

A Hierarchical Study on the Efficiency of the City Commercial Banks in China

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Abstract—City commercial banks have become an important pillar of the banking system in China. Data Envelopment Analysis (DEA) is used to study the efficiency of city banks at this paper, and evaluate the effects of four indicators profitability, liquidity, security and sustainability on bank efficiency. This paper divides Chinese City Commercial Banks into three categories according to their asset scale and selects those ranking top for analysis. After the regression for all observers, two dummies representing different capital scale are significant, which indicates the effect of data category. Liquidity is significant and higher liquidity leads to lower efficiency. After that, regressions are conducted on banks in different categories respectively. For banks with asset size larger than 100 billion, sustainability indicator is significant. For banks with asset size between 50 billion and 100 billion, liquidity and sustainability are significant. For banks with asset size between 30 billion and 50 billion, profitability is more important in determining efficiency. The paper puts forward some policy suggestions also.

Keywords—city commercial banks; hierarchical efficiency; data envelopment analysis; policy suggestion

I. INTRODUCTION

According to the 2011 annual report published by China Banking Regulatory Commission, up to the end of 2011, China's banking financial institutions consist 3 policy banks, 5 large-scale commercial banks, 12 joint-equity commercial banks, 144 city commercial banks. Thus it can be seen that the commercial banks accounted for almost 50% of the amount of all the banks, and therefore have a pivotal position in China's financial system.

There are quite a few city commercial banks, though they have small market shares. Because of geographical characteristics, most of these banks regard community serving, citizen serving, offering financial service to urban economy and medium-sized and small enterprises as their foothold, and play an positive role in accelerating the growth of local economy, easing employment tension, bringing convenience to the masses life, and particularly, promoting the development of local medium-sized and small enterprises. For the past few years, with the economic development and the expansion of their own strength, the functional position of city commercial banks, only serving the local urban finance, has

changed. A new round of restructuring and reorganization has been implemented by some well-managed city commercial banks, such as bringing in strategic investor, being listed in capital market, perfecting corporate governance structure, and running cross-regional business.

Nevertheless, there is still a gap between city commercial banks and their domestic peers. Due to the reasons of history, institution, and environment, a big gap still exist between city commercial banks and other domestic commercial banks in operation strategies such as market segmentation, product development, and operation principles. Many local governments gave aid to local city commercial banks for sake of the stability of local financial market. However, on a long view, if only the city commercial banks want to keep on operating, they must improve their own efficiency. For this reason, this text studies the factors have effect on China's city commercial banks' efficiency, and then analyses the efficiency determinant of city commercial banks of different asset sizes, gives advice to them for their development, which makes great realistic significance on promoting the operation efficiency of city commercial banks and even China's financial system.

II. LITERATURE REVIEW

Ajagbe and FA (2009) studied all of the community banks in Ogbomoso, and committed a questionnaire survey on 200 borrowers. They did research on the effects on the community banks' efficiency made by the size of the loans, the interval between loan application and origination, and the interest rate and loan types, and drew a conclusion that banks with more liquid assets have higher efficiency. With CAMELS ranking index, including ROE, net interest for loans ratio, the capital asset ratio, the liquidity ratio, Fred H. Hays (2009) modeled to evaluate the efficiency of the community banks, whose degree of accuracy can reach 88%-96%. Jianhua Zhang's (2012) study on data of 133 Chinese city commercial banks during 10 years indicated that the health of local law environment contributes to the promotion of the profit efficiency. Yamori's (2011) empirical study on China's city commercial banks shows that the local economy growth makes negative effects on the city commercial banks' profit efficiency, and believes that the local government's hierarchy

of control and internal governance structure can give explanation to this phenomenon. This article advises the local economy growth rate should be slowed down to promote the performance of the city commercial banks substantially.

This article, however, makes improvement on the existing studies in the two following aspects. Firstly, the sample stratification has not been committed in all of the existing studies, so their conclusions can hardly be typical. Therefore, the sample stratification becomes the primary issue this article is going to solve. Secondly, a prevalent problem of the evaluation on China's commercial banks' efficiency now is the overweighed current financial index in the evaluation index system. The current value has been emphasized while long-term value has been neglected, as a consequence, the level of sustainable development failed to be assessed. This article, however, combining with expansibility, develops an evaluation index system of commercial banks through these four aspects.

III. METHODOLOGY AND MODELING

Data Envelopment Analysis (DEA) used by this article is an efficiency evaluation method which applies to a decision making units with multi-output and multi-input. It has been created by Charnes and Cooper in 1986 to evaluate performance in expansively different field. As it can transform different kinds of input and output into the numerator and denominator of the efficiency ratio without calculating them in the same monetary unit, there is no need for it to calculate the standard cost of every service item. As a consequence, the combination of input and output can be described clearly by measuring efficiency with DEA. Therefore, it is more comprehensive and reliable than a set of operation ratios or profit indexes.

The specific empirical model developed by this paper is:

$$dea = \beta_0 + \beta_1 netir + \beta_2 crr + \beta_3 car + \beta_4 nir + \beta_5 size2 + \beta_6 size3 \quad (1)$$

The symbols of the independent variables and the dependent variable are:

Table1.Symbols of the Indicators

Classification Indicators	Evaluation Indicators
Profitability Indicator	Net Interest Income and Operating Income ratio (netir)
Asset Liquidity Indicator	Cash Reserve ratio (crr)
Security Indicator	Capital Adequacy ratio (car)
Is Asset Size between 50-100 billion	Dummy Variable size2
Is Asset Size between 30-50 billion	Dummy Variable size3
DEA Indicator	Dea

where the dummy variables are used to stratify the sample into

3 levels by asset size. β_5 indicates the higher level of efficiency that the banks of the second layer(50-100 billion) are at when compared with the banks of the first layer(over

100 billion), while β_6 indicates the difference between the third layer and the first layer.

At the same time, in order to reflect the effect of various explaining variables on the dependent variable, this paper normalized every independent variables except for the dummy variables, avoiding that the value of β be affected by the factors such as the unit of explaining variables and different explaining variables' incidence on dependent variable can hardly be analyzed by comparing the β s directly.

If it is indicated that both of the dummy variables are statistically significant in the regression on all the samples, this paper will then regress the samples in the three layers respectively. The regression model is as follows:

$$dea = \beta_0 + \beta_1 snetir + \beta_2 scrr + \beta_3 scar + \beta_4 snir \quad (2)$$

The data this paper used is from the annual report of those sample banks.

Four indicators (the Profitability Indicator, the Liquidity Indicator, the Security Indicator, and the Sustainable Development Indicator) are used in this paper to complete the empirical study. And according to their characteristics, assumption that there is positive relationship between these four kinds of indicators and the efficiency of the banks has been made

IV. CONCLUSION

As for the city commercial banks generally, CRR, SIZE2 and SIZE3 are significant at 5% confidence level. The better the liquidity it has, the lower the efficiency of the bank is, and the smaller the asset size, the higher the efficiency. And at the same time, the last year's level of efficiency also has a positive effect on this year's. On the contrary, indicators like NETIR, CAR, NIR are not significant.

The result of the stratification is: the empirical study about the banks with an asset size of 100 billion shows that the development indicator is more important to the banks' efficiency. The regression result of data related to banks with an asset size between 50 and 100 billion shows that the asset liquidity indicator and the sustainable development indicator have a significant effect on bank's efficiency. Whereas the conclusion that the profitability indicator affect the bank's efficiency more significantly is drawn when it refers to city commercial banks with an asset size between 30 and 50 billion.

The study shows that because of the aid given to the city commercial banks by the government, many local government with good benefit will preferentially consider the city commercial banks, which brings the city commercial banks good benefit too, while the factor of the stuff quality input that related to the city commercial banks themselves has nothing to do with it. In addition, merger and acquisition is the trend of Chinese government's rectifying and developing the city commercial banks. However, at present, the most common method to revolutionize the city commercial banks is to remove the bad assets and to inject high-quality assets. By this way, the result of profitability indicator will be highly optimistic. But since the whole operation mechanism of the

banks has not been changed, the higher value of profitability indicator fails to reflect better efficiency. Meanwhile, since the city commercial banks are usually propped up by the government, if a corporation obtains loans from a joint-equity bank and a city commercial bank simultaneously, to maintain good relationship with the government, it will preferentially guarantee the loans from the city commercial banks. As a consequence, this will reduce the proportion of the city commercial bank's bad debts, lessen its loss, and increase its rate of return, which, however, is not the result of the high efficiency of the city commercial bank itself. In order to improve the whole efficiency of China's city commercial banks, the government should guide the banks to formulate reasonable reserves level and do good job in preventing risks.

V. FURTHER RESEARCH DIRECTION

The international financial situation is Currently complicated and full of uncertainty which impose large risks and challenges on most countries. China is not an exception. We can clarify the uncertainties into six aspects:

First of all, many counties recently lower the interest rate further. Meanwhile, the international financial market is watching closely to the main developed economies' inclination to their monetary policies, especially whether the Federal Reserve will abandon the quantitative easing policy and its'pace and strength of withdraw. This, as a consequence, makes up the most notable contradiction in the recent international financial market. The correspondant market uncertainty lies in when the Fed will withdraw of the quantitative easing policy and the pace and strength of it.

Secondly, at present, a large number of hot money flows into developing countries from the international capital market, and exerts great pressure on the emerging market economies including China. Once the central banks of developed economies, especially the Fed, adjust their quantitative easing policy, the capital flow will take a dramatic change instantly. All those exactly reflect the extreme uncertainty of hot money in the international capital market.

Thirdly, the bond yield of the present international financial market, particularly the treasury bonds return rates of major countries are historically low. National debt, as a risk-free investment option, has great appeal to quite a few investors. Although the yield is pretty low, the investment demand for government bonds is still high. Besides, the quantitative easing policy add fuel to the already high demand. However, once American and other western countries' quantitative easing policy alters, the price of government bonds will fluctuate violently, which directly makes up the

contradiction in the bond market, and leads to the third uncertainty that the bond market trend is hard to predict.

Fourthly, while for the main economies, the disposal of the banks which are too big to fail is still pending, some economies is confronting the fragmentation of financial business. This constitutes new contradiction, thus increases the uncertainty to the development direction and business operation of transnational finance institutions.

Fifthly, both the International Financial Stability Board and the Group of Twenty claim a lesson be drawn from the international financial crisis, Basel Accord III be implemented, and the bank capital adequacy ratio be improved. At the same time, the impact and harm of shadow bankings are becoming more and more evident. All of these constitute the supervision contradiction between on-balance-sheet and off-balance-sheet activities, which incur the uncertainty of the efficiency of the bank supervision.

Sixthly, while there is sufficient liquidity in the present international financial market, the demanded capital of the real economy is not guaranteed. On the one hand, great liquidity exists in capital market . On the other hand, the real economies, especially medium-sized and small enterprises, urgently need support but lack of fund. This proves to be the contradiction between the prosperity of the capital market and the sluggish of the real economy, which reflects the uncertainty of the revival of the global economy.

In fact, The number of city commercial banks accounted for more than half of China's banks, As a important pillar, we must pay attention to the economic background, and solve problems.

REFERENCES

- [1] Z. Xiaoyan, "China's Urban Commercial Banks: Recent Development and Profitability Analysis".China economic issues. Dalian China, Vol.7, pp.1-15, July 2007
- [2] A. Berger,and D. Humphrey, "Efficiency of Financial Institutions: International Survey and Directions For Future Research". European Journal of Operational Research, USA, Vol. 8, pp. 175-212, August 1997
- [3] J. Zhang, P. Wang, and B. Qu, "Bank risk taking, efficiency, and law enforcement: Evidence from Chinese city commercial banks". China Economic Review, Beijing China, Vol. 23, pp.284-295, November 2012.
- [4] S. Jianjun, Y. Nobuyoshi, "The Impact of Local Economic Growth on Bank Profits Efficiency: Evidence from City Commercial Banks in China". SSRN Working Paper, Stanford USA, Vol. 9, pp. 175-212, December 2011.
- [5] F. Ajagbe, A. Aworemi, and J. Ajetomobi, "Efficiency of Community Banks in Nigeria: A Case Study of Community Banks in Ogbomoso Zone of Oyo State", Interdisciplinary Journal of Contemporary Research In Business, Vol. 9, pp. 8-14, September 2009.
- [6] F. Hays, A. Stephen, D. Lurgio, and A. Gilbert, "Efficiency Ratios and Community Bank Performance", Journal of Finance and Accountancy, Florida USA, Vol. 5, pp. 34-49, May 2009.