations

4.1. Research conclusions

4.1.1. Financial innovation has effectively improved the operating performance of listed banks

Although financial innovation has a positive effect on the operating performance of listed banks in China, the standard deviation of the intermediary business income ratio of the agent variable of financial innovation ability is low, which indirectly indicates that the financial innovation ability has a weak effect on the operating performance of listed banks in China, the intermediary business income ratio of listed banks is low, and the investment in financial innovation ability is insufficient.

4.1.2. Loan scale plays a significant intermediary role in the impact of financial innovation on the operating performance of listed banks

Listed banks, still mainly rely on loan income to survive and develop, and the diversification level is generally low, which leads to the sensitivity of financial innovation ability to the external environment, especially the regulatory environment, thus limiting the sustainable development of financial innovation.

4.1.3. The loan and deposit efficiency plays a significant intermediary role in the influence of financial innovation on the operating performance of listed banks

The unhealthy expansion of the loan-to-deposit ratio will accumulate excessive non-performing assets for banks, which is likely to lead to a debt storm or even bankruptcy, which is not conducive to the healthy and sustainable development of listed banks.

4.2. Policy suggestions

Combined with the above research, we can put forward some policy recommendations:

ISSN 2616-5902 Vol. 6, Issue 5: 8-14, DOI: 10.25236/AJBM.2024.060502

4.2.1. Commercial banks should further strengthen financial product innovation and services

Listed banks should strengthen the targeted research and development support of innovative products and the development of a new economy, implement precision innovation, focus on high-yield and high-quality intermediate business, broaden the thinking boundary of financial innovation, promote the cooperation between the banking government and enterprises in various aspects, and improve the development of high-quality industrial financial environment. Increase technical and financial support for innovative product research and development, and improve the reward mechanism for product researchers. At the same time, it is very important to improve the service level and skill level of listed banks and improve the working enthusiasm and anti-pressure ability of employees.

4.2.2. Commercial banks should coordinate the resonance ability of financial innovation and credit scale

Large-scale lending will consume an excessive capital adequacy ratio, and with the deepening of China's interest rate liberalization reform, lending spreads are shrinking. Financial innovation should focus on strengthening scientific and technological empowerment, deepening innovation in governance structure, further improving operation and management capabilities, making reasonable use of the refinancing function of the capital market, supplementing capital, and ensuring that its capital adequacy ratio is within a reasonable range, so as to better develop high-quality financial services.

4.2.3. Commercial banks should strengthen financial innovation and credit risk

Listed commercial banks need to continuously strengthen credit review and credit management construction, strengthen the risk awareness of staff and customers, and explain to customers not only the pricing of the product, the term of the product, and the expected return, but also explain to customers in detail all possible risks when selling financial products, so as to effectively protect consumers' right to know[6]. To achieve rationalization of sales, transparency of charges, and risk warning, to strengthen residents' supervision of banks Banks need to pay close attention to the potential risks in the intermediary business and report to the relevant departments promptly if they find anything suspicious, to curb illegal acts from the source and ensure the legal and compliant operation of banks.

References

[1] Xiao, Y. G. (2022). Research on problems and countermeasures of intermediate business development of listed banks in China. Chinese Collective Economy (05), 80-81.
[2] Chen, W. H., Liang, N. (2021). Research on the influence of commercial banks' Operating Performance on stock price volatility. Journal of Dongyue (03), 122-130.
[3] Lu, Z. Y., Ma, H. (2021). Research on the impact of financial technology Innovation on the growth of the Real economy. Scientific Management Research (05), 150-159.
[4] Xu, Y. P. (2021). Research on financial innovation and Wealth management under the background of Internet finance. Accounting Learning (30), 146-148.
[5] Wu, S. (2021). The impact of financial innovation and financial risk on the economy. Western Leather (20), 110-111.
[6] Zhang, J. H. (2019). Analysis of listing status of Chinese commercial banks. China Market (35), 38-39.