# The impact of government ownership on performance: Evidence from major Chinese banks

by

**Bo(Bob) Xu**

**Haiyi(Amanda) Hu**

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**Name: Bo Xu and Haiyi Hu**

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**Supervisory Committee:**

_____

**Dr. Christina Atanasova**

Senior Supervisor

Associate Professor of Finance

_____

**Dr. Evan Gatev**

Second Reader

Associate Professor of Finance

**Date Approved:** _____

## Abstract

Chinese banking system plays increasingly more important role in the word financial system and has attracted a lot of attention during recent years. The purpose of this paper is to study and analyze the relationship between government ownership and major Chinese banks' performance. Our paper studies the sample data collected during the period between 2000 and 2011, and regression analysis is conducted for the purpose of examining how the government ownership change would impact the bank performance. As indicated by previous literature about bank performance, bank performance is often affected by bank size, capital ratio and net interest margin (NIM). Our results show that decreased government ownership can improve major Chinese banks' performance.

**Key words**: Government ownership, bank performance, major Chinese banks

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# 1. Introduction

As China's economy continues to expand and its market continues to grow, the country is playing increasingly important role in the world economy. Chinese banking sector plays an important role in the country's financial system, and the country's banking system is huge in size and is under continuous transformation. One of the remarkable changes under transformation is the ownership change in major Chinese banks, as the percentage of government ownership in those banks has gone down and outside investors including foreign investors are allowed to invest in many major Chinese banks. In our paper, we conduct empirical analysis using regressions of bank performance measures on bank ownership changes, to investigate the relationship between government ownership change and bank performance.

In the past many studies have examined banking and performance related topics on banks in Europe and North America, but there have been few such studies on Chinese banks' performance. As Chinese banking system becomes more important on the international stage, many researchers have started to study China's banking system. We review related studies about Chinese bank performance and show that most of these studies did not study the connection between government ownership and Chinese bank performance. Although there are several papers that have studied how the government ownership would impact performance of major Chinese banks, they use data mainly from the period before the year of 2005. As we know major Chinese state-owned banks began to initiate public offering since 2005 while majority of joint-stock banks and city level banks were under reorganization after 2005 as well, the result is both ownership and performance have changed dramatically for these banks, so it is worth to have detailed study about bank performance during longer time periods. Our study intends to fill the time gap and make the study as representative as possible.

We use similar methodology as used by Berger et al. (2005) and selected similar variables to analyze data collected for major Chinese banks from 2000 to 2011. Our study focuses on the question: does decrease of government ownership of major Chinese banks make these banks have better performance? We classify major Chinese banks into five categories, state-owned banks, joint-stock banks, city banks, policy banks and foreign banks. Regression analysis is conducted for each type of banks for related performance measures, and then regression results are evaluated to find relationship between dependent variables (performance variables) and independent variables. Performance variables consist of impaired loans/gross loans (NPLs), ROA, and ROE three variables, which are three measurements generally used to evaluate bank performance.

Our empirical results suggest that major banks in China, especially big five state-owned banks tend to perform better when the government ownership on these banks decreases and when foreign or private ownership for these banks is introduced, although the degree of correlation between government ownership change and bank performance varies among different types of banks. Our data also shows that in general bank size and net interest margin are positively correlated with major Chinese banks' performance. Overall our research findings are consistent with results from majority of related literature about the relationship between government ownership and banks.

The organization of this paper is presented as follows. Section 2 gives the general background of Chinese banking system reform since 1970s. Section 3 is related literature review about bank performance. Section 4 describes the data and model we used to analyze the relationship between ownership change and performance of major Chinese banks. Section 5 shows the empirical results about our study, and in section 6 we draw the conclusion of the paper.

## 2. Review of Chinese banking system reform

China started to reform its banking system in the late 1970s. The main goal of the reform is to establish a competitive and efficient banking system. As the banking system was largely owned by the government and was separated from the world's economic system, it took many steps for the reform to form a competitive banking system that contains various categories of institutions.

China's banking system used to be a Soviet-style mono-bank model before 1978. People's Bank of China (PBC) worked as the central bank and all other banks in the country were under the same administrative hierarchy. After 1978, the Communist Party of China decided to gradually reform Chinese financial system and establish a "socialist market economy". As banking system plays a crucial role in a country's financial system, the reform in banking system became the most important and urgent demand for China.

### 2.1 Banking system reform prior to 1992

Chinese banking system reform can be divided into three stages. The first stage is from 1978 and continued to 1992. During this period, four state-owned banks were separated from the People's Bank of China. There was no competition among the four state-owned banks since each of the four banks had its own area to serve. These four state-owned banks are the Agricultural Bank of China (ABC), the Bank of China (BOC), the People's Construction Bank of China (PCBC), and the Industrial and Commercial Bank of China (ICBC). These four state-owned banks undertook the commercial bank business of the PBC. In particular, the ABC took the role in agricultural financing, the BOC took part in foreign trade, the PCBC took over the mission in construction, and the ICBC played role in financing business activities of state-owned business.

In this way, the PBC worked as a central bank and carried out monetary and financial policy, and the mono-banking system has changed into a banking system consists of one central bank and four state-owned banks.

2.2 Banking system reform from 1993 to 1997

The second stage of reform in Chinese banking system began in 1993 and continued till 1997. This stage of reform was focused on deregulation and aimed to create a more competitive banking system. With the issue of the *Resolution on Financial System Reform* in 1993, Chinese banking system added three policy banks. They are China Development Bank, the Export and Import Bank of China, and the Agricultural Development Bank of China. The functions of the three policy banks are to promote the development of infrastructure, to stimulate country's export and to ensure food productions. The Central Bank Law and Commercial Bank Law were issued in 1995, standing to promote a more sound payment and settlement system that can be established all over the country. The Big Fours were allowed to expand their business scope and to compete with each other. During this period a number of new bank types emerged, including city-level commercial banks, domestic joint-equity banks, Chinese-foreign joint-equity banks, privately owned banks and foreign banks. The state-owned banks are still the largest banks in China. Although city-level commercial banks and joint-equity banks are smaller individually compared to the Big Fours, they have grown fast and have a larger number of branches in the countryside and rural area. Among the city banks, the first city-level commercial bank, Shenzhen City Commercial Bank, was established in 1995. There were more than one hundred city commercial banks since 2005, and the camp of city-level commercial banks is still growing nowadays. China Minsheng Bank was founded in 1996 and is the first and only privately-owned bank in China. Foreign banks have been allowed to enter Chinese bank market since 1979. From

1979 to 1995, foreign banks could only be engaged in foreign business. After 1995, foreign banks were allowed to take part in commercial business under foreign currency. However before 2001 there were strict rules that limited the entry of foreign banks. For instance only two cities，Shanghai and Shenzhen, were open to foreign banks.

2.3 Banking system reform after 1997

The third stage of banking system reform was brought by the Asian financial crisis of 1997. During this period, the importance of a stable financial system stood out. The financial crisis brought more freedom to the state-owned banks as they could decide the object of lending. However this freedom seemed to bring large non-performing loans to the Big Fours. Berger et al. (2009) state that the Big Fours have accumulated a large amount of NPLs during these years. Meanwhile the Chinese government helped to reduce NPLs in the balance sheets of the state-owned banks. In 1998, Chinese government injected RMB 27 billion into the Big Fours to strengthen the banking system. China continued its reform in banking system in order to be prepared for the intensified competition after fully open the banking sector by the end of 2006.

When China joined the WTO in 2001, most of its financial sector was opened up. After China entered WTO, the restrictions on entrance of foreign bank have been removed. From 2006 there were no location restrictions for foreign banks. The number of foreign banks has grown rapidly by 2011 and there are nearly a hundred foreign banks in the Chinese banking system. The Hong Kong and Shanghai Banking Corporation, the Citibank National Association, and the Standard Chartered Bank are among the top ten biggest foreign banks in China. As a result, foreign experience and international standards were introduced into the Chinese banking system, which enhanced the efficiency of domestic banks.

As a consequence of years of reform, China's banking system changed greatly and became a more stable system. Major Chinese commercial banks enhanced their ability of attracting capital and allocating asset during the past decade. The Big Fours has grown to be top thirty banks in the world. Among them the Agricultural Bank of China is listed in the eighth of the world's top one thousand banks and ranked A1 by Moody's. All of the Big Fours were listed on the Shanghai stock exchanges after 2010 and since then foreigners can buy limited number of shares of these banks.

2.4 The continuity of banking system reform

By the year of 2009, Chinese banking reform achieved milestone progress. The mono-bank system translated into a complicated system which consists of the central bank (PBC), China Banking Regulatory Commission (CBRC), China Banking Association (CBA), three policy banks (CDB, TEIBC and ADBC), five partially privatized SOCBs (ICBC, ABC, BOC, CCB and BOCOM), 12 Joint-Stock Commercial Banks (JSCBs), more than 100 City-Commercial Banks (CCBs), and a large amount of other small financial institutions. However this does not mean the Chinese banking system has become an absolutely stable system. There are still many problems to be solved during the restructuring process. For example, the bad debt level for state-owned banks is still relatively high, and better manage skills are still needed to improve banks' operating efficiency.

## 3. Literature Review

There exist many studies on the performance of banks in different countries. The factors that affect the bank performance are different, and many studies suggest that these differences depend on the locations where different banks operate; for example, the factors that affect bank performance in transition economies would be different from the factors that affect bank performance in developed economies. Through the study of existing literature, we notice that the factors that affect the bank performance generally include organizational structure, institution size, capital, national economy, and management expertise, etc.

In the finance and economics literature, ownership structure is often considered as an important factor that can affect a financial institution's performance. Ownership structure for financial institutions is often divided into state ownership and private ownership. Shleifer (1998) argues that private ownership is often more preferable to public ownership because organizations under private ownership have motivations to earn profit, and this can make organizational operation more efficient. However, private ownership may not always be the best choice and may cause problems in some situations. Bonin et al (2004) used data from banks in transition countries to analyze the impact of ownership on banking performance. They got the conclusion that privatization is not directly related to better performance. One study on Mainland China's privatization experience finds that government ownership has a positive impact on partially privatized state-owned enterprises (Qian Sun et al., 2002). On the other hand, Verbrugge et al., (2000) find that bank privatization improved the performance of banks in OECD countries by increasing these banks' profitability. So far, majority academic studies find that state-controlled enterprises do not necessarily deliver expected benefits to the general public. Dewenter and Malatesta (1997) find that the activities of state controlled companies are often connected with

political objectives of government officials. The practice of state ownership for banks and enterprises is common in transition economies and many big financial institutions are controlled by governments. Cecchtti and Krause (2001) find that state-owned banks can make a country's monetary policy ineffective. These studies conclude that state ownership sometimes causes organizations to ignore social objectives and to implement inefficient operations.

There are some recent papers examined the impact of government ownership on the banking industry. Banking systems in most countries consist of state-owned banks and privately-owned banks (POBs). In fact, state-owned banks often control the majority of total assets in the national banking system. Micco et al. (2007) find that GOBs in developing countries are less efficient than POBs in those countries. Some researchers find that politics has significant impact on the banking industry, for example, Brown and Dinc (2005) suggest financial institutions that are in economic trouble are more likely to be taken over by the governments before elections. Two perspectives are often used to discuss the role of government in a country's banking system: the social perspective and political perspective. Historically many state-controlled banks were set up for the purpose of investing in areas that private banks were unwilling support, particularly areas that are critical for a country's development. According to social perspective, government-owned banks (GOBs) can help to stabilize market and improve social benefits. In addition, social perspective concludes that a nation's banking system with larger weights of GOBs should have higher economic growth rate. Political perspective focuses on political rather than social objectives, and it argues that GOBs are used by politicians to provide economic advantage to their supporters. After financial crisis, governments spent huge amount of money on bailouts of failed banks in Europe, and this has caused public outcry. As Shleifer and Vishny (1997) indicate, GOBs are controlled by the political party that is in power, and politicians often have political

agenda that is in conflict with public interests, and this can threaten country's social interests in some cases.

Many studies have researched the impact of state control on banks. These studies can generally be divided into following two categories:

(i) Macroeconomic analysis, most of which research the impact of state ownership on financial development, stability of economy, and other macroeconomic factors

(ii) Microeconomic analysis, most of which research the performance of GOBs and privately-owned banks (POBs). Some studies research why certain activities are conducted by the GOBs

By using data of Chinese banks from 1997 to 2004, Lin and Zhang (2009) find that the four state-owned commercial banks are less profitable, less efficient and tend to have lower asset qualities compare to other types of banks in China except policy banks. Barth et al. (2001) suggest countries that have higher degree of government involvement in the banking sector, tend to have less developed banking systems and worse economic performance. GOBs may have political or social goals to achieve, and these goals may not put organizational performance or efficiency as priority. However, Altunbus et al. (2001) do not find sufficient evidence to indicate that privately-owned banks are more efficient than government-owned banks, although POBs may have some performance advantages that GOBs do not have. Interestingly, Adrianova et al. (2010) also find that countries with higher proportion of state-owned banks have higher economic growth rate than countries with lower proportion of state-owned banks, and this finding suggests that national banks can contribute to a country's economic development. Overall, either government-owned banks or privately-owned banks can have certain advantages over the other. Lower profitability and efficiency for GOBs may be related to the fact that GOBs

finance projects with high social returns that POBs are not willing to finance, and in this way state-owned banks may contribute some benefits that POBs cannot contribute.

Most banks in China are controlled by the state, which means majority banks in the country are either controlled by the central government or controlled by governments at the local level. The existence of foreign banks in a country's financial system has certain impact on a country's banking industry. Some recent studies have examined banks' performance in transition economies by using financial measures. According to IMF (2000), foreign banks' return on equity (ROE) is significantly higher than domestic banks' ROE in Hungary, Poland, and the Czech Republic from 1996 to 1998.When foreign banks enter a country's market, the competition is intensified and country's banking system becomes more diversified. Claessens and Huizinga (2001) suggest that foreign bank entry can improve a country's banking system because intensified competition can improve banks' operating efficiency. Some researchers find that the entry of foreign banks has both positive and negative impacts on the domestic banking system. It seems that the effects of foreign bank entry, whether they are good or bad, will depend on a country's specific situation, for example, depending on the country's level of economic development and general business environment.

The measurement of commercial banking profit is usually divided into internal and external parts. The internal measurements are usually generated from banks' financial statements while external measurements are related to operational and outside business environment, which influence the managerial and administrative environment of financial industry. Size, capital and costs management are often considered as internal measurements by many studies. Akhavein et al. (1997) suggest that size is a main variable which is positively correlated with banking profitability because relatively large banks can raise capital at lower costs. The amount of loan

can also contribute to banking profits. Some scholars believe that there is a positive relationship between loan ratio and profitability. Bank profitability is usually measured by Return on Asset (ROA), Return on Equity (ROE), and in some situations, the net interest margin. Other macroeconomic factors such as regulatory changes can also be used to measure bank performance.

## 4. Data, Methodology, and Variable

### 4.1 Data

In our analysis, we use Bankscope database and Chinese Almanac of Finance to collect an unbalanced panel data. We retrieve the ROA, ROE, NPLs (Impaired loans/Gross loans), NIM (Net Interest Margin), bank size, and capital ratio for major banks in China through 2000 to 2011. The total amount of observations collected from the database is 12,856. As table 1 shows, our sample contains data for the Big Fives with 59 observations, three policy banks with 36 observations, 11 Joint-Stock Commercial Banks with 109 observations, 13 city-level commercial banks with 134 observations, and 8 foreign banks with 40 observations. Our sample totally yields 378 observations. Some of our observations are not used in the regressions because some banks lack data for some years during their historical period.

Table 1 Distribution of observations (number of banks for each available type)

| Year | State-owned | Policy | Joint-Equity | City-Commercial | Foreign | Total |
|---|---|---|---|---|---|---|
| 2000 | 4 | 3 | 7 | 5 | 0 | 19 |
| 2001 | 5 | 3 | 7 | 7 | 0 | 22 |
| 2002 | 5 | 3 | 7 | 10 | 0 | 25 |
| 2003 | 5 | 3 | 7 | 12 | 0 | 27 |
| 2004 | 5 | 3 | 9 | 12 | 0 | 29 |
| 2005 | 5 | 3 | 8 | 13 | 2 | 31 |
| 2006 | 5 | 3 | 11 | 13 | 2 | 31 |
| 2007 | 5 | 3 | 11 | 13 | 6 | 38 |
| 2008 | 5 | 3 | 10 | 13 | 7 | 38 |
| 2009 | 5 | 3 | 10 | 13 | 7 | 37 |
| 2010 | 5 | 3 | 11 | 12 | 8 | 39 |
| 2011 | 5 | 3 | 11 | 12 | 8 | 39 |
| Total | 59 | 36 | 109 | 134 | 40 | 375 |

The Big Fives contains five state-owned commercial banks, namely Industrial & Commercial Bank of China (ICBC), China Construction Bank, Bank of China (CBB), Agricultural Bank of China (ABC), and Bank of Communications (BC). They are five biggest banks in China. Among which, Industrial & Commercial Bank of China is the biggest bank in China. Until the end of 2011, with the asset accounts to 15.476868 trillion, ICBC became the third largest bank in the world in terms of total assets.

The three policy banks were established in 1994. During the second period of Chinese banking reform, the Agricultural Development Bank of China, China Development Bank, and

the Export-Import Bank of China were established in order to undertake the duties of government spending functions. They are now still completely owned by the government of China.

Joint-Stock Commercial Banks are smaller than the Big Five state-owned banks and three policy banks in terms of total assets, nevertheless have many branches in vast developed area in eastern part of China. We choose 11 Joint-Stock Commercial Banks, namely Hua Xia Bank, the Ping An Bank, China Minsheng Bank, China Guangfa Bank, Shanghai Pudong Development Bank, China Everbright Bank, China Zheshang Bank, China Merchants Bank, China Bohai Bank, Baoshang Bank and Evergrowing Bank in our analysis because these banks have large amount of assets and they are highly representative of situations of Chinese Joint-Stock Commercial Banks and can provide a broad view of Chinese banking system at the local city level.

We also collected data on city-level commercial banks as they cover most second-tier and third-tier cities in China. These banks are partially owned by governments at the local level and other private investors. We selected 13 Joint-Stock Commercial Banks in our investigation. They are the Bank of Qingdao, the Bank of Tianjin, the Harbin Bank, the Bank of Changsha, the Bank of Shanghai, the bank of Hangzhou, the Bank of Nanchang, the Bank of Jiangsu, the Bank of Shaoxing, the Bank of Dalian, the Bank of Nanjing, the Bank of Wenzhou, and the Bank of Beijing. Some of these banks were established in recent years and do not have available data prior to 2005. These city-level banks are highly representative because they mainly operated in major Chinese cities that play important roles in the Chinese economy.

Along with these banks, we also chose data from several foreign banks as they have become a growing competing power in the Chinese banking system. We chose the Citibank, Bank of Montreal, Bank of East Asia, Deutsche Bank, HSBC Bank, JP Morgan Chase Bank, Royal Bank of Scotland, and United Overseas Bank as our sample for foreign banks.

4.2 Methodology and Variables

We follow methodology put forward by Berger et al. (2005). We estimate the following regression model:

**Bank Performance variables = Constant +$\beta_1$ Static Ownership Indicators + $\beta_2$* Dynamic Ownership Indicators + $\alpha$* Control Variables + Error Term (1)**

The Variables are defined in Table 2 in appendix. We separate the variables in our model into three categories: Performance variables (dependent variables), control variables (independent variables), and ownership structure variables ((explanatory variables). The main hypothesis is that the effect of government ownership on performance is negative.

4.2.1 Performance Measures (Dependent Variables)

In our analysis, we use three measurements to evaluate bank performance; they are Return on Asset (ROA), Return on Equity (ROE), and Impaired Loans to Gross Loans Ratio. Return on Asset is calculated as net income divided by average total assets. The ROA ratio is generally used to evaluate a company's ability to generate profits from its available total assets, and it is often used to compare performance of organizations in the similar industry. In most cases, higher ROA ratio indicates that a bank has better performance. Return on Equity is calculated as net income divided by total average equity. The ROE ratio is used to measure how efficiently a bank can generate profits from its shareholder's equity. ROE is best used to compare

companies or organizations in the same or similar industry. Impaired Loans to Gross Loans Ratio is calculated as impaired loans divided by gross loans, and it is used to measure a bank's asset quality. The higher Impaired Loans to Gross Loans Ratio, the worse a bank's asset quality is, and bad asset quality often has negative impact on bank performance.

### 4.2.2 Independent Variables (Control Variables)

Bank size, capital ratio, and net interest margin are included as independent variables in our analysis. These three independent variables are used as specific factors to measure bank's profitability, and each of the three independent variables has its own characteristics that could affect bank's profitability measurement.

#### Bank Size

Bank size is determined by bank's logarithm of total assets. In general, banks that have bigger size (with more assets) tend to have larger business scopes and therefore have more business competitive advantages than smaller banks. On the other hand, due to large amount of business operations brought by big banks' larger business scopes, they are more vulnerable to systematic market risk; therefore, big banks' performance are often subject to the performance of a country's economy. According to Shleifer (1998) bank size is positively correlated to the bank performance to certain degree, and when bank size passes certain level its impact on bank performance will not be as significant as before.

#### Capital Ratio

Capital ratio is calculated as equity divided by total assets, and it is used to evaluate the performance plays an important role to evaluate bank performance. It is a ratio that measures

bank's ability to meet liability and other risks such as credit risk. Capital ratio is usually expressed as a percentage when used for financial analysis. Many countries' banking regulators pay close attention to capital ratios in order to protect depositors, and this can help to maintain confidence in the banking system.

Net Interest Margin (NIM)

Net Interest Margin is calculated as net interest income divided by average earnings assets, and it is usually expressed as a percentage. The higher net interest margin means that a bank has greater ability to generate profits. Net Interest Margin is a profitability measure and can be used to evaluate a bank's investing and lending activities. Generally speaking, others things being equal, the higher NIM means that greater ability that a bank has to earn profits. Net Interest Margin is widely used by analysts across the globe to conduct financial analysis, especially for the evaluation of bank profitability, as mentioned by Brown and Dinc (2005).

4.2.3 Ownership structure variables (Ownership indicators)

Static ownership indicators (variables)

Static ownership indicators are variables that identify the banks that did not experience change in their ownership structure during the investigating period. Static ownership indicators are identified for each type of banks, and if there is no change for the ownership of a bank, the data for related information will not be selected.

Dynamic ownership indicators (variables)

Dynamic ownership indicators are variables that identify the banks that have ownership changes after the year of 2005, which is the year that major state-owned banks started public

offering. The impact of such ownership change can last up to 3 years. The dynamic ownership is applied to measure how the performance of major state-owned banks changes after 2005. For those major state-owned banks, the performance after 2005 is compared with the performance before 2005 in order to evaluate performance.

## 5. Empirical Results

Table 3 & 4 show the summary statistics of the performance and control related variables. For each performance variable and control variable, mean, standard deviation, maximum value and minimum value are illustrated for each type of banks. Related values are calculated based on available data from 2000 to 2011 for each type of banks. City level banks have the highest average ROA of 0.8334 and the maximum value of ROA for this type of bank is 1.73, which is quite high compare with other Chinese banks, while foreign banks have the second highest average ROA of 0.7447 with maximum value of 1.74. Our results show that foreign banks have highest standard deviation of 0.4493, which may suggest that foreign banks in China perform quite differently. Policy banks have the lowest average ROA of 0.4269, part of the reason may be that policy banks are totally controlled by the Chinese central government and are not profit driven, so policy banks do not have incentive to conduct commercial businesses but instead they focus on major projects or policy operations that are encouraged by the Chinese government.

In terms of ROE, our data shows that city level banks also have the highest average of 16.3713, while foreign banks have the lowest average ROE with value of 7.6775. Foreign banks' low ROE maybe related to low market penetration rate; that is, compare with local Chinese banks, foreign banks have fewer local business branches, and this may limit foreign banks'

performance to certain degree. The big five state-owned banks have average ROE with value of 12.28, which is quite similar as joint-stock banks. However, state-owned banks' ROE value also has quite high standard deviation, which suggests that these banks' performance has relatively higher fluctuation and is subject to change of government policies. Even though state-owned banks have been operating as commercial banks for years, they are still affected by government policy significantly. Policy banks have average ROE with value of 9.6997, which is the second lowest among all the five bank types. Even though policy banks have been granted a lot of resources by the Chinese government, they still have relatively lower ROA and ROE ratios. This is consistent with theoretical argument that government ownership has negative impact on bank performance in developing countries.

In terms of impaired loans/gross loans ratio, big five state-owned banks have the highest ratio with value of 8.6505, and this suggests that these banks have highest level of bad debt, which often causes operational problems for banks over the long term. Foreign banks have lowest level of impaired loans/gross loans ratio with value of 0.6903 and lowest level of standard deviation of 1.1279. This suggests that foreign banks in China manage their bad debt quite effectively. Policy banks have the second highest level of average impaired loans/gross loans ratio with value of 3.518, and this means that policy banks also have relatively high level of bad debt. It is not surprising to see that banks with high level of government ownership in China tend to have high level of bad debt, and this is because Chinese government often provides help to these banks when their bad debt surpasses certain level, and the result is that these banks have less incentive to manage their debts because they know that help will be granted from the government when they run into trouble. Since impaired loans/gross loans ratio is one important factor to evaluate bank performance, our result is consistent with past literature Micco et al.

(2007) which suggest that government owned banks in developing countries often have inefficient business operations.

Table 3 Summary Statistics of Performance Variables (measured in percentage %)

| Performance Variables | Mean | Standard Deviation | Max | Min |
|---|---|---|---|---|
| ROA | | | | |
| State-owned | 0.7447 | 0.4473 | 1.47 | 0.01 |
| Joint-stock | 0.5891 | 0.4377 | 1.45 | -1.39 |
| City | 0.8334 | 0.4085 | 1.73 | -0.48 |
| Policy | 0.4269 | 0.4635 | 1.31 | 0.01 |
| Foreign | 0.7773 | 0.4493 | 1.74 | -0.06 |
| ROE | | | | |
| State-owned | 12.28 | 15.7409 | 83.46 | -27.93 |
| Joint-stock | 12.7236 | 23.1267 | 42.16 | -193.9 |
| City | 16.3713 | 7.6440 | 37.72 | -14.06 |
| Policy | 9.6997 | 8.6231 | 28.37 | 0.14 |
| Foreign | 7.6775 | 5.4737 | 21.91 | -0.31 |
| Impaired loans/Gross loans (NPLs) | | | | |
| State-owned | 8.6505 | 10.1582 | 34.17 | 0.08 |
| Joint-stock | 3.1017 | 5.1913 | 28.43 | 0.1 |
| City | 2.8525 | 4.1974 | 24.64 | 0.6 |
| Policy | 3.518 | 8.0140 | 45.08 | 0.4 |
| Foreign | 0.6903 | 1.1279 | 4.1 | 0.05 |

Table 4 Summary statistics of control variables

| Control Variables | Mean | Standard Deviation | Max | Min |
|---|---|---|---|---|
| Net interest margin (NIM) (in percentage %) | | | | |
| State-owned | 2.31 | 0.72 | 3.25 | 1.39 |
| Joint-stock | 2.2377 | 0.8191 | 3.52 | 1.07 |
| City | 2.3756 | 1.0306 | 4.73 | 1.1 |
| Policy | 1.4426 | 0.9662 | 3.08 | -0.12 |
| Foreign | 1.5373 | 1.0487 | 3.84 | 0.79 |
| Asset Log | | | | |
| State-owned | 6.63 | 0.3232 | 7.19 | 5.80 |
| Joint-stock | 5.4442 | 0.5520 | 6.4274 | 4.0131 |
| City | 4.7981 | 0.4828 | 5.9805 | 3.8882 |
| Policy | 5.9263 | 0.4922 | 5.4298 | 3.5631 |
| Foreign | 4.5427 | 0.5472 | 5.4298 | 3.5631 |
| Capital ratio | | | | |
| State-owned | 0.04 | 0.0429 | 0.09 | -0.14 |
| Joint-stock | 0.0454 | 0.0340 | 0.3135 | -0.0132 |
| City | 0.0531 | 0.0208 | 0.1307 | 0.0171 |
| Policy | 0.0435 | 0.0284 | 0.1207 | 0.0118 |
| Foreign | 0.1302 | 0.0656 | 0.3227 | 0.0474 |

Note: Actual asset numbers are shown in additional table of appendix

Table 5 reports the regression results when using ROA, ROA and Impaired loans/Gross loans (NPLs) as dependent variables. We conduct regression test for each type of banks on ROA, ROE and NPLs. The number of total observations is 381, including 59 observations for the Big

Five state-owned banks, 113 observations for joint-stock banks, 134 observations for city-level commercial banks, 35 observations for policy banks, and 40 observations for foreign banks.

Our regression results show that for big five state-owned banks, the impact of change in government ownership is positively correlated with bank performance; that is, the change of government ownership has improved state-owned banks' performance to certain degree. The positive correlation exists for both ROA and ROE measurements, and it also shows that after 2005 (the year when major state-owned banks started to go public) performance for major state-owned banks has improved. This is consistent with the conclusion drawn by Boubakri et al. (2004) that privatization can improve the performance of a bank to some extent. The performance improvement is statistically significant for ROA measurement since t-stats is 3.4856 (significantly above 1.96) and p-value is 0.00094 (significantly lower than 0.01); that is, both values are statistically significant. However, for ROE and NPLs measurements, although the change of government ownership does have impact on bank performance, the statistic value is not as significant as ROA measurement. This may be attributed to the fact that state-owned banks in China rely heavily on fixed assets to generate income, so the value of ROA measure is more obvious and significant.

Regarding the joint-stock banks, regression results show that the decreasing in government involvement and slight increase in non-government ownership (such as private ownership and foreign ownership) can improve banks performance slightly. After such ownership change, joint-stock banks' bad debt level (NPLs) has decreased while both ROA and ROE have increased, and this suggests that these banks' performance has improved. Lower NPLs generally means that there is improvement in a bank's asset management, which is one of the important factors for evaluating bank performance. On the other hand, it should be noted that

regression values does not show that the impact of such ownership change is significantly correlated with improvement of bank performance, and this means that other factors might also have contributed to the improvement of bank performance.

Regarding the city level banks, our regression results show that there is positive correlation between ownership change and bank performance. In terms of ROA performance measurement, the positive correlation exists for both periods that before 2005 and after 2005, and this suggests that for city level banks, the increase of private ownership and foreign ownership might contribute to the higher ROA ratio. However, regression results do not indicate that the correlation is statistically significant since neither t-stats nor p-value has met the significance criteria. This means that other factors may also contribute to the performance improvement for city level banks during the research period.

The three policy banks have experienced no change in ownership during the selected period since they are completely owned by the Chinese government. Comparing to the other four categories of banks in our analysis, we found that three policy banks may be the least profitable banks in China. This may result from the fact that policy banks in China are created to take over the state spending functions of the country. They are response for financing economic and trade development and state-invested projects. The inherent functions of these policy banks have determined that they have to put the benefits of the country in front of their own profits. These banks may have to invest in projects that are significant for country's economic development over the long term but provide fewer profits over the short term. Bonin et al. (2005) get the similar result that government-owned banks tend to collect fewer deposits and have higher costs when providing services that have social benefits.

Foreign banks in China do not have ownership from Chinese government, so the ownership impact is minimal; however, these banks are subject to local regulations and banking laws. After China jointed WTO and opened its banking market, the entrance of foreign banks has intensified competition among banks, and this helps to improve the overall banking system in China. Although most foreign banks in China do not have long operating history, these foreign banks have brought mature banking management skills and experience to the country.

Table 5 Performance and ownership change (regression results)

| | ROA | ROE | Impaired loans/Gross loans (NPLs) |
|---|---|---|---|
| Static indicators | | | |
| State-owned | -0.1172 | 0.2930 | 3.2142 |
| (p-value) | (0.3525) | (0.9644) | (0.3417) |
| Joint-stock | 0.0068 | 0.2874 | 1.230 |
| (p-value) | (0.9597) | (0.9709) | (0.4792) |
| City | 0.0525 | 3.1354 | 1.1869 |
| (p-value) | (0.7885) | (0.4920) | (0.6909) |
| Policy | 0.0183 | -2.7290 | 1.3747 |
| (p-value) | (0.9358) | (0.6699) | (0.8357) |
| Foreign | 0.0155 | 1.0452 | -0.1277 |
| (p-value) | (0.3024) | (0.6007) | (0.7890) |
| Dynamic indicators | | | |
| State-owned | 0.5434 | 5.5393 | -6.2764 |
| (p-value) | (0.0010)*** | (0.4997) | (0.1392) |
| Joint-stock | -0.0131 | 7.7718 | -2.2668 |
| (p-value) | (0.9231) | (0.3316) | (0.2001) |
| City | 0.8520 | -2.1175 | -2.1651 |

| | | | |
|---|---|---|---|
| (p-value) | 0.0322** | (0.5991) | (0.4119) |
| Policy | 0.0111 | 3.7909 | -3.2411 |
| (p-value) | (0.9502) | (0.4493) | (0.5322) |
| Foreign | -0.2899 | -1.4801 | 0.2288 |
| (p-value) | (0.3024) | (0.5838) | (0.7230) |
| Number of observations | 381 | 381 | 381 |

Note: Significance level *10%; **5%，***1%

Table 5 reports the regression results for performance and control variables. For each control variable, bank size, net interest margin, and capital ratio, five bank types are also identified respectively. Regarding the bank size, our results show that for state-owned banks, the impact of bank size on ROA and NPLs is positive. For joint-stock banks and policy banks, we also see positive correlation between bank size and ROA. For city level banks, the regression results show that the impact of bank size is positive on ROA, ROE and NPLs all three performance variables. This suggests that large banks can gain business advantage because it has more business assets that can be put into business operations. This result is consistent with Hauner (2005), which suggests that large banks can benefit from economic scales through the allocation of fixed assets.

Regarding net interest margin, our regression results show that for state-owned banks, the net interest margin is positively correlated with ROA and ROE, and the t-stats for ROA measurement is significant, which means that net interest margin has positive impact on bank performance. Generally speaking, higher net interest margin means that banks have higher ability to earn profitability. We also noticed that for net interest margin is negatively correlated with ROA and ROE for policy banks, although the values are not statistically significant, the results

do have consistency with the fact that policy banks in China are not profit driven and do not take deposits from the general public. For foreign banks, net interest margin is positively correlated with ROA, ROE and NPLs, and this result shows that net interest margin is an important measure for evaluate foreign banks' profitability. This result is consistent with the fact that foreign banks are more mature and have superior management skills.

Table 5 Performance and control variables (regression results)

| | ROA | ROE | Impaired loans/Gross loans (NPLs) |
|---|---|---|---|
| Control variables | | | |
| Net interest margin | | | |
| State-owned | 0.1993 | 2.4637 | -5.6486 |
| Joint-stock | 0.1831 | 4.5285 | 0.2007 |
| City | 0.1695 | 3.5867 | -0.6543 |
| Policy | -0.02322 | -2.0167 | 0.9631 |
| Foreign | 0.1433 | 1.0510 | 0.1268 |
| Bank size (asset log) | | | |
| State-owned | 0.1488 | -7.4183 | 0.1851 |
| Joint-stock | 0.1463 | -3.6150 | -0.5329 |
| City | 0.2159 | 4.3117 | 0.0024 |
| Policy | 0.4297 | 12.5102 | -1.1735 |
| Foreign | -0.0361 | 1.8884 | -1.2303 |
| Capital ratio | | | |
| State-owned | 0.7813 | 122.9629 | -91.1445 |
| Joint-stock | -1.4796 | 32.3976 | -38.2331 |
| City | 5.9622 | -141.805 | -6.5440 |

| | | | |
|---|---|---|---|
| Policy | 9.5644 | -44.8658 | -48.3988 |
| Foreign | -0.4651 | -40.5152 | -3.4223 |

Regarding capital ratio, we find that for all types of banks, capital ratio is negatively correlated with NPLs. This result is not surprising since higher capital ratio generally means better banking performance, while higher NPLs generally mean worse banking performance. Foreign banks in China have higher average capital ratio than local Chinese banks, and higher capital level generally implies that less fund can be lent out or be used for investment. Higher capital ratio for foreign banks may be attributed to the fact that foreign banks in China need to hold more capital to safeguard daily business operations, while local Chinese banks have more resources to gain capital and can get more assistance from the governments at the central level and local level.

The regression results for the overall bank data from 2000 to 2011 shows that foreign banks tend to have lower bad debt level and generally better performance in terms of ROA. This result may due to the fact that foreign banks generally have more mature banking experience and better management skills, and this also explains why performance for Chinese state-owned banks has improved after some foreign ownership has been introduced.

## 6. Conclusion

Chinese banking system has experienced dramatic transformation during the past two decades. In this paper we analyze the impact of government ownership on bank performance by using unbalanced panel data for major Chinese banks from 2000 to 2011. Regression and related analysis are conducted for all five types of banks, and performance measures (dependent variables) for all the banks are evaluated based on Impaired loans/Gross loans (NPLs), ROA and ROE three factors. Independent variables consist of bank size, capital ratio and net interest margin three measurements. Static indicators and dynamic indicators are used to evaluate related ownership change and are included in the regression analysis. To compare bank performances before and after the reform in ownership structure, we use dynamic indicators to analyze performance changes before and after mergers and acquisitions and we use static indicators to compare the differences between banks that undergo change in ownership structure and banks that did not have changes in ownership structure during the selected period.

Our empirical results show that after decrease in government ownership for major Chinese banks, especially big five state-owned banks and city level banks, related banking performance has improved. After 2005 state-owned banks started to go public, that is, these banks open doors for investment from outside investors (government still owns majority of state-owned banks) and small percentage of foreign ownership is allowed. Our data show that virtually all the state-owned banks have seen significant improvement in ROA and ROE ratios after they went public, and regression results show that there is positive correlation between government ownership change and performance of state-owned banks. Although some of the performance measures are not statistically significant, the general trend for performance improvement is quite clear. The

results are consistent with Claessens and Huizinga (2001) that foreign bank entry can improve banks' operating efficiency and performance.

Regarding joint-stock and city level banks, although the performance of these banks has also improved after government ownership change, our data does not show that the correlation between ownership change and performance improvement is statistically significant. This could suggest that other factors such as improved management skills and application of more advanced technology may contribute to the improved banking performance; however, these factors are beyond the scope of this research paper.

The three policy banks have poorer performance than their counterparts since they have the lowest average ROA and second lowest average ROE. Past literature about Chinese banks suggests that policy banks in China may be more efficient and have less non-performing loans than other commercial banks because these policy banks can get capital injection by the government and have access to policy support. It is interesting to find that policy banks have second highest NPLs in our data (the banks with highest NPLs are state-owned banks). We think this may result from the fact that in China banks with large amount of government ownership tend to care less about non-performing loans because these banks expect the government to take care of bad assets and bad loans. Another reason could be due to the fact that policy banks have different goals and they focus more on risky projects that are risky but with important for country's economic development.

Overall, our findings suggest that major banks in China tend to perform better when the government ownership on these banks decreases and when foreign ownership for these banks is introduced. This is consistent with results from many related literature about the relationship

between government ownership and banks. However, there are still some insufficiencies that should be noticed; for example, determinants of banking performance may be different in normal periods and financial crisis (2008-2009), and our data covers these time periods. In the future, it might be a good idea for related research studies to evaluate the impact of financial crisis on Chinese bank performance.

# APPENDIX

Table 2 (Definition for related variables)

| (Variables) Symbol | Definition |
|---|---|
| Dependent Variables | |
| Performance measures | Return on Asset = Net income/Average total assets |
| | Return on Equity = Net income/Average total equity |
| | Impaired loans to gross loans ratio= Impaired loans/Gross loans |
| | (This ratio is used to measure asset quality) |
| Independent Variables | |
| Bank Size (Asset) | Logarithm of total asset is used to measure bank size. |
| Asset_State | Logarithm of total assets for state-owned banks |
| Asset_Policy | Logarithm of total assets for policy banks |
| Asset_Joint Equity | Logarithm of total assets for joint equity banks |
| Asset_City | Logarithm of total assets for city commercial banks |
| Asset_Foreign | Logarithm of total assets for foreign banks |
| Capital Ratio | Capital Ratio = Equity/Total Assets |
| Capital Ratio_State | Capital Ratio for state-owned banks |
| Capital Ratio_Policy | Capital Ratio for policy banks |
| Capital Ratio_Joint Equity | Capital Ratio for joint equity banks |
| Capital Ratio_City | Capital Ratio for city commercial banks |
| Capital Ratio_Foreign | Capital Ratio for foreign banks |
| Net Interest Margin | NIM = Net interest income/Average earning assets |
| NIM_State | NIM for state-owned banks |
| NIM_Policy | NIM for policy banks |
| NIM_Joint Equity | NIM for joint equity banks |
| NIM_City | NIM for city banks |

| | |
|---|---|
| NIM_Foreign | NIM for foreign banks |
| Ownership structure variables | |
| Static (variables) indicators | |
| Static_State | Static variables for state banks |
| Static_Policy | Static variables for policy banks |
| Static_Joint Equity | Static variables for joint equity banks |
| Static_City | Static variables for city banks |
| Static_Foreign | Static variables for foreign banks |
| Dynamic (variables) indicators | |
| Dynamic_State | Dynamic variables for state banks |
| Dynamic_Policy | Dynamic variables for policy banks |
| Dynamic_Joint Equity | Dynamic variables for joint equity banks |
| Dynamic_City | Dynamic variables for city banks |
| Dynamic_Foreign | Dynamic variables for foreign banks |
| Additional dummies used for regression | |
| Dummy_Policy | |
| Dummy_Joint Equity | |
| Dummy_City | |
| Dummy_Foreign | |

Additional Table (Bank actual assets measured in billions of U.S.)

| Bank Type | Mean | Max | Min |
|---|---|---|---|
| Actual Asset | | | |
| State-owned | 903.8740 | 2,579.478 | 104.697 |
| Joint-Stock | 89.6618 | 445.952 | 1.7178 |
| City | 19.8107 | 159.332 | 1.2885 |
| Policy | 237.4254 | 1,041.918 | 11.3768 |
| Foreign | 11.1776 | 44.8358 | 0.6095 |

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