

Analysis of Assets and Liabilities Structure and Profitability of Commercial Banks

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Abstract

As a financial institution, a bank is very different from other enterprises. At the same time, as a credit intermediary, the bank's asset and liability business is an important way to realize this function. Banks form deposits by attracting all kinds of funds from the society, and then put the funds into social industries through asset business, collect interest, and achieve profitability. Therefore, controlling the Asset-liability structure is crucial to the bank's profitability. This paper selects 12 commercial banks in my country, including 5 state-owned commercial banks and 7 national joint-stock commercial banks, as the research objects, and takes the Asset-liability management theory and Asset-liability structure adjustment as the research starting point. A qualitative analysis was carried out on the current situation of the Asset-liability structure of 12 commercial banks, the trend of the Asset-liability structure of commercial banks was analyzed horizontally, and the differences between the banks and the differences between state-owned commercial banks and national joint-stock commercial banks were compared vertically. difference. Using empirical analysis to conduct regression analysis on the factors affecting the profitability of commercial banks, the results show that the proportion of deposits, the proportion of cash, the proportion of loans and advances are positively correlated with the profitability of commercial banks, and the ratio of securities investment and the profitability of commercial banks Into a negative correlation. Finally, based on the results of the empirical analysis, the following suggestions are put forward: First, optimize the deposit and loan structure; second, strengthen asset quality management; third, increase financial innovation; fourth, increase the development of intermediary business.

Keywords

Commercial Banks; Asset-liability Structure; Profitability.

1. Introduction

As a financial institution, banks are very different from other enterprises. Banks absorb all kinds of funds from the society to form deposits, and then invest the funds in various industries in the society, collect interest from them, and realize profits. Therefore, they control the structure of assets and liabilities. It is vital to the bank's profitability. At the same time, the bank acts as a credit intermediary and its asset and liability business is an important way to realize this function. In recent years, China's economic development has entered a new normal. Economic growth has shifted from high-speed growth to high-quality growth. Internet finance has developed vigorously, financial disintermediation has deepened, third-party payment software has sprung up like mushrooms, and commercial banks have also developed. Facing new challenges and unprecedented pressure. Traditional bank income is mainly derived from the interest rate differential between absorbing public deposits and external loans, while intermediary business accounts for a relatively small proportion of income. Commercial banks are profitable enterprises, so improving profitability is the most important goal of commercial banks. We need to analyze the economic environment of the commercial bank and the internal

Asset-liability structure of the bank, find out the problems in the allocation and structure of assets and liabilities, and find corresponding countermeasures to solve the problem, to finally improve the profitability of the commercial bank the goal of.

In theory, some domestic and foreign scholars have done research on the status quo of the Asset-liability structure of commercial banks and their profitability, but most of them have studied the Asset-liability structure or profitability of banks, or focused on assets. Changes in the debt structure may focus on policy control. In a practical sense, commercial banks are now facing various challenges, financial disintermediation is increasing, and interest rate liberalization has had a huge impact on the traditional banking industry. Commercial banks must start looking for new countermeasures, analyze the existing problems and risks in their own Asset-liability structure, and draw adjustment plans based on the analysis results, improve business methods, optimize Asset-liability structure, find new breakthroughs, and develop intermediate Business, launch new business models to adapt to new forms, improve profitability, and meet new challenges. Therefore, it is of practical significance to study the Asset-liability structure and profitability of commercial banks.

2. Organization of the Text

2.1. Commercial Bank Overview

First, it will be explained from the external environment of the commercial bank. In recent years, international trade disputes have frequently appeared, Sino-US trade frictions have continued to intensify, coupled with the huge impact of the current novel coronavirus pneumonia epidemic on the global economy, many domestic small and medium-sized enterprises are unable to operate normally, and some are even facing the risk of bankruptcy. The reduction in credit demand has led to an increase in the bad debt ratio of banks, which has a negative impact on the profitability of commercial banks. In addition, with the development of Internet technology, large Internet companies such as Alibaba and Tencent have entered the financial sector, and third-party payment platforms such as WeChat and Alipay have become popular across the country. Residents have more choices and commercial banks have fewer sources of funds. , External competition has intensified, which forces commercial banks to examine their internal management and planning from all aspects, how to face the huge threats brought by the external environment, and how to improve their own profitability.

Secondly, the internal management and related businesses of commercial banks need to advance together with the times, which prompts commercial banks to carry out innovative development. Improving internal management systems, capital management distribution, improving staff levels and service quality, etc. are all urgently needed by commercial banks. problem. Only by advancing with the times can we not be eliminated by society, which is the same as the human survival law: the survival of the fittest and the survival of the fittest. Commercial banks first need to start from the inside, find out whether there are problems with the internal structure, and think about how to improve the status quo, optimize the internal structure, increase profitability, and ensure the normal and efficient operation of the bank. Therefore, this paper conducts a qualitative and quantitative analysis of the Asset-liability structure of commercial banks, hoping to find a plan to optimize the Asset-liability structure, and make a little contribution to the sustainable and stable development of commercial banks.

2.2. Status Analysis Index Selection

DoAt present, my country's commercial banks are mainly divided into state-owned commercial banks, national joint-stock commercial banks, city commercial banks, and rural commercial banks. Among them, state-owned commercial banks and joint-stock commercial banks mainly include the following 18 (as shown in Table 1 below):

Table 1. Classification of major commercial banks in my country

Large State-owned Commercial Bank	<u>ICBC</u>	<u>ABC</u>	<u>BC</u>
	<u>CCB</u>	<u>PSBC</u>	<u>BCM</u>
National joint-stock commercial bank	<u>CMB</u>	<u>SPDB</u>	<u>CCITICB</u>
	<u>HB</u>	<u>CMBC</u>	<u>CEB</u>
	<u>CIB</u>	<u>SPAB</u>	<u>GDB</u>
	<u>CZB</u>	<u>BHB</u>	<u>EGB</u>

In order to analyze the current status of the Asset-liability structure and profitability of commercial banks, and considering the convenience and completeness of data acquisition, I selected the data of 12 commercial banks in my country (the underlined banks in Table 1) from 2010 to 2018 as The research object calculated the following indicators based on the data in its annual financial report (as shown in Table 2):

Table 2. Index selection

	Indicator
Asset-liability structure	Assets and liabilities
Asset structure	Percentage of cash
	Proportion of loans
	Investment proportion
Debt structure	Proportion of deposits
	Proportion of loans
Profitability	Net asset profit margin
	Roe

And compare these indicators horizontally with other banks, analyze the trend changes from 2010 to 2018 vertically, and analyze them qualitatively in combination with some external environment and regulatory policies.

3. Empirical Analysis

3.1. Unit Root Test

Because the panel data contains two dimensions, the cross-sectional dimension and the time dimension, the stationarity of the data must be tested before regression analysis to avoid spurious regression. First use excel to sort out the index data of 12 commercial banks from 2010 to 2018, convert the cross-sectional data into panel data, and then import the data into the Eviews9.0 software, and perform LLC test, ADF test and PP test on 7 variables in turn , The null hypotheses of these three test methods are that the original sequence is not stable. When the test results of two of the three test methods reject the null hypothesis, the final P value is less than 0.1 (including three These levels are at the confidence levels of 10%, 5%, and 1% respectively. The smaller the percentage, the higher the accuracy), which indicates that the indicator is stable. As shown in Table 3, the ROA, DTL, CR, OER, PIR, and LASSET indicators have passed the level value test. The LAR indicator has undergone a first-order difference, and finally a first-order single integer is obtained. Therefore, it can be concluded that there is no unit root. If the original sequence is considered to be stationary, the next step can be performed to test the cointegration of the variables.

Table 3. Results of stationarity test of each variable

index	LLC test	ADF test	PP test	conclusion
ROA	-6.16955***	27.6927	75.5234***	steady
LAR*	-7.04567***	31.429	57.6775***	steady
DTL	-6.9682***	37.2252**	50.547***	steady
CR	-9.58746***	43.7889***	99.4058***	steady
OER	-9.88707***	56.471***	51.6808***	steady
PIR	-9.83631***	37.2875**	97.7619***	steady
LASSET	-6.64231***	29.5094	40.6483**	steady

3.2. Cointegration Test

In order to prevent the phenomenon of false regression, we need to study the net profit margin (ROA) and the proportion of loans and advances (LAR), the proportion of deposits (DTL), the proportion of cash (CR), and the proportion of owner's equity (OER) 1. Whether there is a co-integration relationship between the securities investment ratio (PIR) and the bank size (LASSET), the commonly used methods of co-integration test are KAO test and Johansen Fisher test. In this paper, the KAO test method is used to conduct co-integration test on the data. The test results are shown in Table 4 below, and the P value is $0.0002 < 0.01$, so the null hypothesis is rejected, which indicates that there is a co-integration relationship between the variables, and the panel data can be regression analyzed.

Table 4. Cointegration test results

	t-Statistic	Prob.
ADF	-3.586667	0.0002***
Residual variance	0.005742	
HAC variance	0.006471	

3.3. Panel Data Model Selection

The model must be selected before regression analysis. Panel data models usually have the following three types: fixed effects model, mixed effects model and random effects model. The method of selecting the model generally uses F test and Hausman test.

First, we use the F test to determine whether the mixed effects model is more appropriate or the fixed effects model is better. F test hypothesis:

H0: The intercepts of different individuals in the model are the same, which is a mixed regression model;

H1: Different individual intercepts in the model are different, which is an individual fixed-effect model;

The definition of F is:

$$F = (S1 - S2) / (N - 1) / S2 / (NT - N - K) \quad (11)$$

Among them, S_1 is the residual sum of squares of the mixed regression estimation model, S_2 is the residual sum of squares of the individual fixed-effects model; N is the sample size, that is, the number of banks; T is the time interval; K is the variable. After regression, we can get: $S_1 = 1.870376$, $S_2 = 0.670125$, and $N = 12$, $T = 9$, $K = 6$. The calculated value of F is 14.65433383 , which is greater than $F_{0.05}(N-1, NT-1-K) = F(11, 101) = 1.885$, so the null hypothesis is rejected, indicating that the individual solid effect model is better.

Table 5. Calculation of F value

S ₁	S ₂	N	T	K	numerator	Denominator	F
1.870376	0.670125	12	9	6	0.109113727	0.007445833	14.65433383

Next, determine whether to choose an individual random effects model or an individual fixed effects model, through Hausman test, hypothesis:

H0: The real model is an individual random effect model;

H1: The real model is an individual fixed-effect model;

The results of the Hausman test are shown in Table 6 below. The p value is 0.0005. The null hypothesis is rejected at the confidence level of $\alpha=0.01$, so the individual fixed-effects model is selected.

Table 6. Hausman test results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	24.100044	6	0.0005***

3.4. Regression Analysis

Table 7. Regression results of individual fixed effects model

Variable	Coefficient	t-Statistic	Prob.
C	2.970124	2.517673	0.0139**
LAR*	0.005427	2.025110	0.0463**
DTL	0.006751	3.319703	0.0014***
CR	0.023835	3.872653	0.0002***
OER	0.006696	0.411804	0.6816
PIR	-0.007651	-2.968269	0.0040***
LASSET	-0.170329	-2.488435	0.0150**

Effects Specification			
Cross-section fixed (dummy variables)			
Weighted Statistics			
R-squared	0.916218	Mean dependent var	1.150380
Adjusted R-squared	0.897958	S.D. dependent var	0.376714
S.E. of regression	0.065560	Sum squared resid	0.335257
F-statistic	50.17600	Durbin-Watson stat	1.157070
Prob(F-statistic)	0.000000		

Regression based on the individual fixed-effects model, and the final results are shown in Table 7. It can be seen that the R-squared (fitness) value is 0.916218, which means that the degree of fit of the equation is very high. The higher the degree of fit. The F-statistic value is 50.17600, and the P value is 0.0000, indicating that the equation is significant. From the P value of the t statistic, it can be seen that the proportion of loans and advances (LAR) and the size of banks (LASSET) are significant within the 5% confidence interval, the proportion of deposits (DTL),

the proportion of cash (CR) and securities The investment ratio (PIR) is significant within the 1% confidence interval, while the owner's equity (OER) is not significant.

4. Conclusion

First, in the introduction, this article gives a general discussion of the research background and significance of this topic, and then leads to the research methods and research content of the following text.

The first chapter of this article describes the current development of commercial banks, selects the financial indicators of 12 commercial banks in my country, and conducts a qualitative analysis on them. Commercial bank assets are mainly composed of cash and central bank deposits, loans and advances, securities investment, etc. According to the previous analysis of the current situation of the asset structure, the following points can be drawn: First, the cash-to-asset ratio of China's commercial banks It shows a trend of slow decline year by year, but its ratio still has a certain gap compared with the international advanced level, and there is still a lot of room for improvement. Second, commercial banks obtain profits through the interest rate difference between deposits and loans, and credit assets are commercial assets. The main way for banks to obtain profits is the low loan ratio. Although it has rebounded in recent years, it is still far from the ideal loan ratio. Third, in recent years, with the popularization of mobile payment tools, commercial banks have absorbed deposits. Business has been greatly impacted. Commercial banks should find ways to innovate and launch new products to attract young customers and meet the needs of the younger generation of customer groups. Fourth, securities investment business is also the main source of commercial banks' profits. More investment business, broaden the business scope of the bank, and improve the profitability of the bank.

The second chapter of this article uses Eviews9.0 software to conduct an empirical analysis of the Asset-liability structure of commercial banks. First, the data is sorted into panel data, and then unit root test and co-integration test are performed on its stability, and then the fixed effects regression model Among the three models, the mixed regression model and the random effects regression model, the most suitable panel data analysis model, the individual fixed effects model, was selected using F test and Hausman test. The correlation between the indicators and the profitability of commercial banks is analyzed in combination with the actual situation and the previous qualitative analysis, and the reasons are explored.

Chapter 3 of this article puts forward some suggestions based on the previous empirical analysis results, hoping to give some help to the research on optimizing the Asset-liability structure of commercial banks and improving the profitability of commercial banks.

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