

Research on the Factors Affecting Non-Performing Loan of Chinese Commercial Bank

Fei Zhou^{1, a}, Xuanfeng Xu^{1, b} and Shoudu Xie^{1, c}

¹ Shanghai University, 20 Chengzhong Road, Jiading District, Shanghai, China

^a Zhouhuihui2014@163.com, ^b xuxuanfeng123@126.com, ^c iamno1995@126.com

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Abstract. The rise of non-performing loans has weakened the core competitiveness of commercial banks, and also hindered the reform and innovation of China's banking industry and the stable operation of the macro economy. Therefore, researching the problem of non-performing loans has its theoretical and practical significance. This paper selected 10 listed Banks as research objects, adopted the panel data from the first quarter of 2012 to the third quarter of 2018, and explored the influencing factors of the non-performing loan ratio through the multiple regression model. The conclusions have been shown as follows: (1) PMI, bank provision coverage and net interest margin have a significant negative impact on non-performing loans; (2) total loans have a significant positive impact on non-performing loan ratio. The research shows that the government's macro-control and bank management can be put forward to prevent and dispose of China's commercial Banks non-performing loans.

Introduction

Both the macroeconomic health operation and the reform and innovation of commercial banks require that the problem of non-performing loans of commercial banks be effectively resolved.

The research on non-performing loans has always been a hot topic in the financial and academic circles at home and abroad. From the macro perspective. R.N. Mao (2002) believes that the root cause of non-performing loans of commercial banks is that social funds are excessively concentrated in banks, and economic growth is excessively dependent on bank credit.[1] Jimenez and Gabriel et al. (2005) found that GDP growth rates, loose credit conditions and higher real interest rates have a significant impact on non-performing loans.[2] B. Xie(2009) found that macroeconomic factors are negatively correlated with the balance of non-performing loans; total retail sales of social consumer goods and total import and export have the greatest contribution to reducing non-performing loans of commercial banks.[3] Louzis and Vouldis et al. (2012) found that many indicators of macroeconomics can explain the increase in non-performing loans to a large extent.[4]

From the micro perspective. Keeton and Morris (1987) argue that commercial banks with higher risk preferences tend to have higher loan losses.[5] In analyzing the financial crisis in Southeast Asia, Y.F. Lin(1998) pointed out that the important reason for the high proportion of non-performing loans in the banking system of Southeast Asian countries is that the target of bank credit supply is mainly low-efficiency industries and enterprises.[6]

From the macro-micro perspective. Sinkey and Greenwalt (1991) found that both internal and external factors explained the loan loss rate of commercial banks, and found that the loan loss rate has a significant positive relationship with internal factors.[7] Fofack (2005) found that the main factors of non-performing loans of commercial banks are: GDP growth, real exchange rate, net interest margin, real interest rate, interbank loans.[8] W.W. Yue and X.G. Zheng (2011) found that the fluctuation of non-performing loan ratio has a greater restrictive effect on the speed of economic growth, while economic growth only has a significant impact on the downward trend of non-performing loan ratio, and the effect of non-performing loan ratio itself is not obvious.[9]

In the research of disposing of non-performing loans, J. Zhu(2010) pointed out that in addition to the conventional litigation and write-off methods, commercial banks can also handle non-performing loans by means of package transfer and asset securitization.[10]

Non-Performing Loans of Chinese Commercial Banks

General Overview of Non-Performing Loans of Commercial Banks in China. Observing the main regulatory indicators of commercial banks, it can be found that as of the end of the third quarter of 2018, the non-performing loan balance of commercial banks was 2.03 trillion yuan, the non-performing loan ratio of commercial banks was 1.87%, which was a 10-year high; the loan loss provision for commercial banks was 3.67 trillion yuan; the capital adequacy ratio of the entire banking industry is 13.81%, and the provision coverage ratio is 180.73%, which is in line with regulatory requirements.

Fig. 1 depicts the non-performing loan balance and ratio of China's commercial banks from 2005 to 2018. From the data in the figure, the trend of non-performing loans can be roughly divided into two stages, one drop and one liter. The first phase was roughly from 2005 to 2011, with both non-performing loan balances and non-performing loan ratios falling. The second phase is the rising phase after 2011. The balance of non-performing loans and the non-performing loan ratio changed from double decline to double rise, indicating that the credit quality of Chinese commercial banks began to deteriorate again.

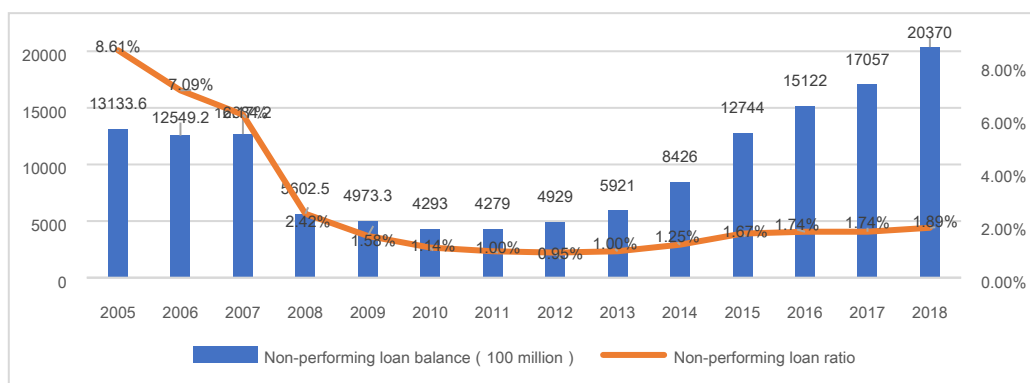


Fig. 1 Non-performing loans of commercial banks in China from 2005 to 2018(100 million yuan)

Factors Affecting Non-Performing Loans of Chinese Commercial Banks. There are many reasons for the emergence of non-performing loans in commercial banks. Macroeconomic factors are a comprehensive statement that includes not only economic development, economic systems, and national economic policies, but also other factors that are not directly related to commercial banks and businesses. For example, the impact of macroeconomic development on non-performing loans, in the economic recession stage, the decline in corporate income and profitability will lead to difficulties in corporate capital turnover, followed by loan defaults and the increase in non-performing loans of commercial banks. The generation of non-performing loans is directly related to commercial banks and enterprises. Poor management of loans by banks is an important reason for generating bad loans. There are three main points. First, the commercial bank's risk awareness is weak. Second, there are institutional defects. Commercial banks have not established a series of perfect supporting mechanisms while expanding their scale. Third, the risk monitoring of loans is weak. On the business side. There are several reasons for corporate loan defaults. First, the business management is not good. Second, the use of loans is inefficient. Third, the credit of the company is poor.

Empirical Analysis

Selection of Variables and Samples. This paper selects 10 well-documented listed banks as

research objects for empirical analysis. These 10 listed banks include ICBC,BOC,CCB,BCM,CIB,CMB,SPD Bank, CHINA CITIC Bank, Bank OF Ningbo, Bank of Nanjing. An empirical study was conducted on relevant quarterly data from the first quarter of 2012 to the third quarter of 2018. A total of four macroeconomic indicators and two operational management indicators of 10 listed banks were selected. Among them, GDP growth rate, narrow money supply, and PMI index come from the national statistical website. The total amount of loans comes from the website of the People's Bank of China. The non-performing loan ratio, provision coverage ratio and net interest spread of commercial banks are derived from the quarterly and annual reports of listed banks. Table 1 shows the corresponding representative symbols, units, types, and assumptions to be tested for each variable.

Table 1 Description of variables

Variable	Symbol	Unit	Types	Test hypothesis
Non-performing loan ratio	RNPL	%	Explained variable	
GDP growth rate	RGDP	%	Explanatory variable	Negative correlation
Money supply	M1	Million yuan	Explanatory variable	Positive correlation
Total amount of loans	LOAN	Million yuan	Explanatory variable	Positive correlation
Purchasing manger index	PMI	%	Explanatory variable	Negative correlation
Provision coverage	PCR	%	Explanatory variable	Negative correlation
Net interest margin	NIM	%	Explanatory variable	Negative correlation

In order to eliminate the influence of heteroscedasticity on data analysis, this paper makes a logarithmic transformation of money supply and total loan amount. A statistical description of the variables is shown in Table 2.

Table 2 Statistical description of variables

Variable name	Mean	Maximum	Minimum	Std Dev
RNPL	0.013046	0.162000	0.004300	0.011064
RGDP	0.071180	0.077400	0.067000	0.003677
LNMI	17.47885	17.80049	17.16614	0.215436
LNLOAN	18.37211	18.73995	7.98474	0.226318
PCR	2.445335	5.026700	1.324400	0.906500
PMI	0.506623	0.518333	0.495333	0.006915
NIM	0.005405	0.007272	0.003207	0.000886

Analysis of Measurement Models. This paper conducts LLC test of the same unit root and Fisher-ADF test of different unit roots for panel data of various commercial banks. Using the Eviews 8.0 test, the test results are shown in Table 3: The Prob of RNPL, LNLOAN, PCR, and PMI are all less than 0.1 at 5% significance level, rejecting the null hypothesis that the four sequences are stationary. The Prob of RGDP, LNM1 and NIM is basically greater than 0.1, which indicates that the three sequences are not stable, and after the differential processing, all the sequences become a stationary sequence.

Table 3 Unit root test results of panel data

Variable	LLC test		Fisher-ADF test		Test result
	Statistic	Prob.	Statistic	Porb.	
RNPL	-3.88632	0.0001	51.4892	0.0001	Stable
RGDP	-4.27734	0.0000	22.8849	0.2945	Not stable
LNMI	1.06395	0.8563	1.13366	1.0000	Not stable
LNLOAN	-12.0011	0.0000	66.9867	0.0000	Stable
PCR	-3.86691	0.0001	34.9327	0.0205	Stable
PMI	-4.07702	0.0000	43.1522	0.0020	Stable
NIM	-1.20330	0.1144	33.1140	0.0328	Not stable
D (RGDP)	-16.6333	0.0000	188.833	0.0000	Stable
D(LNMI)	9.25987	1.0000	24.9467	0.2035	Not stable
D(NIM)	-12.3283	0.0000	215.618	0.0000	Stable

The measurement model is set to the following form:

$$RNPL_{it} = \beta_0 + \beta_1 RGDP_{it} + \beta_2 M1_{it} + \beta_3 LOAN_{it} + \beta_4 PCR_{it} + \beta_5 PMI_{it} + \beta_6 NIM_{it} + \varepsilon_{it}$$

Among them, the subscripts $i=1, 2, 3 \dots 10$ indicate the selected 10 listed companies, and the subscripts $t=1, 2, 3 \dots 27$ indicate the selected 27 time sections. $RGDP_t$ is expressed as the GDP growth rate in time section t ; $M1_t$ is expressed as the narrow money supply in China at time section t ; $LOAN_t$ is expressed as the total amount of loans in China at time section t ; PMI_t is expressed as time in section t China's manufacturing PMI index; PCR_{it} represents the provision coverage ratio of commercial bank i in the t -time cross section; NIM_{it} represents the net interest spread of commercial bank i in the t -time cross section; β_0 represents the intercept term; ε_{it} represents the random error term.

Outcome of Practice. After the Hausman test on the panel data, the results show that the null hypothesis H_0 is accepted. Therefore, the random effects model is selected for regression analysis. The regression results are shown in Table 4 below:

Table 4 Regression results under the fixed effect model

Variable	Coefficient	t-Statistic	Prob.
C	-0.152107	-2.2330121	0.0206
RGDP	0.758283	1.056498	0.2918
M1	-0.022682	-0.969974	0.3330
LOAN	0.015111	4.355582	0.0000
PCR	-0.002175	-2.872439	0.0044
PMI	-0.210869	-1.690201	0.0923
NIM	-0.001885	-2.096763	0.0370
R-squared=0.1352		Adjusted R-squared=0.1138	
F-statistic=6.33047			
Durbin-Watson stat=2.075235		Prob(F-statistic)=0.0000	

It can be seen from the above table that the model F value is 6.33047, which indicates that the model has a high degree of fitting, and the saliency is good, and the model is acceptable. Durbin-Watson stat=2.075235>R-squared is also sufficient to show that the regression equation is not a pseudo-regression. At a significant level = 0.05, the Prob of LOAN, PCR, PMI, and NIM were 0.0000, 0.0044, 0.0923, and 0.0370, respectively, both less than 0.1, and basically passed the significance test. The Prob of RGDP and M1 were 0.2918 and 0.3330, respectively, which were greater than 0.1, and did not pass the significance test.

Conclusion

Through empirical research, the results show that among the macro-level factors, the PMI has a significant negative impact on the non-performing loan ratio of commercial banks, while the total loan amount has a positive impact on the non-performing loan ratio. In the commercial bank management factors, Provision coverage and net interest margins have a significant negative impact on non-performing loans. Suggestions for solving the problem of non-performing loans of commercial banks can be given from the perspective of commercial banks at the macro and micro levels. At the macro level, we can prevent the emergence of non-performing loans by comprehensively promoting economic development, improving relevant laws and regulations, accelerating the pace of China's capital market construction, and optimizing the credit environment. At the micro level, we can prevent non-performing loans by strengthening the predictive analysis of macroeconomic operations of commercial banks, establishing a sound risk management system, improving the credit management system, and optimizing the business structure, through credit asset securitization, debt-to-equity swap and package sales. Non-performing loans and other means to dispose of existing non-performing loans. Thus solving the problem of non-performing loans in increments and stocks.

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