ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202206_5(6).0116

Influence of New Interbank Liabilities on the Credit Risk of Small- and Medium-sized Banks

Yang Liu[1, a], Mengyu Lin[2, b] and Nannan Ban[1, *]

[1]Surrey International Institute, Dongbei University of Finance and Economics, Dalian, China

[2]College of International Economics and Trade, Dongbei University of Finance and Economics, Dalian, China

*Corresponding author: n.ban@surrey.ac.uk, [a]gloriasii@163.com, [b]m18742055112@163.com

Abstract

Small- and medium-sized bank (SMB) is an indispensable composition in China's financial system which performs as the bridge of capital flow and provides information to people and institutions that require finance services. Thus, the safety of operation should be focused by the whole industry. As the liability businesses are vital source for gaining funds, SMBs have brought in innovative ways in raising capital, such as new interbank businesses. This paper focuses on analyzing the influence of new interbank businesses on SMBs' credit risk from the perspective of liability, taking the takeover of Baoshang Bank in 2019 as an example. Existed researches referring to the effect of interbank businesses mostly are from the view of assets and lack of specified investigation into SMBs. Having revealed the current dilemma of SMBs in China, this paper deepens the research in a special determinant of credit risk. Through reviewing previous literatures about interbank businesses and credit risk, a research model is designed to assure a specifying correlation between them. By collecting data from online official websites and databases, a data sample based on Z-score model is analyzed using Stata. Descriptive statistics and regression analysis are applied in the researching process. The experimental results are linked with the data showing the variation of internew in Baoshang Bank which contributes to the takeover, which alarms the hidden danger of inappropriate internew and the further impacts to the public. Finally, this paper points out the existing problems in the control system in the banking system and proposes suggestion respectively.

Keywords

New Interbank Liability; Small- and Medium-sized Bank; Credit Risk.

1. Introduction

1.1. Research Background

Liability business is an important source of funds for commercial banks. Interbank liabilities are debt businesses that rely on interbank deposits and interbank borrowing. The scale of interbank liabilities of listed banks has been increasing rapidly since 2009. From the beginning of 2009 to the end of 2013, the interbank liabilities including interbank deposits, borrowing funds and the sold financial assets under repurchase agreements increased by 236%, from 5.32 trillion yuan to 17.87 trillion yuan, which was 1.74 times and 1.87 times of the total liabilities and deposits for the same period respectively (China Financial Stability Report, 2014). From the data, the proportion of interbank liabilities has shown a volatile upward trend. This presents the needs of objective backgrounds and realistic requirements, but it can also render some issues on regulation and maturity mismatch.

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202206_5(6).0116

The scale of banks is commonly on the basis of the quantity of assets. SMBs, in China, refers to the national commercial banks, regional joint-stock commercial banks, and urban commercial banks (including urban credit cooperatives and rural credit cooperatives) except for the top five commercial banks of China. SMBs foster the development of finance and economy in china from two perspectives. On the one hand, it supports the development of a great number of small- and medium-sized enterprises (SMEs) and private economy through its flexible market sensitivity and efficient financial services. On the other hand, the innovation and revolution of financing regulations prompts China's marketization of finance.

However, lots of challenges exist in the market which plunge SMBs into dilemma. SMBs lack advantages in homogeneous competition, which the biggest competitors are wholly state-owned banks. They are positively shifting towards commercialization. The pace of reforms in both employment mechanisms and distribution systems has been further accelerated with gradually improving management capabilities. More importantly, a series of preferential policies issued by the government, such as non-performing loans, bad debt write-offs, and staff reductions which are all in a large number have gradually reduced the burden on the state-owned commercial banks which results in the enhancement of their vitality.

1.2. Research Questions and Objectives

The object of this paper is to explain the relationship between new interbank liabilities and credit risk in SMBs through the linear regression analysis, explore the determinants of credit risks by reading a large number of literature and analyzing Baoshang Bank's takeover and analyze the situations of relevant markets and the macroenvironment by observing the changes of data and implementations of strategies after the takeover of Baoshang Bank. As Baoshang Bank is the first SMB being taken over in recent decades which can be a timely alarming for other SMBs. Before going further into the research, there are three questions listed out: First, how does new interbank liabilities affect the trend of credit risks of SMBs in China? Second, what is the process of forming credit risks through new interbank liabilities? Third, what external effects did the takeover of Baoshang Bank bring in?

1.3. Significance of Research

The research focuses on the new interbank liability of SMB, a critical business activity of SMBs who are the indispensable parts of China's financing industry, whose variations have huge influence on SMBs' financial performances and external effects. Though couples of scholars have researched in the effects of increasing interbank business on banks, the majority of investigations implemented from the asset perspective. While this paper starts from the liability view to estimate the relative relationship and propose suggestion. On the one hand, it is in consistent with the result of some researchers that interbank businesses lead to a rising potential exposed to risks, with a more specific direction into credit risks and a creative perspective of the independent variable from the academic view.

On the other hand, the takeover of Baoshang Bank performs as a primary factor in reinforcing the management of SMBs and generating the market concern. All the stakeholders or players in the same industry desire to excavate the inside information in case of any unexpected dangers. This paper sheds light on the pushing of new interbank liabilities on this takeover as well as the subsequent influence and reform measures, which serves as an enlightenment for other SMBs from a practical view.

2. Literature Review

2.1. Interbank Business

Interbank business refers to the investment and financing of funds between commercial banks and other commercial banks or financial institutions, which includes both asset and liability

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202206_5(6).0116

activities. According to Notice on Regulating Interbank Business of Financial Institutions (2014), which was jointly issued by the People's Bank of China, the China Banking Regulatory Commission, the China Securities Regulatory Commission, the China Insurance Regulatory Commission, and the State Administration of Foreign Exchange, Interbank business includes interbank lending, interbank deposits, interbank borrowing, interbank payment, securities buying and sales return and other interbank financing and investing activities.

Till now, interbank liability activities have been distinguished into traditional and creative forms. Traditional interbank liability mainly occurs among commercial banks. It mostly adjusts the liquidity for short term, which includes interbank borrowing and deposit. The direct objective of traditional interbank liability is to ensure the supply of ready funds. While the creative interbank liability business enlarges the functions. In China, securities buying and sales return, interbank negotiable certificates of deposit and interbank finance management are principal items.

2.2. Credit Risk

Credit risk management is crucial for the banking industry especially facing financial crises (García, 2012). The scholar set up a model by a feat of a linear function to estimate companies' possibility of default. Bülbül (2018) pointed out that competitions of banks and concentration on various sectors in the loan market would determine the tools of credit risk management. Additionally, according to Anna (2015), credit risk management differs for companies operating in B2B or B2C market, including assessment of clients' creditworthiness and establishment of the rules for receivables management.

2.3. Relationship between Interbank Business and Credit Risk

As the development of finance industry steps into new stages around the world, traditional deposits and loans face great challenges in China which fosters the innovation of financial products and activities. Commercial banks seek for creative ways to enhance profit. Therefore, interbank businesses appeared in groups and expanded quickly from 2009-2013, which attracted a number of scholars study the phenomenon and the behind effects. Most people have drawn the conclusion that credit risk increase with the rising of interbank transactions. Xue (2016) showed that these businesses would bring in huge risks though they could be profitable, especially the outbreak of the credit risk due to the high leverage of the operation and risk contagion out of the capital linkage. Part of the hidden risk bearing and fund flowing lead banks to more vulnerable state rather than the superficial balancing, which is easily to induce systematic risks. Zhu (2017) added a new perspective of strong financial supervision and came to a similar result through reverse hypothesis approach. While other researches divided the interbank activities into two catalogues, which specifically compared different effects of traditional and creative ones. Gan (2017) claimed that traditional interbank lending and deposits would not increase credit risk, while the deposit certificate and other new interbank activities indeed generate the possibility of credit risk. Chen (2019) focused merely on the liability activities among the interbank market and investigated the impact of buying security and return sale. It has been testified that the credit risk would be raised as these kinds of businesses' accumulation.

2.4. Liability Management

Liability management plays a significant role in a bank for controlling risk level. Therefore, quiet a number of studies have focused on this subject and generated effective methods for managing liability issues. According to Zhuang (2018), the theory of liability management claims to ensure banks' demand of liquidity by liability activities. It transfers the ideas from focusing on liquidity to liquidity, security and profitability, which enriches the managing perspective from asset management to liability management. Due to the change, banks enhance

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202206_5(6).0116

their flexibility and initiative. There are a lot of research analyzed liability management problems in different contests. Aguirre (2004) analyzed it before and during the banking crisis by observing key macroeconomic variables. Other researchers like Ogˇuzsoy (1997), DeYoung (2008) and Novickytė (2014) all studied on the asset and liability management (ALM). Ogˇuzsoy presented a multiperiod model for ALM under uncertainty. DeYoung used canonical correlation analysis to check on the changing relationship referring to asset and liability accounts. While Nbovickytė assessed the risk taking under ALM.

3. Methodology

3.1. Research Methods

This paper will use secondary data, Z-Score model, case study and regression analysis, which will be combined for both quantitative and qualitative analysis and responding to the research questions. The secondary data collected is from official websites and academic e-journals, such as Cnki.net, ScienceDirect, and Elsevier. Additionally, the quantitative methods used in this essay are mainly to investigate the influence of the amount of creative interbank business from liability perspective on the credit risk in Chinese small- and medium-sized banking industry. The qualitative methods will describe the results of the empirical research which will illustrate the phenomenon. Through the whole process, the relative indexes represented the extent of credit risk will be generated by the calculation of return of asset (ROA) and capital adequacy ratio (CAR). At last, these data will be processed by STATA.

3.2. Research Design

Since 2013, the traditional interbank liabilities have been widely applied and lots of innovation gradually emerged based on that. While the former was restrained in 2014 which induced SMBs focus more on the latter. As the time going forward, the issues referring to various participants and maturity mismatch has been exposed to the public, which may cause huge damages to the whole risk mechanism of financial institutions. Thus, this research makes a hypothesis as following:

H: The increase of creative interbank businesses from liability perspective will raise credit risk of small- and medium-sized banks in Chinese banking industry.

This paper takes Baoshang Bank being taken over as an example, the financial index from the balance sheet and income statement in the period of 2012-2017 and the reasonable prediction of 2018, such as assets, risk assets, liability, creative interbank liability, net income and equity, will be applied to form the variables of the model. The data collecting mainly plans to present the deterioration of the performance and finally lead to the taken-over situation. Additionally, the macroeconomic data are derived from Wind Database.

3.3. Choices of Variables

(1) Explained Variables

At present, the estimation of banks' credit risk is implemented through financial data. Referring to Ogˇuzsoy (1997), I choose Z-Score as the explained variable to assist the research. Z-Score is an indicator that is mostly used to predict the possibility of bankruptcy or financial crisis of a company.

The formula of Z-Score: (μROA+CAR)/ σROA

μROA refers to mean of return on bank assets, CAR refers to ratio of own capital to total assets, the relative information can be obtained from annual reports of the bank. Z-Score represents the income and capital compensation that a unit of commercial bank risk assets can bring to the bank. When a unit of risk assets brings more returns and capital compensation, the larger the Z-Score, the lower the bankruptcy risk that a commercial bank face.

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202206_5(6).0116

(2) Explanatory Variable

The explanatory variable of this model is mainly internew, which represents innovation interbank liabilities as a percentage of total liabilities. The sum of creative interbank liability can be gained by adding up buying securities and return sales and interbank wealth management.

(3) Control Variables

As the degree of macroeconomic development, easing of market liquidity, bank's profitability, bank's asset-liability structure and operating efficiency all affect the risk level, I use the growth rate of GDP, the growth rate of M2, total assets profit rate, debt to asset ratio, and net interest spread as control variables.

Table 1. Variable Settings

Variable Name	Abbreviation	Explanation	Source
Bankruptcy risk	Z-Score	(μROA+CAR)/ σROA	Annual reports
Innovation interbank liabilities as a percentage of total liabilities	Internew	(Buying securities and return sale + interbank deposit certificate + interbank wealth management)/Total liability	Wind database, annual reports
Growth rate of GDP	GDPGR	Different form of gross national production	Wind database
Growth rate of M2	M2GR	Logarithmic form of total M2	Wind database
Total assets profit rate	Asset_profit_margin	Total profit/Average total assets	Annual reports
Debt to asset ratio	Asset_liability	Total liability/Total assets	Annual reports
Net interest spread	NIS	Net interest income/Total assets	Annual reports

3.4. Construction of the Model

$$Zscore_t = \alpha_0 + \alpha_1 Internew_t + \alpha_2 GDPGR_t + \alpha_3 M2GR_t + \alpha_4 Asset\_profit\_margin_t + \alpha_5 Asset\_liability_t + \alpha_6 NIS_t + \varepsilon_t$$

$_t$: time zone

$Internew_t$: the scale of creative interbank liability in the t time zone

$GDPGR_t$: the growth rate of GDP at t period

$M2GR_t$: the growth rate of M2 at t period

$Asset\_profit\_margin_t$: the total assets profit rate at t period

$Asset\_liability_t$: the debt to asset ratio at t period

ε_t: random error term

4. Analysis of the Empirical Research

4.1. Descriptive Statistics

The sample data of this research is excerpted from the annual reports of Baoshang Bank in the period of 2012-2017, National Bureau of Statistics and Kuai Yi Wealth Management. It will use linear regression to analyze the data.

The following table is the information of variables in the period of 2012-2017:

Table 2. Information of Variables

Year	Z-Score	Internew	GDPGR	M2GR	Asset_profit_margin	Asset_liability
2012	116.0778	0.0364	0.0790	0.1439	0.0326	0.9139
2013	84.7502	0.0165	0.0780	0.1359	0.0310	0.9203
2014	79.1256	0.0094	0.0730	0.1101	0.0302	0.9282
2015	85.8600	0.0885	0.0690	0.1334	0.0316	0.9256
2016	82.3957	0.1601	0.0670	0.1133	0.0287	0.9310
2017	66.7646	0.1522	0.0680	0.0811	0.0215	0.9453

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202206_5(6).0116

The table presents that all the control variables fluctuate gently through the six years. Z-Score plunges in 2013 and 2017 respectively, and leads to a total decreasing trend. The creative interbank liability spurts since 2015, which changes exactly opposite to Z-Score by the direct data observation.

The following table is the descriptive statistics of the main variables:

Table 3. Descriptive Statistics of the Main Variables

Variables	Mean	Standard deviation	Minimum	Maximum
Z-Score	85.8290	12.9239	66.7646	116.0778
Internew	0.0772	0.0613	0.0094	0.1601
GDPGR	0.0723	0.0047	0.0670	0.0790
M2GR	0.1196	0.0210	0.0811	0.1439
Asset_profit_margin	0.0293	0.0037	0.0215	0.0326
Asset_liability	0.9274	0.0097	0.9139	0.9453

During 2012-2017, the Z-Score of Baoshang bank varies from 66.7646 to 116.0778 and the standard deviation of it reaches 12.9239, which means the bank assumed various degrees of risk in different years, and fluctuated significantly. The proportion of creative interbank business at the range of 0.94% and 16.01%, which shows the amount of buying securities and return sale and interbank deposit certificate increased sharply. Meanwhile, it illustrates the bank transferred passive liability into more active liability.

4.2. Regression Analysis

Table 4. Regression Results of Baoshang Bank

Explained Variables	Coefficients
Internew	-867.9962***
GDPGR	-228.036***
M2GR	-688.0181***
Asset_profit_margin	-41380.41***
Asset_liability	-22362.09***
cons	23833.88***

p.s. *** indicates the significance level under 1%

As the results list above, the regression coefficient is -867.9962, which interprets that internew has a strong negative correlation with Z-Score and the research rejects null hypothesis at 1% significance level. Z-Score will sharply decrease with the rising of internew, which can be observed more directly on the following line chart.

According to Table 2, generally the proportion of creative interbank business enhances from 2012 to 2017, which induces the number of Z-Score. The peak is at 2012 which is 116.0778 with a low internew, and the lowest point is 66.7646 at 2016 with a high internew comparatively.

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202206_5(6).0116

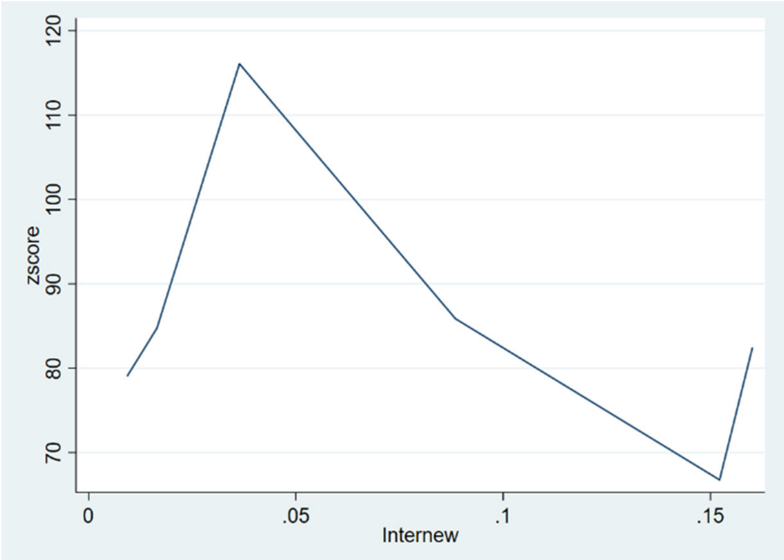

Figure 1. Relationship between Z-Score and Internew

5. Discussion based on the Takeover of Baoshang Bank

5.1. Introduction of Baoshang Bank

Baoshang Bank was established in December 1998, which was the first joint-stock commercial bank set up in Inner Mongolia Autonomous Region. The small business loan of Baoshang Bank is committed to tackling the financing problems of small and medium-sized enterprises, and providing financial support for individual industrial and commercial households and small enterprises demanding capital (Baoshang Bank Official). However, due to severe credit risk, Baoshang Bank was taken over which is also the first commercial bank to be taken over by a regulatory agency after Hainan Development Bank was announced by the People's Bank of China in 1998. From the start of the takeover, the takeover team has fully exercised the management rights of the contractor bank, and has entrusted the construction bank to custodian the contractor's banking business.

5.2. Discussion on Baoshang Bank's Creative Interbank Liability

Interbank liabilities can expand the overall balance sheet of the financial industry, giving institutions the ability to hold more assets. That is, for many small- and medium-sized institutions, interbank liabilities will facilitate them get rid of the restrictions of outlet channels and achieve scale expansion, not just the product of bond bull market or arbitrage in a low interest rate environment. Though these businesses facilitate funds allocating, massive accumulation will kill the entity. By observing the changing data of Baoshang Bank, the hidden danger can be revealed.

Buying security and return sale steadily fluctuated during the periods which just made up less than 2% of the total liabilities except 2012. It is not the main body of the internew. While the interbank deposit certificate presents a completely opposite trend. Since 2014, Baoshang Bank begun to the business of issuing this kind of certificates and it can be seen a dramatic growth from 2014 to 2016. Compared with data of internew (See in Table 4-1), it almost occupies over 90% of the new interbank liabilities. Combined with the regression analysis, the rising of interbank deposit certificate leads to the high ratio of internew, which will result in a low value of Z-Score. Lower the Z-Score, more severe credit risk will be generated which will augment the potential of bankruptcy. The takeover of Baoshang Bank aims to control the risk contagion in case of affecting the whole microfinance system. Specifically, due to the acceleration of economic financialization and financial marketization, the significant position of commercial

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202206_5(6).0116

banks' main financial intermediaries has been relatively reduced, and the part of savings assets in social financial assets has seen a continuous declination. This phenomenon which is called financial disintermediation renders the appearance of creative means to collecting funds. Therefore, Baoshang Bank increases the issue of interbank deposit certificate. However, as the source of funds of Baoshang Bank relies heavily on interbank market borrowing funds, the long timing of lending and the short timing of borrowing will easily cause serious term mismatch. Coupled with the downward fluctuation of the economic cycle, it will easily cause the cost of capital use of Baoshang Bank remains high.

5.3. Impact of the Takeover

5.3.1. Impact on Bond Market

Firstly, it attacks the short-term liquidity. As monetary fund is one of the main investment entities for interbank certificates of deposit, its holders may redeem currency funds due to concerns over the credit risk and valuation risk of the certificates of small- and medium-sized banks. Money fund itself is the supplier of funds, and its increasing redemption pressure will reduce the supply of funds. Additionally, Baoshang Bank’s interbank deposit certificates due payment, repurchase transactions, secondary circulation of certificates of deposits, etc. may be blocked, resulting in higher liquidity pressure on the creditors and counterparties of Baoshang Bank. It will pass to other relevant institutions, thereby forming a chain reaction.

Secondly, it renders overreaction or allocation opportunities, which means interest rate debt and high-grade credit debt may be accidentally affected. As this event has tightened market liquidity, to ease liquidity pressure, institutions often sell interest rate bonds with better liquidity, which leads to the rapid rise in the yields of interest rate debt and high-grade credit bond. In fact, this is a temporary and unexpected phenomenon. With the stabilizing of liquidity and fading of panic, the yield returns to normal.

5.3.2. Impact on Economy and Capital Market

(1) Break the Rigid Redemption

Due to the existence of financial rigid redemption, the debt growth rate of Chinese commercial banks is consistent with the nominal GDP growth rate. Meanwhile, as liabilities and assets are positive correlated that the total assets of commercial banks also present a higher growth rate, which has led to the accumulation of leverage in the real economy. Regarding the debts of Baoshang Bank, the public creditors and interbank institutions may not be fully repaid on time. This is also the first substantial default case since the issuance of the interbank certificates of deposit, which breaks the commercial bank's rigid redemption and is conducive to reducing currency growth and real economy lever.

(2) Optimize Financial Supply

The takeover alarms the market and management institutions. Supervision attaches more importance to the disposal of high-risk financial institutions, and has repeatedly proposed to dispose of high-risk financial institutions on different occasions. In the future, supervision will strengthen the disposal of high-risk financial institutions. Financial institutions will have a “normal phase-out.” A trigger mechanism may be established through restructuring or mergers and acquisitions, when financial institutions meet certain standards such as insolvency and not able to continue operations, etc. In the long term, it will be beneficial for optimizing service quality by bringing funds to truly effective areas and benefit the real economy and capital markets.

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202206_5(6).0116

6. Suggestions on Liability Management and Risk Prevention

6.1. Recommendations to SMBs in China

6.1.1. Sustain the Bottom Line

The use of funds collected from interbank businesses is restrained that only for the temporary lack of liquidity, which cannot be applied bridge the gap between credits of different periods or investment on fi assets. All the SMBs should obey the rule in case of any potential risks. Besides, the types of interbank liabilities and accounting are supposed to under more tensely control, which aims to add transparency to the business processes and strengthen the internal management. The basic regulations are the bottom line for SMBs which cannot be overpassed.

6.1.2. Establish Healthy Relationship with the Government

The government especially local governments should eliminate the idea of regarding SMBs as coffers that they would offer loans to the state-owned enterprises without any condition. It will damage the liability structure by the hidden debts just for political achievements. The government should act as an encourager to support SMBs make up the capital by bringing in strategic investors, issuing bonds and restocking, which will foster CAR to meet regulatory requirements as soon as possible. It will basically enhance resilience to risks. Apart from these actions, the government also needs to cooperate with the central bank and the banking regulatory commission to adopt measures on SMBs with severe credit risks, which prevent regional financial risks evolved into systemic financial risks.

6.1.3. Improve the System of Liability Management and Risk Control

In the first place, SMBs should always follow the industry trends that the volume and form of liability business should be defined in consistent with profitability and capital quality. Meanwhile, the control of interbank business supposes to be strengthened in case of severe term mismatch which eliminates risks from the roots. Additionally, it is necessary to apply advanced technologies in the service expansion and management processes. At present, SMBs mainly take diverse ratios as management methods which lack personalized requirements of debt indicator and full quantitative analysis capabilities. SMBs can use big data covering all aspects of production and operation, social networking, and consumer travel to classify customers and provide targeted services.

Secondly, establish a comprehensive risk management system to achieve effective integration with liability management. Liability management is a basic mean among bank risk management. It's an important cornerstone of the construction of a comprehensive risk management system, covering the management on the risk of credit, liquidity and interest rate. The priority is to continuously improve the ability of pre-judgment on the external environment and enhance the ability to manage interest rate risk of bank books. Through comprehensive analysis of macroeconomic trends and monetary policy to analyze and forecast market interest rate trends, proactively adjust risk appetite and risk limits and the structure of liabilities, timely formulate countermeasures, and implement forward-looking management.

7. Conclusion

In conclusion, since Baoshang Bank was taken over, an increasing number of debates on the development of SMBs in China appear. This paper launches the result that the potential of credit risk will increase with the rising of the proportion of new interbank business by linear regression analysis using Baoshang Bank's data. Specifically, Z-Score of Baoshang Bank dramatically dropped, while internew presented a continuous growth. The case is applied to achieve the main purpose of this paper and also provides implications for the whole industry.

Both banks themselves and governments should take actions for the further defense of risks and improvement of relevant systems.

As there are no access to gain the annual reports of Baoshang Bank for the year of 2018 and 2019, it's not completely accurate of the result which is one limitation of this study. However, the total direction is consistent with the analysis. Furthermore, as Baoshang Bank is the only takeover of commercial banks since 1988. Though the result will alarm the industry, the sample selection can be enriched in the further researches.

References

[1] (2019, 5 24). Retrieved from The People's Bank of China: http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/3834025/index.html

[2] Aguirre, M. S. (2004, 2 25). Japanese banks liability management before and during the banking crisis and macroeconomic fundamentals. Journal of Asian Economics , pp. 373-397.

[3] Anna, S. (2015). Impact of credit risk management. Procedia Economics and Finance, pp. 325-331.

[4] Altman, E. (1968). Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy.

[5] Aydemir, R. (2016, 8 22). How do banks determine their spreads under credit and. Journal of International Financial, pp. 147-157.

[6] Bank. (2018, 3 9). Retrieved from China Industry Information Web: http://www.chyxx.com/industry/201803/617269.html

[7] Baoshang Bank Official: http://www.bsb.com.cn/

[8] Bluhm, M. (2018, 4 10). Persistent liquidity shocks and interbank funding. Journal of Financial Stability, pp. 246-262.

[9] Bülbül, D. (2018, 11 14). What influences banks' choice of credit risk management practices? Theory and evidence. Journal of Financial Stability, pp. 1-14.

[10] Chamizo, A. (2020, 1 7). Looking through systemetic credit risk: Determinants, stress testing and market value. Journal of International Financial Markets, Institutions & Money.

[11] Chen, L. (2019, 4). Impact of Interbank Business on Commercial Bank's Risk. Shang Hai, China.

[12] China, T. F. (2014). China Financial Stability Report. Beijing: China Financial Publishing House.

[13] DeYoung, R. (2008, 9). On the independence of assets and liabilities: Evidence from U.S. commercial banks, 1990–2005. Journal of Financial Stability, pp. 275-303.

[14] Ekinci, R. (2019, 9 979). The Effect of Credit Risk on Financial Performance of Deposit. Procedia Computer Science, p. 987.

[15] Gan, Y. (2017, 4 10). Study on the Influence of Interbank Business on Risk Taking of Commercial Banks . Chang Sha, Hu Nan, China.

[16] García, F. (2012, 3 5). Credit risk management: A multicriteria approach to assess creditworthiness. Mathematical and Computer Modelling, pp. 2009-2015.

[17] Ghenimi, A. (2017, 5 29). The effects of liquidity risk and credit risk on bank stability: Evidence from. Borsa Istanbul Review, pp. 238-248.

[18] Gu, Z. (2008, 5 1). Empirical Analysis of Factors Affecting Profitability of Commercial Banks. Hang Zhou, Zhe Jiang, China.

[19] Gulati, R. (2018, 11 20). WhatdrivescreditriskintheIndianbankingindustry?An empiricalinvestigation. EconomicSystems, pp. 42-62.

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202206_5(6).0116

[20] Huang, D. (2017). Economies of Money and Finance. Beijing: China Renmin University Press

[21] Jiménez, G. (2003, 12 24). Collateral, type of lender and relationship banking as determinants of credit risk. Journal of Banking & Finance, pp. 2191-2212.

[22] Lin, S. (2014, 8 20). New Changes, Impacts and Suggestions in the Interbank Depository Market. China Bond, pp. 44-50.

[23] Lu, S. (2017, 12 23). Finance. Retrieved from Sohu: https://www.sohu.com/a/212341143_739558

[24] Mishkin, F. S. (2016). The Economics of Money, Banking, and Financial Markets. Beijing: China Renmin University Press.

[25] Novickytė, L. (2014). Assessment of banks asset and liability management: problems and perspectives (case of Lithuania). Procedia - Social and Behavioral Sciences , pp. 1082-1093.

[26] office, G. (2014, 5 16). Highlights Guide. Retrieved from China Banking Regulatory Commission: http://www.cbrc.gov.cn/chinese/home/docView/3DBE878188824F4498904542A69A3C1B.html

[27] Ogˇuzsoy, C. B. (1997, 11 1). Bank asset and liability management under uncertainty. European Journal of Operational Research, pp. 575-600.

[28] Pasiouras, F. (2008). Estimating the technical and scale efficiency of Greek commercial banks: The impact of credit risk, off-balance sheet activities, and international operations. Research in International Business and Finance, pp. 301-318.

[29] Reuters. (2019, 6 12). Retrieved from Chinese Finance: Interbank deposit certificates were issued to nearly 200 billion yuan on Tuesday, the highest in a single day after the takeover of Baoshang Bank: http://www.fx361.com/page/2019/0612/5195384.shtml

[30] Song, Z. (2017, 1 27). Lending technology and credit risk under different types of loans to SMEs: Evidence from China. Retrieved from http://dx.doi.org/10.1016/j.iref.2018.02.012

[31] Wind Database: https://www.wind.com.cn/en/edb.html

[32] Xia, D. (2017, 10). The Impact and Enlightenment of Strong Financial Supervision on Interbank Financial Management Business. China Urban Finance, pp. 33-36.

[33] Xue, L. (2016, 6 16). The Development of Interbank Business in China and Research of its Risks . Beijing, China.

[34] Zheng, X. (2018). Research on the Latest Development and Risk of China's Interbank Business. Huabei Finance, pp. 46-52.

[35] Zhu, L. (2017, 12). Research on Interbank Business and Effects of Bank Risk from Diverse Perspectives. Zhe Jiang, China.

[36] Zhuang, Y. (2018). Commercial Banking and Operations. Beijing: China Renmin University Press.