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## Why do Chinese banks go all out to grow larger?

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### ABSTRACT

The objective of this study is to explain why almost all Chinese banks are going all out to grow larger. They try to increase their size by attracting more deposits. The study has important policy implications since the financial authority hopes to let banks to serve small and medium-sized enterprises (SEMs), which banks are reluctant to do so. The innovation of this study is to use most updated data to disclose the causality between bank size and bank performance. This paper argues that the monopoly position of the entire banking sector in China explains the behavior of Chinese banks. Only when private investors are allowed to enter the banking industry will some banks have no interest to grow larger and have interest to serve SMEs.

### KEYWORDS

Asset size; Commercial banks; China; Profitability; State monopoly.



## INTRODUCTION

This paper attempts to explain why almost Chinese banks are going all out to grow larger. Since the commercialization reform of Chinese banks from the mid 1990s, and especially the listing of 16 commercial banks on the stock exchanges, great changes have taken place in Chinese banking sector. Together with China's economic expansion, almost all Chinese banks have grown larger. Moreover, "Since China launched its sweeping economic reform, although state intervention in many sectors of the economy has been substantially reduced or eliminated entirely, the state continues to play a dominant role in the financial sector"<sup>[1-2]</sup>.

Given market structure and ownership structure, traditional economic theories suggest that in many industrial production processes, within a relevant range, the larger the firm, the lower the average cost will be. That is, industrial productions tend to exhibit significant economies of scale over relevant range of output. So does the effect of economies of scale also exist in the banking industry? Our intuition and common sense would say yes, but they are not enough, evidence is needed to answer the question. A distinguishing feature of Chinese commercial banks is their fast growing size. Chinese commercial banks are also quite different with size, which is usually measured by value of total assets. Our natural idea is to test whether size is a key determinant of profitability of Chinese commercial banks. Our hypothesis is that size must have a significant effect on the profitability of banks; otherwise banks would have no incentive to grow larger and larger.

## LITURATURE REVIEW

A positive relationship between bank size and profitability should be expected if there is significant "economies of scale" effect in the banking industry, and many previous studies have proved that<sup>[3-5]</sup>. Literatures in this field, however, fail to reach indisputable conclusions. One study, for example, finds that there was a negative relationship between size and profitability of American banks in the early 1990s<sup>[6]</sup>. Some study reports that from 1993 to 2002, large banks and small (community) banks in the U.S. achieved quite comparable profit margins, measured by ROA<sup>[7]</sup>. In a word, the impact of size on bank performance remains inconclusive, depending on different samples used.

Regarding bank size and bank performance, studies on Chinese banks do not arrive at consensus either. One study concludes that "in China, unlike in other developing countries, the size of the bank is not correlated with their performance. Mid-size national joint-stock banks perform considerably better than the Big Four banks and smaller city commercial banks."<sup>[2]</sup> That is to say, they find an inverse-U shaped relation between bank performance and bank size in China. Other studies, however, find that large banks in China have no worse performance, if not better, than small and medium-sized banks by using more recent data. It argues that large banks have more opportunities to finance large government infrastructure projects, which are more profitable and less risky<sup>[8]</sup>.

The contribution of the present paper is to use the most updated data to test the effects of both ownership structure and size on profitability of Chinese commercial banks. Dramatic changes have taken place in China's banking sector, for example, some banks have been listed on the stock exchanges. These changes must have affected banks' behaviors, thus affect their profitability. This paper will reexamine the effect of government policy on bank profitability, and explain many observed behaviors of Chinese banks. The motivation to conduct this study is based on a belief, that is, the effect of one variable on the other depends on specific institutional environment. So when the institutional environment is changing rapidly, we must reexamine the causality with new evidence. In this way, we can gain new insights about institutional change and from the observed phenomena.

## DATA AND VARIABLES

Foreign banks excluded, Chinese commercial banks are classified into four groups: (traditionally) state-owned commercial banks (SOBs), nationwide joint-stock commercial banks (JSBs), city commercial banks, and rural commercial or cooperative banks; they are mutually exclusive and collectively exhaustive (see Appendix B for a summary of the whole Chinese banking system). One might argue that the separation of SOBs and JSBs is pointless because they are now all joint-stock commercial banks. The separation has been continued to use due to several reasons. First, it has become a convention attributable to their histories; SOBs had been wholly state-owned since their birth. Second, compared with JSBs, SOBs assume more responsibility for maintaining macroeconomic stability (say, inflation) and promoting economic growth, and the degree of government intervention is much less in JSBs than in SOBs. Third, "the payment system and personnel management of JSBs is more flexible than those of SOBs that are set in line with other central government officials,"<sup>[9]</sup> and even their corporate cultures are quite different, in JSBs individual heroism is encouraged, while SOBs are more egalitarian<sup>[8]</sup>.

All the data used in this paper are from each bank's annual reports, which are publicized by them on their official websites, and all the annual reports have been audited and confirmed by independent accounting firms such as PWC before they are published. Because the commercialization reform of large state-owned banks started from late 1990s, and the reorganizing and restructuring of many city commercial banks started even later, so most banks have less than 10 years of data. Some banks can be traced back to as early as 1998, such as China Minsheng Bank, while some banks only have two years of data. On average, each bank has about five years of data. So the panel data set we have is an unbalanced one. The

period covered here is a unique one with far-reaching changes in China's banking industry. A market-oriented banking system has taken shape, and sixteen commercial banks have been listed on the stock exchanges during this period.

A natural question is: why not include more banks in the sample? The main problem is data availability. Previously data of banks could not be obtained from public sources. It was not until recent years did banks begin to upload their annual reports on their official websites. Even so, most small banks, especially those locate in underdeveloped regions still fail to disclose their data openly. Some banks do publicize their annual reports, but their reports are not audited by independent accounting firms; we don't want to increase data observations at the expense of data quality, so we choose not to include them in the sample. The sample contains 579 observations of all major commercial banks in China, and it is the best selection we can get at the date of this study being conducted.

So the 123 banks in the sample is not a randomly chosen sample. Altogether China has about 280 commercial banks of all types, 123 is not a big number among 280, but they represent the largest and most competitive and profitable banks in China. It is safe to say that the sampled banks represent the mainstay of Chinese banking sector.

A commonly used measure of banks size in the literature is total assets. A bank is large usually implies that it has a large asset size. Of course, we can use number of employees, total profits or net profits etc. to measure the size of banks; however, they are much less commonly used than assets size. It is reasonable to believe that these indicators have high correlation. The calculation shows that the correlation coefficient between total assets and number of employees is as high as 0.9595, and the correlation between total assets and net profits is even higher, 0.9871. Therefore, it is safe for us to use total assets to measure bank size.

Bank size varies greatly in the sample. As the aforementioned data show, the "Big Four" has accounted for nearly a half of the total assets of all the Chinese banking institutions. By the end of 2012, the largest bank in China is Industrial and Commercial Bank of China (ICBC), which has total assets of RMB17.5 trillion. Asset size of the "Big Four" all exceeds RMB10 trillion by the end of 2012. The smallest bank in the sample is Yingkou Coastal Bank, a city commercial bank in Liaoning province, with an asset size of RMB5.4 billion. This implies that the size of ICBC is 3241 times that of Yingkou Coastal Bank! The mean asset size in 2012 is around RMB1 trillion based on the sample.

Profitability is the dependent variable that we are going to explain in this paper. Profitability of a bank, as the name itself implies, means the ability of a bank to make profits. It should not be measured by an absolute value of output, say, total gross profit or net profit; it is best measured by a ratio, a revenue-cost relationship, because no profit is earned without any cost. In the literature, bank profitability is typically measured by "return on assets" (ROA) and/or "return on equity" (ROE). In this paper, besides ROA and ROE, we add another measure, "net profit per person," which is defined by "net profit divided by total number of employees." Here, ROE is accurately defined as "weighted average ROE."

We should emphasize here that profitability just indicates the ability to make profits, it says nothing about why it can make profits or how it makes profits. That is, profitability is not equivalent to efficiency or productivity. For example, a bank or firm has high profitability not necessarily because it is efficient or productive, may be because it is under the protection of the government, or it enjoys some preferential policies of the government. In the literature, many papers study determinants of bank efficiency or productivity<sup>[10-11]</sup> (Matthews & Zhang, 2010; Ariff & Can, 2008), what we focus on in this paper is profitability, which is a distinguishing feature of this paper. The three measures of profitability, namely, net profit per person, ROA, and ROE, are either directly reported by the banks in their annual reports, or can be easily calculated according to their definitions. All the three measures are related but different; they measure profitability from different perspectives.

**TABLE 1: Variables: names, definitions, and descriptive statistics**

Variables	Definitions	Mean	Std. Dev.	Min	Max
ROA	Return on assets (%)	1.09	0.51	-0.1	4.99
ROE	Weighted return on equity (%)	18.38	7.51	-1.69	60.84
Profit_per_peron	Log (Net profit per employee)	3.44	0.90	-4.61	4.95
State	Percent of state share (%)	28.16	24.56	0	100
Size	Log (Value of total asset)	11.47	1.79	8.10	16.68
Top1	Ratio of loan to top 1 single customer (%)	13.5	49.9	1.35	966.5
Top10	Ratio of loan to top 10 customers (%)	62.96	112.6	7.46	1804
Liquidity	Liquidity ratio (%)	51.5	15.4	23.5	142.5
Loan_deposit	Loan divided by deposit (%)	63.2	9.6	27.1	99.7
NPL	Bad loan or NPL ratio (%)	1.69	2.12	0	21.76
Capital_adeq	Capital adequacy ratio (%)	13.19	5.33	2.30	74.95
Top1_shareholder	Share of the top1 shareholder (%)	20.98	15.56	4.23	92.0
Inflation	National rate of inflation (%)	3.26	2.16	-1.40	5.90

Source: calculated by the author based on dataset of this paper. Net profit per person is in unit of RMB10,000, and value of total asset is in unit of RMB 1 billion.

Besides state share and size, we control for the following variables that may affect bank profitability, i.e., ratio of loans to top 1 single client, ratio of loans to top 10 clients, liquidity ratio, loan to deposit ratio, non-performing loan ratio, and capital adequacy ratio. We also control for a macroeconomic indicator, national inflation rate, inflation varies across years but is constant for all panels in any given year. We control for inflation because government monetary policy will affect both inflation and bank profitability, so we use inflation rate as a proxy for government monetary policy and also for macroeconomic cycles. Macroeconomic theory suggests that reserve-deposit ratio will affect bank profitability, we do not control for this variable since we have controlled for loan-deposit ratio. GDP growth is sometimes included as a proxy for the macroeconomic environment in which banks operate<sup>[9]</sup>, but we believe that the growth of assets of banks largely originates from economic growth. Since we have included asset size in the regression, we can omit economic growth rate. The names, definitions and summary statistics of the variables are presented in TABLE 1.

## MODELS AND METHODOLOGY

Considering the data set, we will use panel data models. The advantages of using panel data are obvious. First, panel data can provide us with more observations. Second, panel data can effectively control for the heterogeneity of individual banks, since the banks have quite different backgrounds and characteristics. Third, from the point view of econometric method, panel data can provide more information, more variation, and more degrees of freedom, and less collinearity.

Given the panel data, we still have three options when choosing an appropriate model to use. That is, we could choose among pooled OLS model, fixed effect (FE) model, and random effect (RE) model. When choosing between pooled OLS and FE, we use Wald test. The Wald test shows that FE is more appropriate. When choosing between pooled OLS and RE, we use B-P test and LR test, both tests show that RE model is more appropriate. When choosing between FE and RE, we use Hausman test. The Hausman test supports the FE model. The model is specified as follows:

$$\begin{aligned} \text{profitability}_{it} = & \beta_0 + \beta_1 \text{state}_{it} + \beta_2 \text{size}_{it} + \beta_3 \text{top1}_{it} \\ & + \beta_4 \text{top10}_{it} + \beta_5 \text{liquidity}_{it} + \beta_6 \text{loan\_deposit}_{it} + \beta_7 \text{NPL}_{it} \\ & + \beta_8 \text{capital\_adeq}_{it} + \beta_9 \text{top1\_shareholder}_{it} + \beta_{10} \text{inflation}_t + u_{it} \end{aligned} \quad (1)$$

Here, *profitability* is measured by the three different measures explained above (so we have three specific models, each model with a different dependent variable measuring profitability); the meanings of all the variables are listed in TABLE 5. The inclusion of a large set of control variables is to minimize the omitted variable bias, thus to reduce the problem of endogeneity.

## REGRESSION AND EXPLANATION

Considering the data set, we will use panel data models. The advantages of using panel

Regarding the effect of bank size on profitability, all three models indicate that size has a significant positive effect on profitability, both economically and statistically. That is to say, data strongly suggest that Chinese banking industry enjoys apparent economics of scale. The regression results show that, on average, when total assets increase by 1 percent, net profit per person will increase by 0.53 percent, ROA and ROE will increase by 0.2 and 1.7 percentage points (TABLE 2). These are economically significant effects since the mean ROA is less than 1 percent, while the mean of ROE is about 18 percent (TABLE 1).

The significant effect of bank size on profitability is relatively easy to understand. Given the mismatch between the monopolistic banking sector and competitive industrial sector, it is not difficult for a bank to find a customer to whom to grant loans, while it is difficult for a borrower to get loans from a bank if it has no collaterals such as land or real estate. Some previous studies have confirmed the economies of scale effect in banking industry<sup>[12]</sup>, who found that a handful of large banks tend to emerge over time in European banking markets. This may be because of government encouragement or the workings of the market mechanism.

The finding explains why almost all Chinese commercial banks are trying to grow larger, especially those relatively smaller banks. Smaller banks face more intense competition, and that is why new employees of these banks are strongly encouraged or even pushed to attract deposits. Given the monopoly position of the entire banking industry (private investors are not allowed to open banks), existing banks have no difficulty in finding customers to grant loans provided they have enough capital (deposits). So not only small and medium-sized banks want to grow larger, but large banks want to become even larger.

The finding also explains why most Chinese banks are unwilling to serve farmers since the average loan size in the rural area is much smaller. For instance, Agricultural Bank of China (ABC) had been specified to finance agriculture and farmers since its establishment in 1979. Its operations had been mainly in the countryside. But once ABC was expected to become a profit-oriented commercial bank, it has gradually retreated from the rural area and moved to cities<sup>[8]</sup>.

Accompanying this process, many rural credit cooperatives and later township and village banks have been established to make up the gap.

**TABLE 2: Regression results, 123 banks, 1999-2012**

Variables	Model [1]	Model [2]	Model [3]
Independent Variables	Dependent Variable: Log (Net Profit Per Person)	Dependent Variable: ROA	Dependent Variable: ROE
State	-0.013*** (0.008)	-0.0037* (0.0022)	-0.034 (0.045)
Size	0.527*** (0.046)	0.208*** (0.031)	1.698*** (0.631)
Top1	-0.0005 (0.0015)	-0.0004 (0.0011)	-0.031 (0.022)
Top10	-0.0035*** (0.0007)	-0.0003 (0.0005)	0.0020 (0.011)
Liquidity	-0.0018 (0.0023)	-0.0018 (0.0015)	0.055* (0.030)
Loan_deposit	0.0002 (0.004)	-0.0029 (0.0027)	-0.011 (0.056)
Capital_adeq	0.0123 (0.0083)	0.0164*** (0.0053)	-0.161 (0.109)
NPL	-0.025* (0.0152)	-0.018* (0.011)	-0.580*** (0.2156)
Top1_shareholder	0.0192*** (0.0046)	0.0038 (0.0032)	0.0169 (0.066)
Inflation	0.0092 (0.0085)	0.019*** (0.0059)	0.457*** (0.120)
Constant	-2.654*** (0.7000)	-1.258*** (0.4733)	-0.825 (9.710)
Adj. R squared	0.8889	0.8002	0.6193
Observations	425	465	465
Model	Fixed Effect	Fixed Effect	Fixed Effect

Notes: (1) \*\*\*, \*\*, and \* besides the estimates stand for statistically significant at 10%, 5%, and 1%, respectively. Figures in the parentheses are standard errors of the estimated coefficients.

## CONCLUSION

This paper shows that size has a significant and positive effect on bank profitability, both economically and statistically. That is to say, there exists strong “economies of scale” in Chinese banking sector. This paper explains why most Chinese banks are trying to grow larger, and why no large banks are really willing to serve small the medium-sized enterprises (SMEs), nor are they really willing to serve the rural areas.

The findings of this paper reflect a fundamental problem in the economic structure of today’s China. Compared with the industrial and manufacturing sectors, the banking sector is still monopolized and highly controlled, in the sense that no private investors are allowed to open a bank. At the controlled interest rates, the demand for loan far exceeds the supply of it. Therefore, almost all banks, state-owned or non-state owned, make profits far more easily than the competitive manufacturing industries. Furthermore, the government controls interest rates and many indicators of risk like reserve-deposit ratio, but it does not control a bank’s size, so almost all banks make efforts to grow larger to reap the benefits of economies of scale.

## REFERENCES

- [1] A.Park, K.Seprt; Tests of financial intermediation and banking reform in China, *Journal of Comparative Economics*, **29**, 608-644 (2001).
- [2] V.Shih, Q.Zhang, M.Liu; Comparing the performance of Chinese banks: a principal component approach, *China Economic Review*, **18**, 15-34 (2007).
- [3] P.Molyneux, J.Thornton; Determinants of European bank profitability: a note, *Journal of Banking and Finance*, **16**, 1173-1178 (1992).

- [4] J.Bikker, H.Hu; Cyclical patterns in profits, provisioning and lending of banks and pro-cyclicality of the new Basel capital requirements, *BNL Quarterly Review*, **221**, 143-175 (2002).
- [5] J.Goddard, P.Molyneux, J.Wilson; Dynamic of growth and profitability in banking. *Journal of Money, Credit and Banking*, **36**, 1069-1090 (2004).
- [6] J.Boyd, D.Runkle; Size and performance of banking firms: testing the predictions of the theory, *Journal of Monetary Economics*, **31**, 47-67 (1993).
- [7] S.Zhao, L.Xiang; Advantages and performance of American community banks, *Economic Perspective*, **6**, 129-134, (2010).
- [8] S.Zhao; The transformation of China's Financial Market: The Government, the Firm and the Financial Institutions, *Macau University of Science and Technology* (2011).
- [9] C.Jiang, S.Yao, Z.Zhang; The effects of governance changes on bank efficiency in China: A stochastic distance function approach, *China Economic Review*, **20**, 717-731 (2009).
- [10] K.Matthews, N.Zhang; Banking profitability in China 1997-2007: measurement and convergence, *China Economic Review*, **21**, 617-628 (2010).
- [11] M.Ariff, L.Can; Cost and profit efficiency of Chinese banks: a non-parametric analysis, *China Economic Review*, **19**, 260-273, (2008).
- [12] P.Molyneux, W.Forbes; Market structure and performance in European banking, *Applied Economics*, **27**, 155-159 (1995).