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A Research on the Impact of Market Structure on Deposit and Loan Pricing Using Financial Technology Innovation Pricing Model

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Zhigang Zhou*
School of Economics
Wuhan Business University
Wuhan, Hubei Province, China
zgzhou@foxmail.com

Shengyang Yan
School of Economics
Wuhan Business University
Wuhan, Hubei Province, China
71363894@qq.com

Xiaodan Wan*
College of Business
Universiti Utara Malaysia
Sintok, Malaysia
wan_xiaodan@cob.uum.edu.my

Abstract

The pricing of commercial bank deposits and loans is a key link in optimizing the allocation of credit resources through the price mechanism by means of indirect financing. Under the background of the rapid development of financial technology, the mechanism of commercial bank deposit and loan pricing becomes much more complicated. On the one hand, the changes in the market structure and competitive landscape of China's banking industry are bound to change the pricing behavior of commercial banks. On the other hand, financial technology innovation will have a significant impact on deposit and loan pricing at both the micro and meso industry levels. On the basis of theoretical analysis, this paper constructs a financial technology innovation pricing model and conducts empirical research. It is found that not only is there a significant direct correlation between market structure and financial technology innovation with the pricing of commercial bank deposits and loans, but the market structure pathway is also a key indirect mechanism affecting the pricing of commercial bank deposits and loans. Variables such as financial technology innovation, risk-taking, equity capital, benchmark interest rates, and actual output all have indirect effects on the pricing ability of commercial bank deposits and loans through the market structure pathway. This provides evidence support and feasible suggestions for further optimizing the market structure, promoting financial technology innovation, and improving the efficiency of deposit and loan pricing in China's commercial banking industry.

CCS Concepts

• **Social and professional topics** → Professional topics; Computing and business; Economic impact.

Keywords

Financial Technology Innovation, Pricing Model, Deposit and Loan Pricing, Market Structure, Commercial Bank

*Corresponding author.

1 Introduction

In recent years, with the relaxation of deposit interest rate control and the implementation of loan LPR pricing mechanism, the marketization level of China's commercial bank deposit and loan pricing has been continuously improved. On the one hand, the internal competition in the banking industry has intensified; on the other hand, new financial formats such as Internet finance, mobile payment, industrial chain finance, consumer finance and blockchain finance have sprung up, and external competitors have begun to set foot in traditional commercial banking business with the help of financial technology innovation, therefore, the deposit loan interest margin of commercial banks has gradually narrowed. The banking industry of major economies is mostly in a "monopoly competition" market pattern, and commercial banks will more or less rely on the market power formed by the market structure to gain pricing advantages in the deposit and loan market. The changes in the competitive landscape of modern commercial banks and the evolution of financial technology innovation are bound to have a significant impact on the pricing mechanism of commercial bank deposits and loans. Since 2000, the market share of large state-owned commercial banks in China has been continuously declining, while numerous small and medium-sized commercial banks have emerged, resulting in a continuous decrease in market concentration of commercial banks.[1] Will changes in market structure affect the pricing of deposits and loans in Chinese commercial banks? This issue still requires in-depth theoretical and empirical research. At the same time, financial technology innovation is constantly emerging, and its impact on the structure of the banking market and the pricing of deposits and loans cannot be ignored. However, the impact of financial technology innovation on the pricing of commercial bank deposits and loans has a dual nature: on the one hand, financial technology innovation improves operational efficiency, expands funding sources, reduces transaction costs, and is conducive to enhancing the pricing capability of commercial banks; on the other hand, the internal changes and external competition brought about by financial technology innovation may alter the banking market structure, which will intensify price competition in the deposit and

loan markets. Therefore, in the context of rapid development of financial technology, examining the correlation between market structure and commercial bank deposit and loan pricing cannot ignore the impact of financial technology innovation, nor can it only conduct theoretical qualitative analysis. Further empirical quantitative analysis is needed. This paper starts with the market structure of the banking industry, constructs a deposit and loan pricing model that includes financial technology innovation for empirical research, and attempts to explore the above issues.

The Market Power (MP) theory based on the framework of industrial organization economics and micro analysis of financial intermediaries suggests that the pricing behavior of commercial banks is closely related to market structure. Commercial banks gain market power through market structure and have the ability to influence prices. Berger et al. subdivided the MP theory into the "Structure-Conduct-Performance" (SCP) hypothesis and the Relative Market Power (RMP) hypothesis.[2, 3] The SCP paradigm holds that the level of market concentration in the commercial banking industry determines the market behavior of commercial banks; commercial banks with monopolistic positions tend to control the prices of financial services or products through collusion, unfair competition, and political lobbying, setting high entry barriers for the banking industry to restrict effective market competition and obtain excess profits. Therefore, the SCP theory suggests that market concentration determines the pricing of deposits and loans for commercial banks by influencing their market behavior. The RMP theory has revised the SCP analysis paradigm based on the study of the impact of market share on the performance of commercial banks. Researchers who support the RMP theory believe that market concentration is not the fundamental determinant of commercial bank performance, and large commercial banks cannot arbitrarily set monopoly prices within the industry; commercial banks can only have an impact on prices and generate excess profits by gaining a high market share.[4]

Due to the correlation between deposit and loan interest rates and the base interest rate, existing research on the pricing of commercial bank deposits and loans generally focuses on the net interest margin. Ho et al. (1981) conducted fundamental research on deposit and loan pricing and proposed the H-S market maker model: banks act as intermediaries in the credit market, determining the optimal net interest margin based on the supply-demand elasticity, risk premium, risk preference, and business scale of deposits and loans.[5] Subsequent researchers further investigated the impact of other factors, such as operating costs, non interest businesses, market structure, ownership structure, asset size, diversified operations, interest rate controls, and financial liberalization, on the pricing of bank deposits and loans based on the H-S pricing model. Among them, the M-S model proposed by Maudos et al. (2009) comprehensively analyzed the impact of factors such as operating costs, credit risk, interest rate risk, and intermediary business on the net interest margin of banks, which has been recognized by domestic commercial bank researchers and has become one of the standard models widely used in relevant empirical research.[6] In the empirical research on the pricing of deposits and loans in Chinese commercial banks, Liu Mingkang et al. (2018) pointed out the endogeneity of bank deposit and loan interest rates based on the experience of interest rate marketization in China, proposed a

corresponding FTP pricing model, and conducted empirical analysis.[7] Some researchers have pointed out that the concentration of the banking industry may be an important factor affecting interest rate pricing when analyzing the transmission efficiency between FTP and commercial bank interest rates.[8, 9]

In summary, although existing research on the pricing of commercial bank deposits and loans is relatively abundant, there exist differences in the mechanism of market structure's impact on prices; previous studies have not yet identified financial technology innovation as an important factor affecting the pricing of commercial bank deposits and loans, as well as the market structure of the banking industry.

In this paper, a new pricing model has built to study the correlations of commercial bank deposit and loan pricing between market structure and financial technology innovation and the main contributions are:

- A financial technology innovation pricing model has been constructed for commercial bank deposit and loan pricing, which is not limited to specific pricing function forms, has microeconomic pricing foundations and can avoid the introduction of false variables by non-parametric testing methods.
- Besides market structure, financial technology innovation is regarded as an important explanatory variable for banking deposit and loan pricing and market structures, and the impacting mechanisms have been theoretically analyzed and empirically verified.
- Based on the new pricing model, both direct impaction and indirect effect of market structure on commercial bank pricing have been confirmed: not only is there a significant direct correlation between market structure and financial technology innovation with the pricing of commercial bank deposits and loans, but the market structure pathway is also a key indirect mechanism affecting the pricing of commercial bank deposits and loans.

2 Theoretical analysis and research hypotheses

2.1 Direct impact

The direct impact of market structure on the pricing of commercial bank deposits and loans has two theoretical mechanisms. Firstly, the market structure of the commercial banking industry can lead to a monopoly competition industry pattern, which will encourage commercial banks to use the market power granted by the market structure to adopt business behaviors different from those in a perfectly competitive market, by lowering deposit interest rates and increasing loan interest rates to obtain the maximum net interest margin as much as possible, thereby obtaining excess profits; The commercial banking industry will exhibit obvious characteristics such as high market concentration, high entry barriers, limited competition, collusion among banking institutions, and industry protection. In a situation where such mechanisms dominate, market concentration is a key variable affecting the pricing of commercial bank deposits and loans. Secondly, individual commercial banks focus on increasing their asset size in order to gain a higher market share, leveraging economies of scale and scope to gain competitive advantages in terms of funding costs and loan pricing, thereby having a substantial impact on deposit and loan pricing. Therefore,

under this mechanism, market share will become the decisive variable determining the pricing of commercial bank deposits and loans. Market share is a linear vector of market structure, while market concentration is a quadratic function of market share. However, both market concentration and market share are variables that describe the market structure of the commercial banking industry. Based on the above analysis, this article proposes hypothesis 1:

H1: Market structure has a positive impact on the pricing of commercial bank deposits and loans.

2.2 The impact of factors including financial technology innovation

In addition to market structure variables, other factors may also have a significant impact on the pricing of commercial bank deposits and loans. With the widespread application of financial technology in modern commercial banks, the impact of financial technology innovation on deposit and loan pricing has become prominent. Firstly, the new financial services and products generated by financial technology innovation can reduce the cost of loanable funds for commercial banks. Secondly, financial technology innovation can achieve differentiated and precise pricing on the credit product side, and provide more comprehensive risk pricing models. In addition, the new technologies, processes, and models generated by financial technology innovation have low marginal usage costs and economies of scale, which can significantly improve the operational efficiency of commercial banks, save management costs, and enhance the price competitiveness of the deposit and loan market. These mechanisms will be beneficial for commercial banks to enhance their pricing ability for deposits and loans at the micro-operational level and increase net income. Although financial technology innovation is beneficial in enhancing the pricing power of commercial banks in the above aspects, on the other hand, the industry changes and fierce external competition brought about by financial technology innovation will force commercial banks to engage in price wars at both ends of the deposit and loan markets, thereby reducing the net interest margin. The overall impact effect still needs to be empirically analyzed and quantitatively tested.

In addition, according to classic deposit and loan pricing models such as cost-plus pricing, LEAD and CPA, variables such as risk management, cost efficiency, and asset size are also important factors affecting pricing. The pricing of deposits and loans in the commercial banking industry, which is cyclical, is inevitably influenced by fluctuations in the real economy cycle and changes in monetary policy.

Based on the above analysis, this article proposes hypothesis 2:

H2: Financial technology innovation has a significant impact on the pricing of commercial bank deposits and loans, but its effect is dual, and the overall direction of the impact needs to be determined through empirical testing.

2.3 Indirect impact

Market structure variables may not only have a significant direct impact on the pricing of commercial bank deposits and loans, but also serve as indirect pathways through which other factors affect deposit and loan pricing. Financial technology innovation may not

only have a direct impact on the pricing of commercial bank deposits and loans at the micro level, but also have a significant impact on the market structure of the banking industry. The innovation of financial technology has brought about online banking, mobile payments, remote customer service, and intelligent applications, which have made up for the lack of physical branches in small and medium-sized banks, expanded the channels for obtaining funds and credit operations, enhanced the competitiveness of small and medium-sized commercial banks, and may also introduce external competition in the traditional deposit and loan business field. This will inevitably weaken the market concentration of the banking industry, reduce the market share of large commercial banks, and change the overall market structure and industrial pattern of the banking industry. This indicates that financial technology innovation not only has a direct micro impact, but also has a secondary impact on deposit and loan pricing through the indirect pathway of market structure. Based on the above analysis, Hypothesis 3 is proposed:

H3: In addition to having a significant direct impact, market structure is also an indirect pathway through which other variables, such as financial technology innovation, may have a secondary impact on deposit and loan pricing.

3 Research Design

3.1 Model construction

Due to the endogenous correlation between deposit interest rates and loan interest rates, net interest margin is usually used as a proxy variable when analyzing bank deposit and loan pricing.[10] The relevant pricing models are generally extended on the basis of the H-S model, based on deposit interest rates and money market interest rates, to examine the impact of market structure, credit risk, risk preference, and asset size on net interest margin, and to conduct markup pricing. More systematic models such as the M-S model further investigate the impact of operating costs and intermediary business on the pricing of commercial bank deposits and loans. Based on these deposit and loan pricing models, this paper introduces financial technology innovation variables, which can be represented by the following generalized function to represent the net interest margin of commercial banks:

$$\text{INTMAR} = f\left(\alpha/\beta, \text{TC}, \text{C}, \sigma, \text{A}, \text{X}\right)$$

$$\text{INTMAR} = f\left(\alpha/\beta, \text{TC}, \text{C}, \sigma, \text{A}, \text{X}\right) \tag{1}$$

Among which, α/β, TC, C, σ, A, and X represent market structure variables, financial technology innovation, cost and expense, risk vector, asset or transaction size, and other macro vectors, respectively. According to the theoretical analysis above, market structure variables can directly affect bank pricing behavior and strategies at the meso industry level. Financial technology innovation TC can improve operational efficiency, reduce transaction costs, and directly affect the net interest margin of commercial banks. By Taylor expansion of equation 1) and taking a first-order approximation, we can obtain:

$$\text{INTMAR} = f_0 + \frac{\partial f}{\partial \text{TC}}\Big|_0 \text{TC} + \frac{\partial f}{\partial \text{C}}\Big|_0 \text{C} + \frac{\partial f}{\partial \alpha/\beta}\Big|_0 \frac{\alpha}{\beta} + \left(\frac{\partial f}{\partial \ln \text{A}} \text{A}\right)\Big|_0 \ln \text{A} +$$

$$\text{INTMAR} = f_0 + \frac{\partial f}{\partial TC}|_0 TC + \frac{\partial f}{\partial C}|_0 C$$

$$+\frac{\partial f}{\partial \alpha/_{\beta}}|_0 \frac{\alpha}{\beta} + \left(\frac{\partial f}{\partial \ln A} A\right)|_0 \ln A + \sum_i \frac{\partial f}{\partial Xi}|_0 Xi \quad (2)$$

For commercial banks, since the net interest margin value generally does not exceed the range of [0, 0.05], and function (1) and its first-order partial derivatives are usually nonlinear functions, if ratio indicators are also used for each proxy variable, the problem of multicollinearity can be avoided while ensuring estimation accuracy in regression analysis of equation 2). The Model based on equation 2) is not limited to specific pricing function forms, also has microeconomic pricing foundations, avoiding the introduction of false variables by non-parametric testing methods, therefore, can be used for transforming nonlinear pricing models into linear approximation models that are easy to empirically test. Based on the above formula, the correlation between the net interest margin of commercial banks and market structure variables (MKTSTR) and financial technology innovation (TC) can be tested. The cost to income ratio (CIR), impairment loan ratio of bank credit (IMPLR), natural logarithm of asset size (lnASSET), equity to asset ratio (EAR), credit market share (MS), benchmark interest rate (BSINT), and real economy output growth rate (GDPGR) are used as proxy variables for cost efficiency, risk premium, market structure, asset structure, and macroeconomic control variables, respectively. The following panel regression model can be obtained:

$$\text{INTMAR}_{it} = \alpha_i + \beta_1 \text{MKTSTR}_{it} + \beta_2 \text{TC}_{it} + \gamma \text{CIR}_{it} + \omega_1 \text{IMPLR}_{it} +$$

$$\omega_2 \ln(\text{ASSET}_{it}) + \omega_3 \text{EAR}_{it} + \mu \text{BSINT}_t + \eta \text{GDPGR}_t + \text{INTMAR}_{it}$$

$$= \alpha_i + \beta_1 \text{MKTSTR}_{it} + \beta_2 \text{TC}_{it} + \gamma \text{CIR}_{it} + \omega_1 \text{IMPLR}_{it} + \omega_2 \ln(\text{ASSET}_{it})$$

$$+\omega_3 \text{EAR}_{it} + \mu \text{BSINT}_t + \eta \text{GDPGR}_t + \text{MKTSTR}_{it} = \alpha_i + \beta \text{TC}_{it} + \gamma \text{CIR}_{it} +$$

$$\omega_1 \text{IMPLR}_{it} + \omega_2 \ln(\text{ASSET}_{it}) + \omega_3 \text{EAR}_{it} + \mu \text{BSINT}_t + \eta \text{GDPGR}_t + \varepsilon_{it} \quad (3)$$

In which, α and ϵ are constant and error terms, respectively, and the subscripts (i, t) of each variable indicate individual commercial banks and time series, respectively.

As the MKTSTR variable is generally measured by market concentration or market share, and its numerical range does not exceed (0,1), by examining the second-order effects of financial technology innovation on deposit and loan pricing through market structure, we can further Taylor expand MKTSTR on TC and obtain the following regression model:

$$\text{MKTSTR}_{it} = \alpha_i + \beta \text{TC}_{it} + \gamma \text{CIR}_{it} + \omega_1 \text{IMPLR}_{it} + \omega_2 \ln(\text{ASSET}_{it})$$

$$+\omega_3 \text{EAR}_{it} + \mu \text{BSINT}_t + \eta \text{GDPGR}_t + V \text{MKTSTR}_{it} = \alpha_i + \beta \text{TC}_{it}$$

$$+\gamma \text{CIR}_{it} + \omega_1 \text{IMPLR}_{it} + \omega_2 \ln(\text{ASSET}_{it}) + \omega_3 \text{EAR}_{it} + \mu \text{BSINT}_t +$$

$$\eta \text{GDPGR}_t + \varepsilon_{it} \text{MKTSTR}_{it} = \alpha_i + \beta \text{TC}_{it} + \gamma \text{CIR}_{it} + \omega_1 \text{IMPLR}_{it}$$

$$+\omega_2 \ln(\text{ASSET}_{it}) + \omega_3 \text{EAR}_{it} + \mu \text{BSINT}_t + \eta \text{GDPGR}_t + \varepsilon_{it} \quad (4)$$

If the estimated coefficients of MKTSTR in model (3) are significant, and TC has a significant impact on MKTSTR in model (4), it can be concluded that market structure is an important pathway through which financial technology innovation has a significant indirect impact on the pricing of commercial bank deposits and loans.

3.2 Data source and variable description

Empirical analysis is based on panel models (3) - (4) for regression analysis, with samples selected from the top 41 Chinese commercial banks with the largest asset size in the Bankscope database from 2006 to 2020. In the modeling, commercial bank operation related data such as INTMAR, CIR, IMPLR, EAR and ASSET are sourced from the Bankscope database, while BSINT and GDPGR are sourced from the official websites of the People's Bank of China and the National Bureau of Statistics. The TC index is measured based on the Malmquist DEA method (Zhou Zhigang et al., 2022), using the intermediary method to calculate the flow index of the bank's income statement.[10] The definitions or calculation methods of all indicator variables are shown in Table 1.

4 Empirical testing and analysis

4.1 Direct impact effect testing

To test the direct impact of market structure and financial technology innovation on the pricing of commercial bank deposits and loans, this paper constructs a panel regression model using equation 3), selects control variables such as INTMAR, CIR, IMPLR, EAR, ASSETBSINT, and GDPGR for regression analysis, and the empirical analysis results are shown in Table 2. The regression results of the market structure variable CONC and the impact of financial technology innovation on deposit and loan pricing are shown in Column (1) and (2) of Table 2, respectively; the third column is the regression result considering the simultaneous effects of market structure and financial technology innovation.

The estimation coefficient of CONC is positive and has passed the significance test at the 5% level, indicating that the strengthening of market concentration will increase the net interest margin and have a direct positive impact on the pricing ability of commercial banks' deposits and loans. Even considering the impact of financial technology innovation, the estimation coefficient of net interest margin by CONC remains almost unchanged, and the positive correlation between market structure and commercial bank deposit and loan pricing still exists significantly. The hypothesis H1 derived from the previous theoretical analysis has been confirmed.

The estimated coefficient of TC is negative and passed the significance test at the 1% or 5% level (see Column (2) and (3) of Table 2). The net interest margin is significantly negatively correlated with financial technology innovation, which directly weakens the pricing power of commercial banks' deposits and loans. This indicates that financial technology innovation is an important factor affecting the pricing of commercial bank deposits and loans. The impact of industry changes and fierce external competition brought about by financial technology innovation exceeds the positive effect of financial technology innovation on the improvement of internal operational efficiency, pricing ability, and risk management of banks. The comprehensive impact effect is negative, and hypothesis H2 is tested.

4.2 Indirect impact effect testing

Based on the theoretical analysis in the previous section, further regression analysis has been conducted on the MS influencing factors of the market structure variable CONC using model (4) to examine

Table 1: Variable Description

Variable	Variable definition
INTMAR	Net interest margin on deposits and loans
CONC	The concentration of the banking market, measured by using the HHI index
MS	Ratio of bank assets to total bank assets
TC	The Financial Technology Innovation Index is measured by using Malmquist DEA method
CIR	Bank cost income ratio
IMPLR	Impairment loan ratio of bank credit business
lnASSET	The natural logarithm of the total assets of the bank (in thousands of RMB)
EAR	Shareholder equity to total assets ratio
BSINT	Annual average benchmark interest rate
GDPGR	Real GDP growth rate

Table 2: Test on the Impact of Market Structure and Financial Technology Innovation on Deposit and Loan Pricing

Variable	(1)	(2)	(3)
CONC	5.235491**		5.753249**
	(2.656673)		(2.631922)
TC		-0.083616**	-0.087488***
		(0.033534)	(0.033364)
CIR	-0.027333***	-0.026571***	-0.027316***
	(0.002997)	(0.002963)	(0.002965)
IMPL	0.012140*	0.014860**	0.013514**
	(0.006379)	(0.006342)	(0.006332)
EAR	0.040708***	0.038978***	0.039972***
	(0.010692)	(0.010639)	(0.010580)
lnASSET	-0.121062	-0.215843**	-0.111874
	(0.102669)	(0.089745)	(0.101622)
BSINT	-0.073298	-0.058075	-0.056431
	(0.045878)	(0.046132)	(0.045836)
DGDP	-0.033664	0.003250	-0.037784
	(0.038541)	(0.033166)	(0.038158)
F-statistic	10.01577***	10.14966***	10.16682***
Adjusted R^2	0.577967	0.581559	0.587022

Note: $***$, $**$, and $*$ represent statistical significance at the 1%, 5%, and 10% levels, respectively; the values in parentheses are the standard deviation of the estimated regression coefficients, the same applies in below tables.

the second-order effects of financial technology innovation and control variables on the pricing of commercial bank deposits and loans through market structure pathways. The results are shown in Table 3, where Column (1) and (2) provide panel regression results under the influence of financial technology innovation and under situations where financial technology innovation cannot be considered. CONC is negatively correlated with TC, and the estimated coefficient is significant at the 1% level; this indicates that financial technology innovation has weakened the concentration of the bank deposit and loan market. According to previous theoretical analysis in 2.3 and results in Table 2, which indicates significant positive correlation between CONC and INTMAR, it is proved that financial technology innovation has indirectly had a negative impact on the pricing of commercial bank deposits and loans through the market concentration pathway. However, the estimation coefficient of TC on MS is not significant, indicating that financial technology innovation cannot effectively change the market share of banks, and the indirect impact on net interest margin is generated through the market concentration mechanism (TC-CONC-INTMAR). In addition, Table 3 shows that the concentration of the banking market is positively correlated with the cost to income ratio CIR, benchmark interest rate BSINT, and actual growth rate DGDP, and negatively correlated with asset size; and market share is positively correlated with EAR, IMPL, and DGDP. This indicates that at the micro level, commercial banks can indirectly enhance their ability to price deposits and loans through market structure by increasing risk-taking, increasing equity capital, and appropriately reducing asset size. At the macro level, actual output growth can significantly increase the market share and market concentration of commercial banks, while the increase in benchmark interest rates will significantly strengthen the market concentration of banks. This indicates that

Table 3: Indirect Impact Effect Test of Market Structure Pathway

Variable	CONC		MS	
	(1)	(2)	(1)	(2)
TC	-0.002751***		2.30E-05	
	(0.001043)		(0.001371)	
CIR	0.000211***	0.000201***	-0.000200*	-0.000199*
	(5.15E-05)	(5.20E-05)	(0.000111)	(0.000111)
IMPL	-0.000172	-0.000179	0.001186***	0.001186***
	(0.000205)	(0.000204)	(0.000221)	(0.000220)
EAR	0.000339	0.000356	0.001396***	0.001396***
	(0.000275)	(0.000276)	(0.000374)	(0.000373)
lnASSET	-0.004991**	-0.004626**	0.005615	0.005609
	(0.002204)	(0.002230)	(0.003815)	(0.003790)
BSINT	0.006215***	0.006105***	-0.000286	-0.000285
	(0.000994)	(0.001004)	(0.001862)	(0.001858)
DGDP	0.010525***	0.010677***	0.008193***	0.008192***
	(0.000861)	(0.000870)	(0.001222	(0.001215)
F-statistic	36.63446***	35.95575***	143.1788***	146.8170***
Adjusted R^2	0.885764	0.851577	0.958565	0.958732

as a cyclical industry, commercial banks' net interest margin on deposits and loans will be indirectly affected by market structure during interest rate hikes and periods of rapid macroeconomic growth.

The above analysis indicates that, based on the regression results in Table 3, hypothesis H3 has been tested.

4.3 Robustness testing and further analysis

According to the regression model (3) and (4), the market structure variables have been replaced with market share MS instead of the benchmark measure CONC used in the benchmark test, and the robustness test results show that the significance of the market structure and fintech innovation variables has not changed, and the estimated coefficients have remained basically unchanged. The results of the benchmark regression analysis are robust. Considering that MS and CONC respectively reflect the market share distribution of individual banks and the industry situation of the entire market, containing different market structure information, and that CONC is a quadratic function with no linear correlation with MS, this paper also uses these two market structure variables for panel regression to further test robustness. In all the three cases, the regression results are basically consistent, once again confirming the robustness of the benchmark regression.

In addition, it can be verified that INTMAR is significantly negatively correlated with CIR and significantly positively correlated with EAR, both passing the significance test at the 1% level. Moreover, the correlation is robust given different market structures and financial technology innovation variables. This indicates that commercial banks can significantly enhance their pricing power for deposits and loans by reducing operating costs and expenses, and increasing their equity capital ratio.

5 conclusion

Based on the pricing model of financial technology innovation, this paper adopts a panel regression model and uses data from 41 representative Chinese commercial banks from 2006 to 2020 as samples to empirically study the relationship between market structure and commercial bank deposit and loan pricing. Firstly, the pricing ability of commercial banks for deposits and loans is significantly positively correlated with market structure. The strengthening of bank market concentration and the increase in market share can have a direct positive impact on the improvement of net interest margin between deposits and loans. This indicates that commercial banks in China still have strong market power and pricing ability in the process of deposit and loan pricing. Market structure variables are still an important factor in determining deposit and loan pricing. Under the given conditions of other economic variables, the net interest margin of banks will narrow as market concentration decreases. Secondly, the pricing ability of commercial banks' deposits and loans is significantly negatively correlated with financial technology innovation. On the one hand, financial technology innovation directly reduces the net interest margin of commercial banks and intensifies competition through price mechanisms; on the other hand, financial technology innovation has reduced the market power of commercial banks through market concentration, further indirectly weakening their pricing ability. Thirdly, in addition to direct impact, market structure is also a key indirect pathway that affects the pricing of commercial bank deposits and loans. Variables such as financial technology innovation, risk-taking, equity capital, benchmark interest rates, and actual output will indirectly affect the pricing ability of commercial banks' deposits and loans through market structure pathways.

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