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Empirical Analysis on the Competitiveness of Commercial Banks in China

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Abstract: ***We select 12 listed banks for the study. Using the data in the 2015 semi-annual report, the paper analyzes and evaluates the competitiveness of commercial banks in China by using the principal component analysis method. The results show that ICBC, Pudong Development Bank and Industrial Bank have the strongest combined competitive strength, while Huaxia Bank, Ningbo Bank and Minsheng Bank have the weakest combined competitive strength. Further analyzing the competitiveness of listed commercial banks in China, this paper objectively reflects the competitiveness of listed commercial banks in China, and puts forward different development strategies.***

Keywords: Commercial Banks; competitiveness; Principal Component Analysis (PCA)

1. Introduction

In recent years, with the development of society and technology, more and more financial industries such as crowd funding, P2P network lending, third-party payment, etc. have begun to divide up the market with commercial banks, making China's commercial banks become very powerful external competitive forces; Internally, there is also intense competition between different banks, including customer loyalty, deposit and loan rates, and wealth management products. Therefore, how to solve the difficulties of the commercial banks 'internal and external problems has become the only way to develop the banking industry, and it is also the focus of many scholars' research. This paper focuses on the competition between commercial banks.

1.1 Research status of bank competitiveness evaluation index

Guotai Chi and others [1] (2009) used the principal component analysis method to screen the indicators of the existing set of quantifiable index system of commercial bank competitiveness evaluation. Then we get the index system of commercial bank competitiveness evaluation which reflects the information highly and is not affected by the correlation between the indicators. Cuirong Guo and Liang Liu (2012) [2] used the data of 16 listed banks in China in 2010 to analyze the competitiveness of listed commercial banks in China. They believe that Industrial and Commercial Bank, Construction Bank, Agricultural Bank, Bank of China and Ningbo Bank are the top five listed banks in China. Junhai Wu (2010) [3] established the financial evaluation index system of the competitiveness of urban commercial banks using the data of 11 urban commercial banks and made comparative analysis. Based on the results of the comparison, he put forward several points that urban commercial banks need to pay attention to improve their competitiveness. Dong Yong and Yuexiang Lu (2012) [4] set up a commercial bank competitiveness index system, and then compared China's urban commercial banks with large commercial banks and national joint-stock commercial banks. The structure shows that China's urban commercial banks have strong competitive advantages and potential competitiveness. There are obvious competitive disadvantages. Then put forward the city commercial banks to improve the competitiveness of countermeasures.

1.2 Research status of bank competitiveness evaluation method

There are three main methods for evaluating the competitiveness of banks: one, the comparative analysis method of indicators directly analyzes and evaluates several indicators, but the characteristics of this method are lack of systematic and unclear evaluation results. Two, the comprehensive evaluation method uses the statistical indicators set up to determine the weights of different indicators, then weighted the average of the indicators, and uses the corresponding method to calculate the comprehensive evaluation score. However, it is difficult to rule out the negative interference caused by the correlation between the indicators. Three, The principal component analysis method avoids the shortcomings of the comprehensive scoring method, but the existing research uses fewer evaluation indicators and is easy to generalize. [5]

In general, the study on the competitiveness of commercial banks has covered all aspects of commercial banks, but it has been a long time ago. Today, the structure of the banking industry is quietly changing. This article uses the latest commercial bank data to carry out the latest analysis of the competitiveness of Chinese commercial banks. And according to the analysis results to provide advice for its development.

2. Establishment of a system for evaluating the competitiveness of commercial banks

The index system for evaluating the competitiveness of commercial banks should be able to comprehensively reflect the comprehensive information of various aspects such as its size, security, profitability, liquidity, and development, and not only reflect its information in one aspect. Therefore, when selecting indicators, Attention should be paid to the comprehensiveness and systematic nature of the indicators. At the same time, the scientific nature and availability of

indicators must be balanced. Taking into consideration, this paper intends to select the following indicators to study the competitiveness of commercial banks in China.

2.1 Scale strength indicators

The appropriate scale is conducive to banks to generate economies of scale, save operating costs, and increase competitive strength. In order to measure the scale strength of commercial banks in China, this paper mainly chooses three indexes: total assets, intangible assets and goodwill to measure the scale strength of commercial banks. Among them, total assets represent the financial strength of an enterprise, while intangible assets refer to identifiable non-monetary assets that are not in physical form owned or controlled by the enterprise. Goodwill refers to the potential economic value that can bring excess profits to business operations in the future. Or a company's expected profitability exceeds the capitalization value of the profitability of the identifiable asset policy, both of which reflect the strength of the company.

2.2 Profitability indicators

Enterprises are all for the purpose of profit, and the measure of a company's business performance must be to study its profitability. In this study, we mainly choose the operating income, interest income, operating profit, total profit, net profit, and basic earnings per share as the indicators to study the profitability of commercial banks.

2.3 Security indicators

As an industry that controls the lifeblood of the national economy, safety has always been the most concerned indicator, because once a bank goes bankrupt, it will lead to a series of chain reactions, which will cause social turmoil and hinder economic development. In order to study the safety of commercial banks in China, this paper mainly uses capital adequacy ratio and non-performing loan ratio. Among them, the capital adequacy ratio is the ratio of a bank's assets to its risks, and it is the capital ratio necessary to ensure the normal operation and development of financial institutions such as banks; The non-performing loan rate refers to the proportion of non-performing loans of financial institutions in the total loan balance. When assessing the quality of bank loans, loans are divided into five categories: normal, concerned, secondary, suspicious and lost according to the risk base, of which the latter three categories are collectively called non-performing loans.

2.4 Liquidity indicators

Commercial bank liquidity refers to the ability of commercial banks to meet the needs of depositors to withdraw cash, pay maturing debts and borrowers 'policy loans. It is the goal of commercial bank liquidity management to maintain the appropriate liquidity. Considering the availability of data, this paper selects the two indexes of deposit-taking and debt-taking to measure the liquidity of commercial banks in China.

2.5 Capacity development indicators

A good company should not only be profitable, but also pay attention to long-term development, so should commercial banks. This paper makes use of the three indexes of deposit growth rate, loan growth rate and profit growth rate to measure the development capacity of commercial banks in our country.

Table 2.1: Commercial Bank Competitiveness Evaluation System

index	variable	unit	Data processing
Scale strength indicators	intangible assets	million	logarithm
	goodwill	million	logarithm
	total assets	million	logarithm
Profitability indicators	operating income	million	logarithm
	interest income	million	logarithm
	operating profit	million	logarithm
	total profit	million	logarithm
	net profit	million	logarithm
	basic earnings per share	million	logarithm
Security indicators	capital adequacy ratio	%	——
	non-performing loan rate	%	——
Liquidity indicators	receipt of deposits	million	logarithm
	liabilities	million	logarithm
Capacity development indicators	deposit growth rate	%	——
	loan growth rate	%	——
	profit growth rate	%	——

3. Empirical Analysis

Empirical analysis is the core content of this article. In order to study the competitiveness of China's commercial banks, this article selected the above ten indicators, but in the process of data analysis, too many indicators will bring difficulties to analysis and evaluation. Therefore, This paper uses the principal component analysis method to reduce the dimension of the selected index and evaluates the competitiveness of commercial banks in China according to the results of the treatment.

3.1 Data Selection

At present, China's commercial banks mainly include large joint-stock commercial banks(state-owned banks), small and medium-sized joint-stock commercial banks and rural commercial banks. Large-scale joint-stock commercial banks refer to commercial banks directly controlled by the state(Ministry of Finance, Central Huijin Company) and are the first shareholders. At present, they mainly include: Industrial and Commercial Bank of China, Agricultural Bank of China, Bank of China, China Construction Bank, and Bank of Communications. A total of 5. Small and medium-sized joint-stock commercial banks are banks with state-owned legal entities(ie, state-owned enterprises or local governments) as the first controlling shareholders, and joint-stock banks that, with the approval of the People's Bank of China, carry out commercial and financial business nationwide. City Commercial Bank is an important component and special group of China's banking industry. Its predecessor was the Urban Credit Union established in the 1980s. At that time, its business orientation was to provide financial support for small and medium-sized

enterprises and pave the way for local economies. Rural commercial bank is a local joint-stock financial institution composed of farmers, rural industrial and commercial households, corporate legal persons, and other economic organizations.

In order to study the competition situation of commercial banks in China, this paper selected 12 A-share commercial banks listed in Shanghai or Shenzhen: Ping An Bank, Ningbo Bank, Pudong Development Bank, Huaxia Bank, China Merchants Bank, Nanjing Bank, Industrial Bank, Beijing Bank, Agricultural Bank, Minsheng Bank, Bank of Communications and Industrial and Commercial Bank. Among them, state-owned commercial banks include Industrial and Commercial Bank, Bank of Communications, and Agricultural Bank. Urban commercial banks have Ningbo Bank, Nanjing Bank, Beijing Bank, and joint-stock commercial banks have Ping An Bank, Pudong Development Bank, Huaxia Bank, China Merchants Bank, Industrial Bank and Minsheng Bank. Since rural commercial banks have not yet been listed, the data are difficult to obtain and no research is done here.

The data are derived from the Xenophon database and the financial statements of various commercial banks compiled by the author. The statistical time is the first half of 2015.

3.2 Data Analysis

SPSS software is used to analyze the main components of the selected data. The specific process is shown below.

Table 3.1: Total variance of interpretation

ingredient	initial eigenvalues			sum of the extracted squares		
	total	variance	sum	total	variance	sum
1	12.554	73.846	73.846	12.554	73.846	73.846
2	2.573	15.135	88.981	2.573	15.135	88.981
3	1.873	11.019	100.000	1.873	11.019	100.000
4	6.336E-16	3.727E-15	100.000			
5	4.178E-16	2.458E-15	100.000			
6	3.101E-16	1.824E-15	100.000			
7	2.015E-16	1.185E-15	100.000			
8	1.357E-16	7.985E-16	100.000			
9	1.193E-16	7.017E-16	100.000			
10	9.392E-19	5.524E-18	100.000			
11	-1.945E-17	-1.144E-16	100.000			
12	-3.053E-17	-1.796E-16	100.000			
13	-1.465E-16	-8.619E-16	100.000			
14	-2.219E-16	-1.305E-15	100.000			
15	-3.168E-16	-1.864E-15	100.000			
16	-3.840E-16	-2.259E-15	100.000			
17	-5.502E-16	-3.237E-15	100.000			

It can be seen that when using factor analysis to reduce the dimension of statistical data, the software extracts 3 principal components from these 17 variables, which can explain 100 % of the data.

Table 3.2: Component Matrix

	ingredient		
	1	2	3
intangible assets	0.580	0.758	0.299
goodwill	-0.371	0.399	0.864
total assets	0.994	0.019	-0.106
receipt of deposits	0.968	0.164	0.021
total liabilities	-0.994	-0.018	0.109
operating income	0.995	0.064	0.079
interest income	0.990	0.0.27	-0.142
total operating income	0.995	0.064	0.079
operating profit	0.998	-0.065	-0.013
total profit	0.998	-0.64	0.079
net profit	0.997	-0.073	-0.025
basic Earnings per share	-0.558	-0.827	0.066
capital adequacy ratio	0.807	-0.589	0.045
deposit growth rate	-0.246	0.390	-0.888
loan growth rate	-0.633	0.714	-0.300
profit growth rate	-0.950	0.205	0.234
non-performing loan rate	0.927	0.316	0.202

It can be seen that component 1 is mainly used to describe the variables of total assets, deposits, operating income, interest income, operating income, operating profit, total profit, net profit, capital adequacy rate, and non-performing loan rate. Component 2 mainly explains the three variables of intangible assets, deposit growth rate, and loan growth rate. Component 3 mainly explains the indicators of liabilities, goodwill, profit growth rate, and basic earnings per share. According to the characteristics of the variables explained by each component, component 1 is defined as operational capability, component 2 is defined as developmental capability, and component 3 is defined as risk control capability.

3.3 Results of empirical analysis

According to the method of principal component analysis, the scores of commercial banks under different components are calculated separately, and according to the rankings, the following results can be obtained.

Table 3.3: Commercial bank rankings

ranking	Ingredient1	Ingredient2	Ingredient3	Comprehensive score
first	Industrial and Commercial Bank	Pudong Development Bank	Ping An Bank	Industrial and Commercial Bank
second	the Agricultural Bank	Industrial Bank	China Merchants Bank	Pudong Development Bank
third	Bank of Communications	China Merchants Bank	Industrial and Commercial Bank	Industrial Bank
fourth	Industrial Bank	Nanjing Bank	Nanjing Bank	China Merchants Bank
fifth	Pudong Development Bank	Ping An Bank	Industrial Bank	Ping An Bank
sixth	China Merchants Bank	Minsheng Bank	Pudong Development Bank	Nanjing Bank
seventh	Beijing Bank	Ningbo Bank	Huaxia Bank	the Agricultural Bank
eighth	Nanjing Bank	Industrial and Commercial Bank	Beijing Bank	Bank of Communications
ninth	Huaxia Bank	Beijing Bank	Bank of Communications	Beijing Bank
tenth	Ningbo Bank	the Agricultural Bank	the Agricultural Bank	Huaxia Bank
eleventh	Ping An Bank	Bank of Communications	Minsheng Bank	Ningbo Bank
twelfth	Minsheng Bank	Huaxia Bank	Ningbo Bank	Minsheng Bank

From the results, it can be seen that in terms of operating capacity, Industrial and Commercial Bank and Agricultural Bank ranked first and second respectively, indicating that the two banks have a comparative advantage in operating. In terms of development momentum, pufa bank, industrial and commercial banks in these cities have obvious advantages, in terms of operating capacity, the first industrial and commercial banks are obviously insufficient, in the future development to find their own advantages, strengths and weaknesses. In terms of the risks investors face in investing in these commercial banks, Ping An Bank and China Merchants Bank have more advantages.

Overall, Industrial and Commercial Bank is the most powerful, and its ability to operate, develop and control risks is relatively high in the ranking of banks, indicating that it is not the best in terms of operating ability and development ability. However, it took into account all aspects of strategic deployment. It can be noted that the only three city commercial banks in the sample: Beijing Bank, Ningbo Bank and Nanjing Bank, their rankings are not high, indicating that urban commercial banks still need to improve in terms of overall strength.

4. Conclusions and Recommendations

4.1 Conclusions

From the above analysis, it can be seen that large joint-stock commercial banks have obvious advantages in terms of operating ability. From the aspects of capital strength, profitability, and risk control ability, they all have advantages that are beyond the reach of small and medium-sized commercial banks and urban commercial banks. The reason for this phenomenon is that large joint-stock commercial banks have developed earlier in China and there are no geographical restrictions. Urban banks are generally limited to a fixed city and the market scope is relatively small. The advantages of **small** and medium-sized commercial banks are that they have relatively strong development capabilities, rank relatively high, and deposit and loan growth rates are relatively large. This is also the main direction for the development of small and medium-sized joint-stock commercial banks in the future. Urban commercial banks do not have the obvious advantages of the first two kinds of joint-stock commercial banks in terms of operating ability and development ability, but in comparison, developing ability has more advantages than operating ability. Based on the results of the analysis, the author puts forward some suggestions for the development of these three commercial banks.

4.2 Recommendations

State-owned commercial banks: the deficiency of state-owned commercial banks lies in their ability to develop, which is threatened by urban commercial banks and small and medium-sized joint-stock commercial banks. Firstly, large joint-stock commercial banks can set up competitive deposit and loan rates on the premise of preventing malicious competition. While paying attention to the control of key customers, they should take into account the interests and customer experience of potential customers. Second, large joint-stock commercial banks can design more wealth management products for customers to follow the wave of Internet finance development in order to effectively cope with the impact of Internet finance on traditional commercial banks.

Small and medium-sized joint-stock commercial banks: compared with state-owned commercial banks, small and medium-sized joint-stock commercial banks have comparative disadvantages in terms of operating ability and comparative advantages in terms of developing ability. In order to improve the competitiveness of small and medium-sized joint-stock commercial banks, relevant strategic decision makers can focus on business ability, improve their own capital strength, and draw up relevant preferential policies to absorb deposits; In terms of loans, the risk of default can be reduced by establishing a corresponding credit rating system, thus reducing the non-performing loan rate.

City commercial bank: for urban commercial banks, when improving their competitiveness, they should improve their management ability and risk control ability. First of all, we must carry out scientific market positioning. Specifically, urban commercial banks should serve local governments, serve small and medium-sized enterprises, and serve the public. With the support of local governments and the People's Bank of China, they should provide financial services for the development of the local economy and actively participate in local economic reforms. in. Secondly, to build brand banks, city commercial banks should establish their own brand, form their own characteristics, and then improve their own popularity.

Generally speaking, the biggest challenge facing traditional commercial banks in China comes from the outside, that is, the rapid development of Internet finance. Commercial banks are facing great challenges in terms of deposit and loan rates, customer experience, etc.. Therefore, if China's commercial banks want to achieve sustainable development in the fierce competition, they must reform in the competition, formulate financial and financial products suitable to the market, and carry out reforms from the customer experience such as the convenience of withdrawals and withdrawals to meet the needs of customers. At the same time, China's commercial banks should give full play to their big data advantages, in the brand and credibility of more self-image.

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