The Influence of Foreign Equity Participation on the Profitability of Chinese Commercial Banks: Multi-perspective Research Based on Banks, Industry, Macroeconomics

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Abstract:

With the deepening of China's banking industry's opening to the outside world, the influence and penetration of foreign strategic investors in China are gradually increasing. In this context, this paper uses unbalanced panel data of 111 Chinese commercial banks from 1996 to 2017 to analyze the impact of foreign equity participation on the profitability of Chinese commercial banks from multiple perspectives, including banks, industries and macroeconomics. The results show that the profitability of Chinese commercial banks is proportional to the proportion of foreign equity participation. Among multiple variables, variables such as Capital, Credit risk, Operating expenses management, and Inflation expectations have an impact on the profitability of Chinese commercial banks. Through the analysis of different types of banks, The results show that in joint-stock commercial banks and city commercial banks, bank profitability is proportional to the proportion of foreign equity participation.

Keywords: Foreign Investors, Bank profitability, Dynamic panel.

I. INTRODUCTION

Banking has played an important role in the rapid development of China's economy. A review of the reform track and development experience of China's banking industry shows that before 1979, China practiced a highly centralized planned economy and the People's Bank of China was the dominant one. After the reform and opening up, with the adjustment of economic policies, the domestic financial reform began rapidly, and new financial institutions began to be set up. First of all, four state-owned specialized banks were established, and joint-stock banks and city commercial banks were gradually opened. After 1993, the state-owned specialized banks were restructured into large state-owned commercial banks in a planned way, and the reform of shareholding system was actively promoted. At the end of 2001, China joined the World Economic and Trade Organization (WTO) and began to gradually introduce foreign strategic investors to invest in Chinese banks. China promised to fully open foreign banks' access to China's financial market in 2007 and remove relevant restrictions on foreign banks' domestic operations.

This move has accelerated the pace of domestic banking reform. After entering the 21st century, the domestic financial market has achieved unprecedented development, and the reform achievements of China's banking industry have attracted worldwide attention. In 2004, the Chinese government began to implement corporate governance reforms focusing on shareholding system reform and public listing of state-owned banks. Introducing foreign financial institutions to take shares in Chinese banks is one of the important measures.

Yi Gang, governor of the People's Bank of China, announced a number of major measures to open up the financial industry at the 2018 Boao Forum for Asia, including the removal of foreign shareholding ratio restrictions on Chinese banks.t can be seen that the opening of the financial industry is an important part of China's opening to the outside world. It is of great practical significance to correctly understand the influence of the introduction of foreign capital on Chinese commercial banks.

With the determination of the direction of domestic banking reform, the entry of foreign banks into China has always been the focus of the government and the private sector, and has also been a hot topic among academic and practical circles. There are three ways for foreign capital to enter the Chinese banking industry, namely sole proprietorship, joint venture and equity participation. Due to the government's strict review on the way of sole proprietorship and joint venture to enter the market, there are relatively few foreign investors who enter China's banking industry through these two ways. Most investors enter the Chinese banking industry by way of equity participation. However, what impact does the entry of foreign capital have on China's banking industry? Most of the previous literature focused on whether it was helpful to improve the efficiency of domestic banking industry, or discussed the advantages and disadvantages of introducing foreign strategic investments. Studies analyzing the impact of foreign equity participation on bank profitability systematically are rare.

This paper uses unbalanced panel data of 111 Chinese commercial banks from 1996 to 2017 to analyze the impact of foreign equity participation on the profitability of Chinese commercial banks from multiple perspectives, including banks, industries, economic psychology and macroeconomics. The results show that the profitability of Chinese commercial banks is proportional to the proportion of foreign equity participation. Among multiple variables, variables such as Capital, Credit risk, Operating expenses management, and Inflation expectations have an impact on the profitability of Chinese commercial banks. Through the analysis of different types of banks, the results show that in joint-stock commercial banks and city commercial banks, bank profitability is proportional to the proportion of foreign equity participation. Finally, this paper puts forward countermeasures and suggestions: Firstly, actively learn advanced knowledge and technology from overseas financial institutions and establish cooperative partnerships for sustainable development. Secondly, attach great importance to financial stability and implement classified management of foreign capital entering the Chinese banking system.

II. LITERATURE REVIEW

2.1 Literature Review on Determinants of Bank Profitability

In recent decades, with the gradual improvement of the operation mode of commercial banks, many domestic and foreign scholars and experts have conducted research on bank profitability issues. Many valuable literatures have also been produced. Existing research can be divided into the three categories. The first type of research mainly analyzes the internal factors of banks, including bank size [1], bank financial indicators [2], bank equity Structure [3]. The second type of research is based on the financial environment of the host country [5-6], market structure [7] and management of bank profitability and Business cycle relationship [8] and other external factors on bank profitability. The third type of research is the impact of the interaction between internal factors and external factors on bank profitability.

Synthesizing the studies of Smirlock (1985) [9], Demirguc-Kunt and Huizinga (2000) [6], Molyneux and Thornton (1992) [5], Heffernan & Fu (2008) [10], Sufian & Habibullah (2012) [7], Dreher (2006) [11], this paper analyzes the factors affecting bank profitability from the bank's financial characteristics, bank industry concentration and macroeconomic variables.

2.2 Influence of Foreign Equity Participation on Bank Profitability

The banking industry is an important part of the modern financial system. In China's financial system, which mainly focuses on indirect financing, commercial banks play a more important role. With the deepening of China's financial system reform, China's commercial banks have gone through the process of breaking market monopoly, deregulation, optimizing property rights structure, enhancing horizontal competition, encouraging listing, and attracting foreign capital and foreign banks to enter. The market system has become diversified. Commercial banks have gained more financing channels and room for development. Under the new market structure, commercial banks, like ordinary listed companies, have received more attention from market investors and faced more severe market tests. They need to maintain the profitability of banks independently. Effectively evaluating the profitability of Chinese commercial banks and exploring its influencing factors have become a hot topic concerned by the theoretical and practical circles.

In the past literature, there are three aspects to discuss the impact of foreign equity participation on the host country's banks. First, foreign equity participation has a certain effect on the improvement of banking efficiency and the stability of financial system in the host country [12-14]. It is believed that overseas investment institutions usually have rich international management experience, innovative financial products and advanced equipment and technology. After entering the host country market, they will help promote healthy market competition, prompt the host country government to improve the financial environment. Local banks can improve their profitability by learning new technologies from foreign capital. However, other scholars hold a negative reaction view, arguing that the entry of foreign capital may also have a negative impact on the host country. Therefore, the entry of foreign banks will not

significantly improve the profitability of local banks, and it will also cause unnecessary fluctuations in the credit market [15-16]. The third view is that foreign equity participation is not correlated with bank profitability [17]. It can be seen that scholars have different studies on the impact of foreign equity participation on the profitability of Chinese commercial banks.

III. STUDY DESIGN

3.1 Samples and Data Sources

Li, Moshirian, Pham & Zein (2006) [18] stated: "Whether it is a company or a bank, as long as it holds more than 5% of the shares, it will have important rights of major shareholders (the right to be named, that is, the right to convene an emergency interim council) rights, etc.)." Therefore, in this study, when a foreign investor holds more than 5% of a bank's shares, it is defined as foreign equity participation.

This paper takes Chinese commercial banks from 1999 to 2017 as the research sample, excluding samples with missing financial data for three consecutive years and samples with a foreign shareholding ratio of less than 5%, and finally obtains an unbalanced panel data containing 111 commercial banks, including 5 large banks, 11 joint-stock banks, 75 city commercial banks and 20 rural commercial banks. The bank's financial statements come from the Bank scope database, and the corporate governance data such as whether the bank has introduced foreign capital and its shareholding ratio come from the Wind database. If any of the above data is missing, it will be collected through the bank's annual report, google and other news retrieval.

3.2. Variable Selection and Description

3.2.1 Determinants of bank profitability

In general, ROA and ROE are mostly used when considering bank profitability. However, most literatures confirm that ROA is more stable than ROE, and the empirical analysis results also show that the influence degree of ROE is unstable. Therefore, in this study, Only ROA is considered when considering the variables of bank profitability [19]. In order to consider the sustainability of bank earnings, this study uses the ROA value of period t-1 as an explanatory variable when analyzing the impact of foreign shareholding on the profitability of Chinese commercial banks. Table I describes the variables used in this paper.

TABLE I. Definition and description of main variables

Variable		Measure	Notation	Expected effect
Dependent variable	profitability	Net profits before taxes/assets or net profits before taxes/equity	ROA or ROE	
Determinants	Capital	Equity/assets	EA	Positive

Bank-specific	Credit risk	Loan loss provisions/loans	PL	Negative
	Productivity growth	Rate of change in inflation-adjusted gross total revenue/personnel	PR	Positive
	Operating expenses management	Operating expenses/assets	EXP	Negative
	Size	Real assets in logs	S	?
Industry-specific	concentration	Herfindahl-Hirschman index	H-H	?
macroeconomic	Cyclical output	Deviations of actual output from segmented trend	CO	Positive
	Inflation Expectations	Current period inflation rate(consumer prices)or 10-year government bond yield	IE	?
	Foreign equity participation	Foreign shareholding ratio	FP	Positive

3.2.2 Bank-specific profitability determinants

The results of Smirlock (1985) [7], Demirguc-Kunt and Huizinga (2000) [6] show that there is a positive correlation between bank profitability and bank size, while Bikker and Hu (2002) [8] and Goddard et al. (2004) [20] studies show that only the size of small and medium-sized banks affects bank profitability.

Risk management is one of the inherent functions of banks. When the uncertainty of banks increases, financial institutions will reduce risks by diversifying and improving liquidity. The risks referred to here are credit risk and liquidity risk. In Molyneux and Thornton's (1992) [5] study, there is a negative correlation between liquidity and bank profitability, while Bourke's (1989) [4] study shows that there is a positive correlation between credit risk and bank profitability. In addition, Bourke (1989) [4] and Molyneux & Thornton (1992) [5] studies show a positive relationship between bank charges and profitability.

Based on the above literatures and the research of Panayiotis P. Athanasoglou & Sophocles & Matthaios (2008) [20], the bank-level variables in this study are Capital, Credit risk, Productivity growth, Operating expenses management and Size.

3.2.3 Industry-specific profitability determinants

Regarding the relationship between bank profitability and banking market structure (measured by concentration or market share), existing research has formed two completely different hypotheses: the market power hypothesis and the "efficiency structure"(ES) hypothesis .The market power hypothesis can be subdivided into the traditional "Structure-Conduct-profitability" (SCP) hypothesis and the "Relative-Market-Power"(RMP) hypothesis. Based on the research of Eichengreen & Gibson (2001) [21] and Panayiotis P. Athanasoglou & Sophocles & Matthaios (2008) [19], Herfindahl-hirschman index (HH) is used to investigate the market structure of Chinese banking industry in this paper. The Herfindahl-hirschman index is expressed by the formula as follows: $HHI = \sum_{i=1}^{n} (\frac{X_i}{X})^2$, X_i represents the size of enterprise i, X represents the total size of the industry. The higher the HHI value is, the higher the

market concentration degree is. When there is only one enterprise in the market, the HHI value is 1. It is generally believed that if 0.1<HHI<0.18, it means that the market is moderately concentrated; if HHI<0.1, it means that the market is a low-concentration market.

3.2.4 Macroeconomic profitability determinants

Demirguc-Kunt & Huizinga (2000) [6] and Bikker & Hu (2002) [8] tried to find out the relationship between cyclical changes in the economic environment and bank profitability. Although they did not use actual explanatory variables for analysis, they also proposed the possibility of a correlation between bank profitability and cyclical changes in the economic environment. Therefore, based on the above reasons, this paper mainly uses two variables, Cyclical output (CO) and Inflation Expectations (IE), to illustrate the impact on bank profitability in terms of macroeconomics.

3.3 Model Design

In order to analyze the impact of foreign equity participation on the profitability of Chinese commercial banks, this paper analyzes the factors that affect the profitability first. Considering the tendency to persist over time in the profitability of banks, Based on the practices of Berger et al., (2000) [22] and Panayiotis P. Athanasoglou et al., (2008) [19], this paper establishes the following empirical model:

$$Y_{it} = C + \sum_{i=1}^{j} \beta_j X_{it}^{j} + \sum_{l=1}^{L} \beta_l X_{it}^{l} + \sum_{m=1}^{M} \beta_m X_{it}^{m} + \varepsilon_{it}, \quad \varepsilon_{it} = v_i + u_{it} \tag{1}$$

Where Y_{it} is the profitability of bank i at time t with i=1,…N, t=1,…T, c is a constant term, $X_{it}'s$ are the explanatory variables and ε_{it} the disturbance, with v_i the unobserved bank-specific effect and u_{it} the idiosyncratic error. The $X_{it}'s$ are grouped into bank-specific X_{it}^{j}, industry-specific X_{it}^{l}, and macroeconomic variables X_{it}^{m}.

Bank profits show a tendency to persist over time, reflecting impediments to market competition, informational opacity and/or sensitivity to regional/macroeconomic shock to the extent that these are serially correlated. Therefore, we adopt a dynamic specification of the model by including a lagged dependent variable among the regressors. Eq (1) augmented with lagged profitability is:

$$Y_{it} = C + \delta Y_{i,t-1} + \sum_{i=1}^{j} \beta_j X_{it}^{j} + \sum_{l=1}^{L} \beta_l X_{it}^{l} + \sum_{m=1}^{M} \beta_m X_{it}^{m} + \varepsilon_{it}, \tag{2}$$

Where $Y_{i,t-1}$ is the one-period lagged profitability and δ the speed of adjustment to equilibrium.

$$Y_{it} = C + \delta Y_{i,t-1} + \beta_i Foreign_{i,t} + \sum_{i=1}^{j} \beta_j X_{it}^{j} + \sum_{l=1}^{L} \beta_l X_{it}^{l} + \sum_{m=1}^{M} \beta_m X_{it}^{m} + \varepsilon_{it}, \tag{3}$$

In the above formula (3), $Foreign_{i,t}$ represents the proportion of foreign capital held by bank i in period t.

IV. EMPIRICAL ANALYSIS

4.1 Descriptive Statistics

Table II lists the descriptive statistics for the main variables. The mean value of ROA is 0.96, the standard deviation is 0.576, the minimum value is -6.53 and the maximum value is 2.334. It can be seen from the results that there are scale differences among banks of the analyzed objects. The mean values of ROE, EA, PL, PR, EXP, and S are 17.48, 6.01, 0.85, 0.208, 0.0082, and 2.842, respectively, and the maximum and minimum values are quite different. The mean value of foreign shareholding ratio is 2.03, and the maximum value is 24.99, which does not exceed the upper limit of shareholding ratio stipulated by the China Banking Regulatory Commission during the sample period.

TABLE II. Descriptive statistics

Variable	Mean	S.D.	Minimum	Maximum
ROA	0.96	0.576	-6.53	2.334
ROE	17.48	16.609	-193.89	293.184
EA	6.01	3.563	-13.714	59.064
PL	0.85	0.6372	-0.723	4.1599
PR	0.208	0.3954	-0.395	4.2770
EXP	0.0082	0.0045	0.00112	0.0321
S	2.846	.8746	-0.9136	5.1770
HH	0.156	0.017	0.128	0.2414
IE	0.029	0.024	-0.014	0.241
CO	.0011	0.021	0.037	0.035
FP	2.03	5.7	0	24.99

For the notation of the variables see Table I.

4.2 Correlation Analysis

Table III lists the correlation between variables. The article mainly uses the Pearson correlation coefficient to judge the multicollinearity between variables. According to the Pearson correlation coefficient, there is no multicollinearity between variables. In order to further determine the multicollinearity problem, the paper analyzes the VIF value (Variance Inflation Factor) between variables separately. The result shows that the VIF value is less than 3, so the multicollinearity problem between variables can be excluded.

TABLE III. Analysis of the relationship between variables

	FC	ROA	EA	PL	PR	EXP	S	HH	IE	CO
FC	1									
ROA	-.274**	1								
EA	-.346**	-.056	1							
PL	.188*	.002	-.081*	1						
PR	-.030	.046	.025	.129*	1					
EXP	-.011	-.019	.187**	.251**	.067	1				
S	-.076	.011	-.132**	-.186**	-.028	-.341**	1			
HH	-.059	-.043	-.131**	.185**	-.079	.364**	-.168**	1		
IE	-.005	.001	.067	.094*	.190**	-.052	.008	-.147**	1	
CO	.030	.021	.255**	-.129**	-.062	-.157**	.148**	-.346**	-.125**	1

For the notation of the variables see Table I. ***. P-values<0.01 **. P-values<0.05, *.p-values<0.1

4.3 Main Analysis Results

This paper uses unbalanced panel data. The analysis models used in panel linear regression analysis are also different according to different properties of u_i. The data used in this paper were extracted from Bank Scope DB, without random sampling. It is appropriate to adopt fixed effect model in this paper. In order to further confirm whether the fixed effect is really suitable for this study, the Hausman Test is performed first. The result shows that the P value is less than 0.001, indicating that the fixed effect model is suitable for the analysis of this study. Apart from model selection, there is also endogeneity among variables in panel data. In order to solve the endogeneity problem between foreign shareholding ratio and other variables, this paper adopts 2SLS (two-stage least squares) method to analyze the relationship between foreign shareholding ratio and bank profitability. The analysis results are shown in Table IV. It can be seen from the analysis results that the results of the three models are basically consistent.

There is a positive correlation between EA and bank profitability, that is, the greater the capital, the greater the bank profitability. Well-capitalized banks have high bank profitability due to low capital financing costs. Bank profitability PL is negatively correlated with PL. The higher the bad debt reserve is, the higher the loans of the bank will be, which leads to the low profitability of the bank. There is a negative correlation between EXP and bank profitability. The lower the operating expenses are, the higher the bank profitability is. The result is consistent with the current situation of Chinese commercial banks. It is found that IE has no correlation with bank profitability, while CO has a positive correlation with bank profitability. This is consistent with the results of previous studies. In addition, there is no correlation between PR, S, HH variables and bank profitability.

From the analysis results of Model 2 and 2SLS, it can be seen that there is a positive correlation between foreign shareholding ratio and bank profitability. That is, the higher the foreign shareholding ratio, the higher the profitability of the bank. Through the contact with foreign investment institutions,

local banks can learn the new technology of foreign capital and improve their business profitability.

TABLE IV. Analysis results

ROA	Model1(Panel_FE)	Model2(Panel_FE)	2SLS
EA	.031***	.030***	.023**
PL	-.34***	-.345***	-.344***
PR	.0431	.042	.019
EXP	-23.93***	-23.32***	-21.41**
S	-.065	-.070	-.0939
HH	-3.09	-3.32*	-4.67**
IE	6.01***	5.92***	5.72***
CO	3.502***	3.258***	2.89***
FP	-	.0049*	.012**
_cons	1.984***	2.015	2.38***
Adj.r	0.5717	0.5742	0.5780
F	33.87***	30.26***	4.89***

For the notation of the variables see Table I. ***. P-values<0.01 **. P-values<0.05, *.p-values<0.1

4.4 Robustness Tests

In order to enhance the validity of the conclusion, the following robustness tests are performed in this paper.

4.4.1 Dynamic Panel Model

The GMM method solves the endogeneity problem between the explained variables and the explanatory variables by properly using the instrumental variables, so this paper uses the system GMM to re-estimate. The results are shown in Table V. In the second column, GMM analysis is performed with all samples. In order to reflect the sustainability of bank earnings, the ROA value in period t-1 is used as an explanatory variable. It can be seen from the results that the coefficient of the FP variable is positive and has passed the significance test at the 1% level, indicating that banks with higher proportions of foreign capital have higher profitability.

TABLE V. GMM analysis results and analysis results of different types of banks

Variable	Full Sample	Types of banks		
		Large Commercial Banks	Joint-stock Commercial Banks	City Commercial Banks
ROA_{t-1}	.343***	.3879***	.509***	.32***
EA	-.0054	-.011	.0209	.028*
PL	-.250***	-.071	-.279***	-.385***
PR	.0797**	-.026	.072**	.455***
EXP	-15.69**	-49.478***	-9.81	22.80
S	.0274	-.061	.054	-.037
HH	-.9084	-.964	-.39	-11.04
IE	5.472***	2.176***	4.91***	4.99
CO	-.1495	-1.20e-06	1.69e-06	1.69e-06
FP	.296***	.153**	.164**	.22**
Constant term	.732	1.48	-.100	2.70
sample size	111	5	12	74
Wald-test	602.90***	256.4***	711.25***	148.88***
$Sargan - test^a$	$X^2 = 650.03$	$X^2 = 260.03$	$X^2 = 720.03$	$X^2 = 152.03$
$AR(1)^b$	Z=-5,21***	Z=-5.13***	Z=-5.43***	Z=-5.31***
$AR(2)^c$	Z=-1.22	Z=-1.12	Z=-1.32	Z=-1.25

For the notation of the variables see Table I. ***. P-values<0.01 **. P-values<0.05, *.p-values<0.1

4.4.2 Adjusting the sample range

In order to verify the robustness of the impact of foreign investment on bank profitability, the study analysizes the estimated sample by different types of banks. The samples for this analysis are divided into large commercial banks, joint-stock commercial banks, city commercial banks and rural commercial banks. Due to the very small number of foreign shareholdings in rural commercial banks, a separate analysis is not carried out in this study. The results are shown in Table V. The coefficients of FP variables in columns 3 to 5 in the table are positive and pass the significance test at the 5% level, indicating that in different types of banks, the proportion of foreign shareholding still has a positive impact on bank profitability. This is consistent with the results in Table IV and GMM, indicating that after adjusting the sample, the conclusions of this paper are still robust.

V. MAIN CONCLUSIONS AND POLICY RECOMMENDATIONS

5.1 Research Conclusions

Using the unbalanced panel data of 111 commercial banks in China from 1996 to 2017, this paper analyzes the impact of foreign equity participation on the profitability of Chinese commercial banks from the perspectives of banks, industries and macroeconomics, and draws the following conclusions:

Firstly, the introduction of foreign capital has improved the profitability of banks. After the introduction of foreign capital, local banks are actively learning the advanced knowledge and technology of foreign financial institutions, which reduces the risk-taking of Chinese commercial banks.

Secondly, among multiple variables, variables such as Capital, Credit risk, Operating expenses management, and Inflation expectations have an impact on the profitability of Chinese commercial banks.

Thirdly, through the analysis of different types of banks, the results show that in large commercial banks, joint-stock commercial banks and city commercial banks, bank profitability is proportional to the proportion of foreign equity participation.

5.2 Policy Implications

Firstly, we should actively learn advanced knowledge and technology from overseas financial institutions and establish cooperative partnerships for sustainable development. Due to their obvious advantages in technological innovation, risk management and corporate governance, overseas financial institutions can exert positive spillover effects and supervisory effects after entering the Chinese banking industry. Therefore, Chinese commercial banks should fully absorb and learn advanced knowledge and technology from overseas financial institutions to improve their own business capabilities and service quality.

Secondly, attach great importance to financial stability and implement classified management of foreign capital entering the Chinese banking system. Maintaining financial stability is an important problem for state-owned banks in their reform. In fact, the reform of state-owned banks is a process in which the government gradually reduces its control rights. The improvement of its micro profitability does not mean the improvement of its macro stability. Therefore, in the process of comprehensive opening of the financial industry, classified management should be implemented for foreign financial institutions entering the Chinese banking system.

Thirdly, promote the opening of China's banking industry to the outside world prudently, and maintain a good balance between financial openness and financial security. As FFIs may focus on the overall value of their global organization, the assumption of focusing on maximizing the value of individual firms may not apply to FFIs. Therefore, under the background of the new pattern of China's comprehensive

opening-up, the possible negative effects of foreign investment on Chinese commercial banks should be highly valued by policy makers. It is necessary to grasp the pace and intensity of the opening-up of the banking industry, maintain a strategic balance between financial opening and financial security, and maintain financial security and stability in opening up.

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