The Impact of Internet Finance on the Profitability of Commercial Banks

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Abstract: This paper selects data from 20 commercial banks in 2008-2019 to analyze the impact of Internet finance on the profitability of traditional commercial banks. The result shows that Internet finance has a significant negative impact on the profitability of commercial banks. And through the study, it is found that Internet finance mainly affects the profitability of non-state banks. With the Internet finance occupying the financial market, the traditional commercial banks must reexamine themselves and take positive measures to reduce the negative impact. In addition, the risk of commercial banks will also have a significant negative impact on their own development.

1. Introduction

With the rapid development of Internet and the progress of communication technology, Internet finance has gradually emerged in China. Many Internet enterprises take advantage of the convenience of e-commerce platform, rapid and accurate data collection, and the capacity of analysis to enter the financial industry. The traditional commercial banks are special enterprises in our country and play an indispensable role in a country's finance and economic system. Commercial banks can help the country to achieve macro-economic regulation, and are conducive to the sustainable development of the national economy. At the same time, commercial banks also raise and allocate funds for China's economic construction, which are the tie for the smooth progress of social reproduction. At present, commercial banks are facing an unprecedented crisis under the impact of Internet finance. With the increase of Internet users, commercial banks' customers are more and more dependent on Internet finance. If the problem can't be effectively solved, the traditional commercial banks will become more and more passive, which is very adverse to the economic development of a country. Therefore, it is necessary to study the impact of Internet finance on commercial banks, and to propose appropriate coping strategies of commercial banks to enhance their competitiveness.

2. Internet finance overview

2.1 Definition

At present, the industry has not yet reached a unified and comprehensive consensus on Internet finance. An existing recognition of Internet finance is a new type of finance based on payments, big data, social networks, and search engines to realize financial services, payments, and information intermediation. The development of Internet finance has gone through multiple stages such as online banking, third-party payments, personal loans, and corporate financing, and has gradually penetrated into the core of traditional financial services in terms of financing funds and matching of supply and demand of funds.

2.2 The operation model of Internet finance

First, peer-to-peer micro-credit loan(P2P). P2P is a micro-credit loan on the Internet, a business model that gathers very small amounts of funds to lend to people in need of funds. At present, China's P2P has changed from an individual-to-individual small loan to a model in which enterprises in a broad sense also serve as financing parties. P2P platforms are currently the fastest-growing field of Internet finance. SME investors have scarce investment channels. The current investment channels

are concentrated in real estate, stock markets, deposits and wealth management products, and the returns are low. Furthermore, the financing needs of small and micro enterprises in China are far from being met, and traditional commercial banks have failed to serve these small and micro enterprises from a cost perspective. The penetration of the Internet has driven netizens to use the Internet platform for investment and financial management.

Second, crowdfunding. Crowdfunding refers to connecting promoters and investors through the Internet platform to complete the target amount of funds raised by the project initiator in a certain period of time. Crowdfunding uses the spread of the Internet to allow small businesses, artists, and individuals to showcase their creativity to the public, gain public attention and support, and obtain the financial assistance. Compared with the traditional financing method, crowdfunding is more open, and the availability of funds is no longer the sole criterion for the commercial value of the project. As long as the public likes it, they can get the first funding for the project, which provides unlimited possibilities for more small businesses or creative people.

Third, financial online sales. Financial online sales are the online sales of financial products. At present, China's financial online marketing platform has a wide variety of products, which can provide customers with a diversified product portfolio and wealth management solutions; platform entry forms include mobile phone apps, WeChat accounts, etc.; product design is customer-centric, integrated into customer scenarios to provide added value service, breaking the original form of financial products; the breadth of customer service is gradually widening.

Fourth, third-party payments. At present, there are two operation models of third-party payment companies in the market. One is an independent third-party payment model, which is completely independent of e-commerce websites and does not bear guarantee functions. Another third-party payment model provides guarantee functions such as Alipay. Third-party payment companies mainly have income from transaction fees, industry user funds, credit interest, and service fee income.

3. Empirical analysis

3.1 Model setting

This paper uses panel data to study the impact of Internet finance on the profitability of commercial banks, and establishes the following model:

$$NPMS_{it} = \alpha + \beta_1 IFD_{it} + \beta_2 CAR_{it} + \beta_3 NPL_{it} + \beta_4 NIM_{it} + \beta_5 NII_{it} + \varepsilon_{it}$$

Explained variable *NPMS* represents Net Profit Margin on Sales, explanatory variable *IFD* represents Internet Finance Development, *it* represents different banks and years, β represents variable coefficients, ε represents regression residual. Other explanatory variables are shown in the table 1 below.

3.2 Variable selection

Based on the completeness of the data, this paper selects the data of 20 commercial banks from 2008 to 2019 as a sample, including net sales margin, non-performing loan ratio, capital adequacy ratio, net interest margin, and non-interest income. The data comes from the Wind database and regular reports on the banks' official websites.

3.2.1 Selection of explained variable.

The main financial indicators of corporate profitability are net profit margin on sales and asset margin. The explanatory variables and control variables selected in this paper are flows. The assetmargin is the combination of the income statement and the balance sheet, that is, the combination of flows and stocks. The net profit margin on sales is the concept of flow. Therefore, this article chooses the net profit margin on sales as the profit indicator.

3.2.2 Selection of explanatory variable.

The main operating modes of Internet finance are: crowdfunding, third-party payment, and P2P online lending. In China, compared with third-party payments and P2P online lending, crowdfunding

appeared relatively late and the scale was small. Therefore, this article uses the sum of third-party payment and P2P online loan size divided by asset size as the proxy variable for the development of Internet finance

3.2.3 Selection of control variables.

In addition to the development of Internet finance, there are other factors that will affect the profitability of commercial banks. Therefore, in addition to the degree of Internet development, this paper also selects non-performing loan ratio, capital adequacy ratio, net interest margin and non-interest income as control variables. Non-performing loan ratio and capital adequacy ratio are two important indicators to measure the bank's risk level. The reasonable capital adequacy ratio and non-performing loan ratio are also critical to the profitability of commercial banks. The net interest margin, as the ratio of the bank's net interest income to the bank's total interest-generating assets, will also affect the net profit margin on sales. Finally, non-interest income is the operating income of commercial banks in addition to interest margin income, mainly comes from activities such as intermediate business income and consulting investment, which is very important for the profitability of commercial banks.

Table.1. Variable Definitions

	variable name	symbol
explained variable	net profit margin on sales	NPMS
explanatory variable	Internet finance development	IFD
control variables	Capital adequacy ratio	CAR
	non-performing loan ratio	NPL
	net interest margin	NIM
	non-interest income	NII

3.3 Descriptive statistics of sample data

Table 2 provides a descriptive analysis of each variable. From this table, it can be seen that the average development degree of Internet finance is 6.895174, and the gap between the maximum and minimum values is large, indicating that Internet finance has developed rapidly in the past decade. The average net profit margin on sales is 36.27038, the maximum value is 47.77, and the standard deviation is 5.983979. At the same time, by observing the data characteristics of the net profit margin on sales, the profit level of the commercial bank is relatively stable and fluctuates slightly. The standard deviations of non-performing loan ratio and capital adequacy ratio of commercial banks are 0.80909464 and 1.865243, respectively, and the average values are 1.281433 and 12.52404, indicating that banks control risks at a reasonable level. The average non-interest income is 20.9507, and from the trend of data, non-interest income has gradually shown an upward trend in the past ten years.

Table.2. Statistical Description

variable	Mean	Std. Dev.	Minimum	Maximum
NPMS	36.27038	5.983979	4.23	47.77
IFD	6.895174	13.55778	0.028832	70.68093
CAR	12.52404	1.865243	8.58	24.12
NPL	1.281433	0.809464	0.38	9.81
NIM	2.528691	0.525448	1.5	5.3865
NII	20.9507	9.253636	-5.344	51.09

3.4 Empirical results and analysis

This paper uses *stata16.0* software to analyze the panel data. First of all, this paper uses LLC and IPS to perform data stability test. It should be noted that the trend of the data should be used to determine whether the time trend needs to be added. It is concluded that the data is stable through

these two methods. Secondly, the paper conducts Hausman test on the model and finds that the P value is less than 0.05, so the model should use a fixed effect model.

Model 1 is using the selected 20 commercial banks for regression analysis to obtain the influence of Internet finance on the profitability of the overall commercial banks. Through the regression results, it can be concluded that Internet finance has a significant negative impact on the profitability of the overall commercial banks, that is, with the rapid development of Internet finance, it will have a certain negative impact on the profitability of commercial banks. In addition, the risk level of commercial banks also has a significant impact on profitability, asset adequacy ratio has a significant positive effect on commercial banks, and non-performing asset ratio has a significant negative effect on commercial banks. In other words, the more asset adequacy ratio a commercial bank has, the less non-performing loans it has, the lower the risk for a commercial bank, and the stronger its ability to create wealth.

Model 2 deletes relevant data of state-owned banks and performs regression analysis again. It can be seen from the regression results that the conclusions are basically the same as the model 1, indicating that the state-owned banks have a weaker influence on the results. At the same time, it can be seen from the regression results of Model 3 that the impact of Internet finance on the profitability of state-owned banks is not statistically significant. The main reason for this phenomenon is that state-owned banks are subject to stricter supervision by the state, their operating models and profit models are affected by relevant state policies, and state-owned banks have strong funds and a large number of customers. Therefore, state-owned commercial banks temporarily have strong defense capabilities.

It is worth noting that all three models show that no matter what type of commercial bank, the non-performing loan ratio has a significant negative impact on profitability. The bad loan rate needs to accrue bad debts, which will affect bank profits. And the non-performing loan ratio will take up the amount of commercial bank loans. If there are too many non-performing loans, it will affect the bank's ability to lend, and many good projects may not be supported by loans. Therefore, the NPL ratio has a negative correlation effect on the profitability of commercial banks. What is more serious is that if the non-performing loan ratio is too high, banks may be bankrupted.

The capital adequacy ratio, as an important indicator of the supervision of commercial banks by the supervisory authority, can ensure the safety of commercial banks and therefore improve their own operating efficiency. Empirical results show that the capital adequacy ratio has a negative impact on the profitability of state-owned commercial banks, which means that a higher capital adequacy ratio will limit its development, but it is not statistically significant. But for other commercial banks, the capital adequacy ratio has a significant positive impact on profitability. This is because state-owned commercial banks have a greater impact on the country's economy and are subject to stricter regulations, but higher capital adequacy ratios will limit their development. For other commercial banks, a higher capital adequacy ratio can reduce operating risks, improve business efficiency, and increase profitability.

Table.3. Regression Results

	Model 1	Model 2	Model 3
IFD	-0.133***	-0.0963***	0.499
CAR	0.727***	0.749***	-0.180
NPL	-2.620***	-2.220***	-4.724***
NIM	-1.553*	-1.489	-3.135***
NII	-0.122**	-0.144**	-0.144
_cons	37.93*	37.70***	58.47***
Adj_R^2	0.2733	0.3953	0.7797

According to the regression results, we can know that Internet finance has a significant negative impact on the profitability of overall commercial banks. The reasons for this phenomenon are explained below:

First, the operation mode of Internet finance enables its customers to be free from time and geographical restrictions. It is more flexible and convenient to find the required financial resources and expected financial products on the Internet and quickly match each other. This mode is more efficient and reduces information symmetry. At the same time, the supply and demand sides of funds can complete information matching, information screening, capital pricing and transactions on this open platform. There are no traditional financial intermediaries, no high transaction costs, and no monopoly profits.

In addition, Internet financial customers are mainly small and micro enterprises, covering the blind areas of financial services that traditional commercial banks cannot consider. Internet finance mainly serves customers who need to diversify small funds. For these customers, various types of demand are relatively strong, but banks are reluctant to provide their corresponding services. Internet finance has seen tremendous room for development. For example, when buyers and sellers cannot contact each other face-to-face and cannot judge product quality in a timely manner, third-party payment companies provide guarantee settlement services. The nature of this service is not fundamentally different from banks' letters of credit and other services. Banks are fully capable of supporting such businesses without obstacles. However, after comparing costs and benefits, this decentralized small number of online economic transactions is not very attractive to commercial banks.

Finally, the ability of Internet finance to control customer demand also has unique advantages. Internet finance has search engines, big data, social networks and cloud computing. These advantages enable Internet financial markets to reorganize fragmented information and develop products based on fragmented information. Traditional commercial banks have realized the benefits of the big data era, and have taken a series of measures to take full advantage of big data to serve them, such as open online banking. But compared with Internet finance, the ability to collect and process users' information is far from enough.

4. Conclusion and suggestions

Internet finance is a relatively new financial model that relies on fast-growing Internet technologies. It has innovative strength and breakthroughs in transaction costs, transaction time and scope, transaction speed and efficiency. These advantages have a certain impact on traditional commercial banks. However, this does not mean that Internet finance has a complete advantage in competition with traditional finance, which dwarfs traditional commercial banks. The Internet itself is a double-edged sword. It has its good side, but also has corresponding defects and loopholes:

(1) The main disadvantage of Internet finance is that the scale of asset is much smaller than that of traditional commercial banks, and network security and risk supervision are still relatively blank. Traditional commercial banks have their own complete risk control systems and internal and external monitoring mechanisms, which can effectively avoid their own risks. (2). From the emergence of traditional commercial banks to their current level, after experiencing many financial crises and various trials, their understanding of many businesses has matured. This is exactly the disadvantage of Internet finance. (3) The most important thing is that Commercial banks, as credit intermediaries, are important pillars of the country's economic development. They will conduct detailed due diligence and review their eligibility to ensure the security of fund transfers and minimize credit risk.

On the other hand, it is undeniable that Internet finance brings both opportunities and challenges to traditional commercial banks, and commercial banks must pay sufficient attention:

(1) Traditional commercial banks must first accelerate their Internet processes and achieve diversification and virtualization as soon as possible. (2) With the development of Internet finance, user experience has become the focus of all Internet products. Banks should simplify procedures, optimize service processes, reduce customer transaction costs, and implement fast and convenient services. On the other hand, it is necessary to be able to track and communicate with customers in a timely manner to improve service quality. (3) Commercial banks cannot ignore Internet companies. They must work closely with Internet companies to learn from each other, use the advantages of the Internet to adapt to the era of big data, and use big data to maintain customers and design personalized

products for customers. (4) Commercial banks should use consumption data to expand their business and expand consumer credit. (5) Under the pressure of the economic downturn, commercial banks cannot cooperate only with large enterprises. By working with Internet companies, they must minimize the cost of developing small customers and gradually finance more small and micro businesses. (6) Talent is a key factor in industrial development. In the context of Internet finance, commercial banks need to improve the enthusiasm and comprehensive quality of employees, conduct regular training to form healthy competition, and pay more attention to compound talents when recruiting.

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