

Study on The Operating Performance of Banks in China --Based on The Interest Rate Liberalization

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Abstract. This article wants to use panel data to compare the operating performance of commercial banks in China and give some advice. From the beginning of the Reform and opening up, the process of interest rate liberalization has been accelerating in China. Therefore, the panel data of 43 banks from 2009 to 2014 were chosen in this article. This article takes the multiple regression, choose ROA as the explained variable and 2 explaining variables to regress. The result of the regression explains that the interest rate of liberalization will have large effect on the national joint-equity commercial banks and little effect on other banks.

Keywords: Interest rate liberalization, Operating performance, Panel data, Native banks, Foreign banks

1 Introduction

1.1 Research background

Since the establishment of the People's Bank of China in 1948, China's banking industry has gradually formed with Chinese characteristics. After the Reform and opening up, China has taken a number of initiatives to promote the opening of the financial system and the introduction of foreign capital, the domestic banking industry presents a diversified development trend.

With China's accession to the WTO in 2001, foreign banks gradually entered the banking industry. Since 2006, China has fully liberalized RMB business and gradually relived the constraints of foreign banks operating RMB business. By 1990s, with the growing maturity of the banking industry, the central government set up urban commercial banks on the basis of city credit cooperatives. City commercial bank was originally established to provide financial support to local small enterprises.

1.2 Literature review

Richard S. Barr, Kory A. Killgo, Thomas F. Siems and Sheri Zimmel (2002) used the restricted multiplier, input-oriented data envelopment analysis (DEA) model to evaluate the performance of US commercial banks from 1984 to 1998. Yuan Yi, Zhou Ouyang Chuan and Wu Yan (2013) collect the net interest rate of the six commercial banks and the benchmark interest rate of the central bank, draw a comparison of the net interest rate and establish the capital asset pricing model (CAPM) to study the empirical relationship between interest rate volatility and bank profitability.

Claessens, Demirguc-Kunt and Harry Huizinga (2001) through empirical analysis of nearly 8,000 banks in 80 countries in the seven years after 1988, found that the margins and profits of local banks in developing countries were generally less favorable than those of foreign banks. And the improvement of the efficiency of the banking system has benefited from the entry of foreign banks. Meng Lingyu (2013) selected 22 commercial banks' data from 2007 to 2011, to study commercial banks' business performance. The empirical results show that the capital adequacy ratio and the total assets of deposits have positive impact on bank's operating performance.

2 Theoretical Analysis and Hypothesis

2.1 The implementation of the process of interest rate liberalization in China

The central bank opening the interbank interest rate on June 1, 1996, opened the reform of China's interest rate liberalization. Since 1996, China has gradually liberalized the interbank lending rate, bond market interest rates and the issued interest rates of policy financial bonds and unlocked large foreign currency deposit interest rate control. After 2004, the central bank began to expand the floating range of RMB lending rates. From the beginning of 2015 to present, the central bank has cut interest rates for five times, and cut the financial institutions' RMB deposit and lending rates.

2.2 Hypothesis

As the interest rate marketization started late in China, the financial market is not perfect, most of China's commercial banks still depend on deposit and lending spread. However, with the advancement of interest rate marketization aggravating the competition of deposit and loan business, the interest spreads will inevitably shrink. At this time, commercial banks should try to find new profit growing points from the intermediate business. Therefore, this paper proposes the following two hypotheses:

H1: In the process of marketization, the narrowing of the difference in deposit and loan interest rates will bring different extent of impact to all kinds of banks.

H2: Interest rate changes may have less impact on foreign banks, and their business performance may be better than other comparable commercial banks.

3 Research Design

3.1 Sample selection

In order to compare the performance of various types of commercial banks in China, they are divided into four major categories, and the study plans to select 43 banks, including 5 state-owned commercial banks, 9 national joint-stock commercial banks, 14 city commercial banks and 15 foreign banks. The time span of the data to be selected is from 2007 to 2014. However, it is found that the data of foreign banks are not complete in 2007-2009, so the time span is changed from 2009 to 2014.

The data are derived from the Global Bank and Financial Institutional Analysis Database, CSMAR and the official website of the People's Bank of China.

3.2 Variable definition

The chosen variables are listed in the following table.

Table 1 Variable design

Nature	Name	Code	Description
Dependent variable	Return on assets	ROA	ROA=Net profit/Total assets
Independent variables	Non-interest income ratio	NIIR	NIIM=(Operating income-Spread income)/Operating income
	Net interest rate of return	NIM	NIM=Net interest income/Total assets
Control variables	The size of assets	ASSET	Natural logarithmic total assets
	Loan to deposit ratio	LTD	LTD=Total loans/Total deposits
	Deposit and loan spreads	DL	DL=Loan benchmark interest rate -Deposit benchmark interest rate
	Cost to income ratio	COI	COI=Operating cost/Operating income
	Capital adequacy ratio	CAR	CAR=Total assets/Total weighted risk assets

According to the above analysis, ROA is used to measure the performance of commercial banks, regress the selected variables, so it is proposed to establish the following regression model equation:

$$ROA=b_0+b_1NIIR+b_2NIM+b_3ASSET+b_4LTD+b_5DL+b_6COI+b_7CAR$$

3.3 Empirical analysis

By observing the correlation coefficients of the variables, it can be found that the correlation coefficient between independent and control variables are not particularly significant, so the regression model of the panel data is considered effective.

Table 2 Correlation of variables

	ROA	NIIR	NIM	LTD	ASSET	COI	CAR	DL
ROA	1.000							
NIIR	0.076	1.000						
NIM	0.615	-0.469	1.000					
LTD	-0.153	-0.101	0.083	1.000				
ASSET	0.454	0.269	0.139	0.076	1.000			
COI	-0.773	0.106	-0.447	0.258	-0.448	1.000		
CAR	-0.200	0.056	-0.130	0.240	-0.384	0.432	1.000	
DL	-0.167	-0.142	-0.173	0.071	-0.089	0.197	0.011	1.000

In this paper, Stata software is used to analyze the panel data of 43 commercial banks. First, all the data of 43 commercial banks are regressed. After the Hausman test, $Prob > \chi^2 = 0.1558$, which is significant at the 5% level, then I accept the original hypothesis, using the random effect model to regress the four types of commercial banks respectively. The regression results are as follows:

Table 3 Results of regression model

Variables	Total sample	State-owned banks	Joint-stock banks	City banks	Foreign banks
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
C	-0.4424 (-1.08)	-1.1020 (-0.53)	-3.1161** (-2.22)	-0.7164 (-0.82)	1.9809 (0.83)
NIIR	0.0091*** (6.11)	0.0123*** (2.62)	0.0081*** (2.87)	0.0124*** (6.98)	0.0098* (1.73)
NIM	0.3590*** (9.81)	0.3559*** (4.76)	0.4507 (8.27)	0.4078*** (8.79)	0.1218 (0.99)
LTD	-0.0007 (-0.66)	-0.0042 (-1.40)	0.0068* (1.70)	-0.0051*** (-2.67)	-0.0004 (-0.23)
ASSET	0.0157 (1.48)	0.0452 (0.83)	0.0747 (1.51)	0.0144 (0.68)	-0.1457 (-1.59)
COI	-0.0138*** (-8.443)	-0.0321*** (-7.93)	-0.0153*** (-3.98)	-0.0210*** (-8.10)	-0.0118*** (-2.85)
CAR	0.0046 (1.34)	0.0214 (1.36)	-0.0071 (-0.39)	0.0213* (1.88)	-0.0172* (-1.91)
DL	0.1658** (2.35)	0.2805** (2.02)	0.3071** (2.08)	0.3197** (2.07)	0.9346*** (3.40)
R-sq	0.8217	0.9528	0.8454	0.8386	0.8749

*** significant at 1% level,** significant at 5% level,* significant at 10% level.

Then I go on the multi-collinearity test. Through the VIF test of the mixed model, it can be concluded that the VIF of each variable is less than 10, so there can be no obvious multi-collinearity

between the variables.

Table 4 VIF test

Variable	VIF	1/VIF
COI	1.96	0.5101
NIM	1.77	0.5652
ASSET	1.76	0.5684
NIIR	1.68	0.5939
CAR	1.42	0.7063
LTD	1.29	0.7742
DL	1.13	0.8867
Mean VIF	1.57	

3.4 Analysis of regression results

Among them, the regression coefficient of urban commercial banks is the largest, indicating that the effect of NIIR to urban commercial banks is relatively obvious. Compared with the state-owned banks, the listed market of the joint-stock banks was gradually lost, and the scale of assets was not as good as that of state-owned banks, which could not be distinguished from them in terms of business type, service population and service mode.

Secondly, through the coefficient of net interest rate of return(NIM), the coefficient is positive that means the higher the NIM, the higher the ROA, the better the business performance. The coefficient of local banks is significantly greater than foreign banks, the reason mainly is that the main income is still from the deposit and loan interest spreads. So in China's financial markets, local banks should accelerate business model transformation to reduce the dependence on interest income.

It can be seen that the effect of net interest rate of return on ROA is greater than that of non-interest income. We can conclude that commercial banks are mainly based on spread income, and the intermediary business needs to be further developed.

4 Conclusion and suggestions

4.1 Conclusion

To sum up, the gradual deepening of interest rate liberalization will bring a greater impact to the local commercial banks, the impact on foreign banks is small, but joint-stock banks due to the dependence on net interest income is more obvious, so the joint-stock banks will lead to a greater degree of reduction on operating performance. Relatively speaking, state-owned banks and city commercial banks can be through the development of intermediary business to weaken the impact of interest rate marketization.

4.2 Suggestions

For China's domestic commercial banks, the interest rate liberalization reform will undoubtedly cause impact on the banking industry, so there is necessary need to make adjustments and change to adapt to the times and market demand.

Firstly, local commercial banks should consider the transition of profit model, vigorously develop the intermediary business, learn to create innovative internal business environment, cultivate staff's sense of innovation and strive to provide customers with personalized banking business and financial products.

Secondly, commercial banks should always pay attention to control costs, optimize the structure, strengthen the management of cost. Commercial banks should continue to improve risk

management, and strive to enhance the ability to identify risks, analyze risks and manage risks.

Finally, in the process of marketization of interest rates, commercial banks should also be able to predict changes in interest rates, which has a significant effect on the timely and effective response of banks.

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