Empirical Analysis of Ownership-Performance Nexus in Chinese Banks

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Abstract. To explore the relationship between ownership structure and bank performance, the authors run regressions based on panel data and analyze the results by cross section weight method. The corporation attribute of banks makes corporate governance a vital link in this nexus. Results of empirical research suggest that ownership structure decides the nature and extent of this nexus. Reasonable and varied ownership structure in commercial banks contributes to acquire high level corporate governance and better bank performance.

Introduction

China’s high-level economic growth partly depends on the excess of funds available for investments. Higher saving rates and trade surpluses currently generate excess funding which is put in foreign securities and foreign direct investment (Berger, Hasan and Zhou, 2009). Plenty of funds could be put in Chinese market and high performance fund allocation seems not as significant in those developing countries that in low water.

Banks have corporation attribute and without doubt that they have some particularities both in themselves and in their corporate governance. The ways in which banks’ ownership structure influences their corporate governance and then governance influences bank performance are of great value to investigate. It is worth notable that, existing literature maybe miss some points which are valuable to study. Firstly, a few works explain this nexus by taking into account the role of corporate governance, as it is a pivotal link in this nexus. Secondly, detailed and feasible measurements for policy-making are not presented unambiguously given the actual financial situations in China. The main aim of this paper is trying to fill these gaps.

Literature Review

The Development View and the Political View arise towards the economic effects of government’s shareholding in banks. The former holds that the government should play positive part in banking industry. Government’s shareholding is advantageous to financial and economic development, especially to productive efficiency improvement (Qian, 2012). But the latter view gains widely support including Kornai (1979) and Shleifer & Vishny (1994). It argues that the aim of government’s shareholding in banks is to support employment, subsidy and other benefits. Some politicians control the credit allocation of banks based on political goals other than society demand. This undoubtedly hinders the improvement of financial system.

Early relevant researches are mostly normative statements which emphasis on allowing diversification in the ownership structure of banks to improve their efficiency (Liu and Huang, 2002). Measuring and comparing different types of banks’ efficiency is the main field of early studies. As a result of the difference of methods and samples adopted, research results are correspondingly divergent. Qin and Ouyang (2001) adopt DEA method measuring Chinese commercial banks’ efficiency. They find that these banks are generally in low efficiency, especially the largest four state-owned banks. ‘DEA uses linear programming method to construct a piecewise linear surface or frontier over the investigate data. DEA searches for points with the lowest unit
output, and connect those points to form the efficiency frontier. Any company not on the frontier is considered inefficient’ (Lee and Chih, 2013).

Fu and Heffernan (2007) research on 14 Chinese banks’ cost efficiency in 1985--2002 and find that joint-stock banks averagely share high efficiency than state-owned banks. Moreover, they take a step further and results show that the effects of bank sector’s reform turn the key point of their another research (Fu and Heffernan, 2009). Berger, Hasan and Zhou (2009) analyze ownership-efficiency data in 1994--2003. They find the largest four state-owned banks in China have lower efficiency. But foreign banks are more efficient. Therefore, minority foreign ownership has truly improved China’s bank efficiency.

Issues of banks’ corporate governance become a new perspective to study economic effects of ownership on bank performance. He et al (2017) investigate the corporate governance and performance of 166 small and medium-sized commercial banks in China, and they find that there is diversity in the influence that corporate governance mechanism put on small and medium-sized commercial banks. This influence is based on the balance between the earnings and cost and is restricted by the characteristics of banks.

All in all, most studies hold that banks’ state-owned attribute leads to their absence of independence and policy-making mechanism, though minority of literature argue that this attribute has no effect on bank’s performance. Banks not only are put under central government’s overmuch intervene, but also undertake government’s policy-making task. Lower efficiency and worse performance of these banks are result of this development mode.

Methodology

Variables, Sample and Data Selection

Annual reports of 11 Chinese listed commercial banks from 2010 to 2016 are main data source of this analysis. Banks that chose as samples include Shanghai Pudong Development Bank, Hua Xia Co., Ltd, China Minsheng Banking Corp., Ltd, China Merchants Bank, Bank of Nanjing, Industrial Bank Co., Ltd, Bank of Communications, Industrial and Commercial Bank of China and China CITIC Bank. Selected according to ownership attribute, these banks are state-controlled or state-participated banks, domestic private banks and foreign-controlled banks. Respectively, eight indicators are gathered from every bank from 2010 to 2016 and they are return on equity (RoE), shareholding ratio of first majority shareholder (A1), Herfindahl index (H5), ratio of state owned shares(GSH), ratio of tradable shares (LSH), company size, capital asset and actual controller type.

Model Establishment

Panel data is adopted to run the regression of the ownership structure-performance nexus. Panel data is defined as a combination of time-series and cross-sectional data. Among which, time-series data is a sequence of data points, measured typically at successive points in time spaced at uniform time intervals. Cross-section data is a data set collected by observing many subjects (such as individuals, firms or countries / regions) at the same point of time.

As follows, a regression model is constructed:

\[ \text{RoE} = a_0 + a_1 X + a_2 LN + a_3 L + a_4 UC + \varepsilon. \]  

where \( X \) denotes ownership structure indicators \( A1, H5, GSH \) and \( LSH \) respectively in four sub-models. These four indicators are tested separately given the multicollinearity among them. In other words, testing the correlations between every indicator of ownership structure and bank performance. And four sub-models are as below:

\[ \text{RoE} = a_0 + a_1 A1 + a_2 LN + a_3 L + a_4 UC + \varepsilon \]  

\[ \text{RoE} = a_0 + a_1 H5 + a_2 LN + a_3 L + a_4 UC + \varepsilon \]
\[ \text{RoE} = a_0 + a_1 \text{GSH} + a_2 \text{LN} + a_3 \text{L} + a_4 \text{UC} + \varepsilon \] (4)

\[ \text{RoE} = a_0 + a_1 \text{LSH} + a_2 \text{LN} + a_3 \text{L} + a_4 \text{UC} + \varepsilon \] (5)

**Results**

**Descriptive Statistical Analysis**

As Table 1 shows, RoE individual difference is small as from its Std. Dev, which indicates the slightly difference between performance within sample banks. From the mean value of RoE, sample banks’ good performance is easy to conclude. Similarly, LSH dispersion level suggests its low individual difference but LSH mean value announce a higher extent of opening up. In addition, about half of sample banks have achieved full circulation of ownership until 2016. Some matters of ownership structure have been improved, such as too low proportion of tradable shares and excessive concentrated non-circulating shares.

<table>
<thead>
<tr>
<th>Table 1. Descriptive Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean</strong></td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>0.2032</td>
</tr>
<tr>
<td>0.2008</td>
</tr>
<tr>
<td>0.02750</td>
</tr>
<tr>
<td>0.15</td>
</tr>
<tr>
<td>0.27</td>
</tr>
</tbody>
</table>

The values of other three indicators (A1, H5 and GSH) of ownership structure indicate huge divergence among sample banks. For instance, with regard to A1, its Maximum is up to 67%, while the Minimum is only 13%. Its Mean is 0.2777 which signifies that shareholding of the first major shareholder accounts for almost 30% in total amount of shares. It suggests that the ownership concentration of sample Chinese banks is relatively higher. Internal governance of listed banks may be kept under the supervision of majority shareholders. In addition, values of H5 are high in 11 listed banks and it affects internal governance to some extent.

Given Std. Dev of GSH and LSH in Table 1, former individual difference is big but the latter is small. Mean of LSH is more than 0.9 which shows a well-developed LSH. But GSH is in different place as its Mean is small.

Except Bank of Minsheng, it is worth to note that the proportions of state-owned shares have exceeded 10% in every sample bank, and Mean is 37.93% and Maximum is 71%. Evidently, stated-owned shares’ high proportion signifies banks’ internal governance is put under the influence of external environment. It is one of the characteristics of ownership structure in China’s commercial banks.

**Regression Analysis**

There are four steps to establish a regression model based on panel data.

Firstly, to carry on stationarity analysis, adopting Eviews 5.0, carrying on Unit Root Test to pool series one by one under the pool object. The results suggest that pool series pass the unit root test and therefore, sample data pass the stationarity test.

Secondly, to choose the model type, via F-statistic as below, examining whether to select fixed effect regression model or mixed effect regression model.

Null Hypothesis \( H_0: a_1 = a_0 \), Intercept of every bank in the model is the same (The actual model is mixed effect regression model).

Alternative Hypothesis \( H_1: \) Intercept \( a_i \) of every bank in the model is different (The actual model is fixed effect regression model).

\( F \)-statistic is defined as:

\[
F = \frac{(SSE_a - SSE_e) / [(NT - k - 1) - (NT - N - k)]}{SSE_e / (NT - N - k)} = \frac{(SSE_e - SSE_a) / (N - 1)}{SSE_e / (NT - N - k)}. \] (6)
where $SSE_r$ denotes restricted model, that is residual sum of squares of mixed effect regression model; $SSE_u$ denotes non-restricted model, that is residual sum of squares of bank fixed effect regression model. $NT$ denotes total panel observations; $N$ denotes the number of cross-section used, non-restricted model has $N-J$ more estimated parameters than restricted model.

Then, numerical value of $F$ statistics can be computed based on its formula above.

$$SSE_r = 0.024253, SSE_u = 0.009690, F = 6.462425.$$ In addition, the critical value of standard $F$ distribution is $F_{0.05}(10,43) = 2.059313$.

As $F = 6.462425 > F_{0.05}(10,43) = 2.059313$, Null Hypothesis is rejected. Therefore, fixed effect regression model by bank is selected finally. It is the same as other three models (Eq. 2, Eq. 3 and Eq.4).

Thirdly, to confirm estimation method, cross-section weights method is adopted with the aim to overcome the likely heteroscedasticity among different sections. This method does initial regressive estimation of coefficients applying same weight, and then running weight least squares using estimating weights. The weighting method is linear estimation after one-step weighting matrix.

Fourthly, constructing individual fixed effect regression model. Take the example of Eq.1, the corresponding fixed effect model is as follows:

$$RoE_u = -1.2537 + 0.0297D_1 - 0.0179D_2 + 0.0411D_3 + 0.0524D_4 + 0.0038D_5 + 0.0472D_6$$
$$- 0.0003D_7 - 0.0055D_8 + 0.0235D_9 - 0.0482D_{10} - 0.1257D_{11} - 0.0256A1_u$$
$$- 0.0121LN(assets)_u + 1.4779L_N - 0.0031UC_u$$

where $RoE_u$ is the dependent variable, $A1_u$ is independent variable, $D_j (j=1,2,...,11)$ is dummy variable, and it has the meaning of:

$$D_i = \begin{cases} 1, & \text{if it belongs to } i^{th} \text{bank}, \quad i = 1,2,\ldots,11 \\ 0, & \text{others} \end{cases}$$

Regression analysis result of above models is shown in Table 2.

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A1$</td>
<td>-0.0256</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.1465)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$H5$</td>
<td></td>
<td>-0.0437*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0577)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$GSH$</td>
<td></td>
<td></td>
<td>-0.0497**</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.0092)</td>
<td></td>
</tr>
<tr>
<td>$LSH$</td>
<td></td>
<td></td>
<td></td>
<td>0.0862**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.0158)</td>
</tr>
<tr>
<td>$LN(assets)$</td>
<td>0.014917**</td>
<td>0.0165**</td>
<td>0.0161**</td>
<td>0.0122**</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>$L$</td>
<td>1.2306**</td>
<td>1.0784**</td>
<td>0.2180**</td>
<td>1.8192**</td>
</tr>
<tr>
<td></td>
<td>(0.0004)</td>
<td>(0.0023)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>$UC$</td>
<td>-0.0056</td>
<td>-0.0033</td>
<td>-0.0006</td>
<td>-0.004</td>
</tr>
<tr>
<td></td>
<td>(0.4359)</td>
<td>(0.6474)</td>
<td>(0.9242)</td>
<td>(0.5704)</td>
</tr>
<tr>
<td>$Adj \ R^2$</td>
<td>0.9692</td>
<td>0.9640</td>
<td>0.977</td>
<td>0.9867</td>
</tr>
<tr>
<td>$Adj \ R^2$</td>
<td>0.3836</td>
<td>0.3873</td>
<td>0.2936</td>
<td>0.4233</td>
</tr>
</tbody>
</table>

(Weighted)

Note: Figures in brackets are $p$-value of corresponding coefficient. * and ** are significant at 10% and 5% levels respectively.

In order to overcome small sample limitation, and meanwhile increase accuracy of panel model, cross section weighting method is applied in all the models, that is, doing initial regressive estimation of coefficients using the same weight, then running weight least squares applying estimating weights.
Discussion

Ownership Concentration and Bank Performance

Values of $A1$ and $H5$ convey ownership structure information from Table 2. As Model 1 $p$-value=0.1465 > 0.1 and $a_1$ = -0.0256 < 0, it can not conclude a significant negative correlation between shareholding ratio of first major shareholder and bank performance. This regressive insignificance may result from China’s immature market economy since laws and regulations are to be improved. Besides, it is distinct of sample banks’ characteristics including internal governance and it results in implicit variable divergence within sample data. Big noise comes from these foundations and influences the regressive coefficients estimation accuracy.

To be different in Model 2, as $p$-value = 0.0577 < 0.1 and $a_2$ = -0.0437 < 0, it can conclude a significant negative correlation. The higher Herfindahl index value, the poorer bank performance.

Ownership Composition and Bank Performance

From Model 3, $p$-value = 0.0092 < 0.05 and $a_3$ = -0.0497 < 0, a significant negative correlation between $GSH$ and bank performance can be concluded. To some degree, government’s intervene goes ill with bank governance. But from Model 4, $a_4$ = 0.0862 > 0, $p$-value = 0.0158 < 0.05, bank performance is significantly and positively under the effect of the ratio of circulating shares. Thus, along with increasing the ratio of circulating shares and improving bank performance, the undergoing non-tradable share reform is achievable. It aims to dispose of the contradiction between tradable and non-tradable shares to enable the latter to go public in stock exchange.

Conclusions

Empirical analysis results indicate that ownership structure diversification of banks does enhance their performance in the light of the negative correlation between shareholding ratio of top five shareholders and bank performance. State-owned shares’ nominal position could be concluded from significant negative nexus between state-owned shares ratio and bank performance. Nevertheless, given the positive nexus between tradable share ratio and bank performance, it can be seen that stronger mechanism for market supply and demand of share price comes from higher tradable share ratio. Share price fluctuation is the signal of opinions that the market including shareholders towards banks. Board of directors and senior managers could be motivated by this and exert themselves to improve banks’ corporate governance and eventually enhance bank performance.

Ownership-performance nexus analysis is restricted by the following aspects. In the first place, this research only explores linear correlation within the nexus while non-linear correlation is not considered. It results in inaccuracy of analysis results. In the second place, dependent variable selection needs to be mended. Indicator RoE is popular to measure banks’ profitability but it can not represent banks’ cost of capital. More suitable indicators can be adopted to reflect bank performance including net return on equity. Finally, analysis results are come from a sample of eleven listed commercial banks which can not take on all Chinese listed commercial banks. Furthermore, evolution of the nexus can not be comprehensively showed from a seven-year time span (2010-2016). Analysis results will be more distinct with a bigger sample size and longer time span.

Deeper analysis could be done from the ways to improve banks’ corporate governance as it is an intermediary to promote bank performance. Decreasing state-owned shareholding ratio properly and introducing foreign investors could achieve these goals given the negative correlation between over-higher state ownership and bank performance. However, it has not yet researched the deep foundation behind this phenomenon. For better development of Chinese commercial banks in financial market, as Shen and Wang (2005) deeply mine the dynamics of interactions between money market and capital market via the integration of support vector machines (SVM) into copula functions. The complexity of financial system and the multi-approach function mechanism between the two markets is the key issue that SVM could solve. Financial administration could be achieved via studying the interaction between these two markets.
Acknowledgments

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References


