

**Comparative Analysis of Performance of All Commercial
Banks with Different Structures**

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Comparative Analysis of Performance of All Commercial Banks with Different Structures

Abstract

As the core of the tertiary industry, finance is the focus of modern economic development. Any slight change in the financial industry will have a decisive impact on the development of the world economy and the national economy of all countries. In today's world economic development situation, a country's financial development degree shows the economic development strength of the whole country. The promotion of economic status must rely on a strong financial market as the backing. Countries that do not have advantages in financial competition cannot become powerful countries in the world economy.

Due to historical and institutional reasons, the banking industry has always occupied a dominant position in China's financial system. Competition in the modern world market is getting more and more fierce. Commercial banks' foothold in the world market competition is the basis for ensuring the stable operation of China's banking industry, financial industry and even the whole country's economy. Therefore, improving the performance of commercial banks is an important way to improve China's international position in the world financial market and promote the sustainable development of domestic financial industry.

Guided by the theories of political economics, industrial economics, finance, econometrics and management, and drawing lessons from relevant theories, this paper adopts the methods of literature research, case analysis, combination of normative analysis and empirical analysis, combination of comparative research and comprehensive analysis, and combination of qualitative research and quantitative research.

By study the basic theory and literature review, This dissertation defines the concept and characteristics of core competitiveness in general sense, and analyzes and explains the concepts and theoretical research of competitiveness, core competitiveness, competitive advantage, etc. Then the dissertation expounds the reform and development process of China's commercial banks. Through the four stages of completion, tortuous development, dividend release and transformation development under the new normal, it sorts out the development sequence of

China's commercial banks, and points out the difficulties and problems existing in the reform at all stages of development.

Furthermore, This dissertation analyzes the index change trend of the sample banks from 2007 to 2018 by constructing the corresponding evaluation system, selecting the appropriate samples, sorting out and analyzing the corresponding panel data through the indicators of equity structure, scale strength, profitability, security capability, capital flow capability, etc. According to these data, the dissertation makes an empirical analysis on the performance evaluation of the sample commercial banks by constructing the performance index system and using the data envelopment analysis method, and analyzes the causes of the performance differences through the analysis results. In order to further explore the reasons for the performance differences between state-owned commercial banks and non-state-owned commercial banks, the dissertation explains the results of the data envelopment analysis method, using the regression analysis method to construct five models to analyze the impact of ownership concentration and the state-owned and non-state-owned shareholders on operating performance.

Key words: Commercial banks, Operating performance, Data Envelopment Analysis, Regression analysis.

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1. Introduction

1.1 Background and Significance of Research

1.1.1 Background of Research

(i) World Background

As for the origin of banks, we have heard different versions, which can be summarized into two versions: the goldsmith version and the foreign exchange dealer version. The goldsmith's version believed that the bank started with the saving function. Because goldsmiths store gold in the process of making gold products, they have better security measures. Some people who have gold deposit it in goldsmiths' shops for storage safety and pay a certain amount of storage fee at the same time. After a long time, the goldsmith found that some of the gold in his possession was a constant. Therefore, the goldsmith borrowed this "unused" gold to earn interest income. In this way, the early bank originated from the gold shop, and the early banker originated from the goldsmith. This hypothesis is very reasonable, but there has never been any historical research. ¹

Another argument of the foreign exchange dealer does not sound as reasonable as that of the goldsmith, but it is well documented. One was *Commercial Bank Management*² written by Peter S. Rose of the United

¹ Diao Li, Hu Juan. The Origin, Transactions and Contract Intensification of Banks [J]. Guizhou Social Sciences, 2018 (10): 118-124.

² Peter S. Rose. Commercial Bank Management Original Book 9th Edition China Edition [M]. Beijing: Machinery Industry Press. 2016.

States, and the other was Shanxi Exchange Shop from China. Peter S Rose believed that the word bank comes from the Italian Banco, which means bench, and was used by early bankers when trading in the market. The English word for "bank" means a cabinet for storing money. Early bankers were called "bench sitter". The emergence and development of banks are linked to the development of the currency commodity economy. The currency exchange industry in the former capitalist society was the basis for the formation of the banking industry. At first, the currency exchange industry only operated the coin exchange business. Later, it took care of the money, received and paid cash, and handled matters such as gold and silver allocation and settlement business. In this way, a large amount of money has gradually accumulated in the hands of exchange merchants. When money changers engaged in lending business, the money changers was developed into banks. The earliest bank in modern times was Venice Bank, which was founded in 1580 in Italy. The Shanxi Exchange Shop was the originator of China's banking industry and can also be said to be one of China's earliest representatives of bankers. According to historical records, the earliest Shanxi Exchange Shop appeared in the 7th year of Daoguang (1827 A. D.). Because of the independence of the provinces, the exchange way of Shanxi Exchange Shop was cut off and fell into crisis. The Exchange Shop Association went to Beijing to petition. At that time, when the Bank of Communications was established and developed, the petitioners were forced to stay by the government. This was also the earliest group of modern bankers in China. The exchange development was actually from the trade

development, and Shanxi is in the middle of the trade way between the south and the north.³

No matter what the origin of the bank is, few people can think that the bank will develop into such a huge, influential, exquisite and risky industry as it is today. We say banking or finance is an industry, so what is its industrial chain like? What is the position of commercial banks in this industrial chain? The best way to develop this industrial chain is to start with the banking business and the development of history.

Based on the bank's exchange function, then deposit, loan and exchange are the bank's basic business in any case.⁴ Of course, this is the basic business of commercial banks, but it is not the basic business of all banks. When we look at the banking business, there are three major areas: debt business, asset business and intermediary business. The reason why I put the liability business first and the asset business second is that for banks, without the source of funds, there is no use of funds. Of course, modern banks have begun to advocate a new business structure with intermediate business as the core, but we always believe that the traditional deposit and loan business is the basis for the development of banks, and any new business is an extension and innovation on this basis.

The main body of debt business is the deposit, including savings deposits,

³ Su Yanxia. Enlightenment of Internal Control System of Shanxi Exchange Shop to the Construction of Internal Control Mechanism of Commercial Banks in China [D]. Shanxi University of Finance and Economics, 2013.

⁴ Zhang Jie. Study on the Survival of Private Banks Dominated by the National Bank during the Republic of China—Taking the Development of Private Banks in Southwest China as Examples [D]. Southwestern University of Finance and Economics, 2017.

time deposits, certificates of deposit, call deposits, and deposits linked to the money market. The main body of asset business is the loan, including small loans, mortgage loans, medium and long-term loans, project financing, corporate restructuring loans, and syndicated loans; The scope of intermediary business is wider. It covers almost all non-asset and liability business, including not only existing international business, capital business, guarantee business, exchange and settlement business, but also many new business "packaged" on the basis of traditional business. Now we look back, it is on the basis of these traditional business of commercial banks that other financial institutions have been able to develop and gradually form a financial industry chain.⁵

For example, Savings bank was developed from deposits. Savings bank refers to a professional bank whose main business is to absorb personal savings deposits. It is called "mutual savings bank" in the United States and "trust savings bank" in Britain. Savings banks in capitalist countries absorb residents' deposits at low interest rates, which are used to purchase government bonds and shares and corporate bonds of capitalist enterprises, and transfer part of their funds to commercial banks to make profits.⁶ In China, no special savings bank has been set up, and the personal savings business is handled by specialized banks and credit institutions such as commercial banks. For example, the European housing savings banks require

⁵ Zhao Yarui, Jia Jin. Current Status and Future Development of Commercial Banks' Debt Business [J]. China Rural Finance, 2019.

⁶ Ling Gan. The Development Model of German Savings Bank and Its Enlightenment [J]. China Finance, 2016 (09): 78-80.

everyone who wants to buy a house to deposit a sum of money in the bank first and monthly. When you deposit a certain amount for a certain period of time, the banks will lend you the money you need to buy a house. The basic practice of the housing savings banks is also called "queuing principle".⁷ It embodies an old European "socialist ideology" to solve the housing loan problem through mutual aid and queuing. The main feature of the housing savings banks is savings. The loans here no longer have the original meaning, but they use their own money to buy houses. Therefore, some people have painted the color of "utopian socialism".

As far as loans are concerned, many banks have developed on the basis of small loans, with small customers as the main target of loans. For example, Austrian Volkswagen Bank and American Small and Medium Credit Association. There is also a very mature business, housing mortgage loan, or mortgage loan. On this basis, there are special mortgage banks. The staff of these banks are very professional in the real estate field, and many of the bank employees are real estate brokers. For example, in Hong Kong, China, there are some finance companies that specialize in mortgage. These companies do not pay too much attention to the income sources of the lenders, but rather to the properties and real estate of the lenders. Their funds mainly come from the income that the banks receive after the assets are packaged. Further development based on this kind of business is the current "asset securitization". The problem to be solved is the "light weight" of assets, that

⁷ Li Yuncai. Research on the Business Operation Model of Chinese and German Housing Savings Banks. [D]. Hunan University, 2010.

is, turning long-term assets into cash so as to improve the liquidity of assets.

Judging from the medium- and long-term loans and project financing of commercial banks, banks with medium-and long-term loans as the mainstay have emerged. The most typical one is the European Bank for Reconstruction, which was established for reconstruction after World War II. It mainly carries out the reconstruction of damaged infrastructure. Its funding source mainly relies on the issuance of medium-and long-term bonds.⁸ China Development Bank is a development financial institution at the national level. There is also a large financial institution, GE-CAPITAL of the United States, which has developed rapidly relying on medium-term and long-term loans. It is an enterprise finance company that mainly provides leasing, large-scale equipment loans and medium-term and long-term loans. Its bond issuance is registered with the highest credit and has made unique achievements in the financial market.

Besides, for corporate restructuring loans, bonds may be issued, including bridge loan and Syndicated Loan. On this basis, an investment bank has been developed. It is the development and specialization of corporate banking business of commercial banks. Even today, many investment banks still cannot operate without commercial banks. For example, in bridge loan, this is a business that often happens when an enterprise acquires a listed company in the capital market. In addition, financial consulting, advisory,

⁸Wei Tingting. The Construction of Economic Capital Management of Policy Banks——Taking KFW Banking Group and European Bank for Reconstruction and Development as Examples [J]. Chinese Banking Industry, 2017 (02): 79-82.

analysis and other business are also specifically divided on the basis of corporate banking business, granting credit to companies, so the banks understand the company's various situations. On this basis there will be derivative products, which are the embryonic form of consulting and consulting business, and also the main business of investment banks.

In addition, on the basis of international business of commercial banks, banks mainly engaged in international trade financing have emerged, typically the export-import banks. There are also banks whose main business is foreign exchange trading. There are also guarantee companies developed on the basis of bank guarantee business. In fact, a bank's guarantee business is linked to its liability and asset businesses. For example, the premise of a guarantee may be that you have a corresponding deposit in the bank, or it may be that a guarantee is a loan to be issued by the bank. There is also the bank's settlement business, which includes domestic and international. The four major settlement banks in the United Kingdom are developed on this function.

The central bank is no exception, and it is also developed from commercial banks. Banks with a large scale and a large network, such as Industrial and Commercial Bank of China, can become central banks through transformation and development, as is the case with the Bank of England. In 1833, Congress passed a bill stipulating that bank notes issued by the Bank of England were legal tender, thus the Bank of England became the central

bank.⁹ However, it is not so easy for commercial banks to become settlement centers. In Hong Kong, China, banknotes are issued by three note-issuing banks, namely HSBC, Standard Chartered Bank and Bank of China (Hong Kong). However, the settlement center is different, with HSBC in charge of sterling and Hong Kong dollars and Bank of China (Hong Kong) in charge of Renminbi. The central bank's interest rate policy and monetary policy are the derivatives of the currency issuance and settlement center. Therefore, the central bank is also developed from commercial banks, and for large commercial banks, it is only one step away from the central bank.

At the same time, policy banks are also necessary for the banking industry to carry out and cooperate with the government's social and economic policies or intentions, directly or indirectly engage in policy financing activities in specific business areas, and serve as tools for the government to develop the economy, promote social progress and carry out macro-economic management. At present, China has two policy banks: the Export-Import Bank of China and the Agricultural Development Bank of China. The National Development Bank is separated from the policy bank sequence and positioned as a development financial institution.

We have discussed the development and evolution of banking business from the perspective of financial industry chain. We can see from this process:

1. Commercial banks are the most primitive, traditional and basic form in

⁹ Zhang Jianhua. DEA Method for Efficiency Study of Commercial Banks in China and Empirical Analysis of Efficiency from 1997 to 2001 [J]. Financial Research, 2003 (03): 11-25.

the financial industry, the originator of the banking industry chain and the core of the financial industry chain.

2. All non-commercial banking institutions in the financial industry are extensions and specializations of one or several functions or businesses of commercial banks.

3. The business of commercial banks can theoretically cover the entire financial industry, but no other non-commercial banking institution can cover commercial banks. The reason is that commercial banks have a basic small weapon-checking account, which is the exclusive power of commercial banks.

(2) Background in China

Table 1-1 Changes in the Number of Financial Institutions in China

| Classification of ownership structure | Category of financial institutions | 2008 | 2018 |
|---------------------------------------|------------------------------------|------|------|
| State-owned capital holding | Policy bank | 3 | 3 |
| | Large state-owned commercial banks | 5 | 6 |
| Non-state-owned capital holding | Joint-stock commercial bank | 12 | 12 |
| | City commercial bank | 124 | 134 |
| | Housing savings bank | - | 1 |
| | Private bank | - | 17 |
| | Rural commercial bank | 8509 | 1427 |
| | Rural cooperative bank | | 30 |
| | Rural credit cooperatives | | 812 |
| | Village bank | - | 1616 |
| | Foreign corporation bank | 29 | 41 |

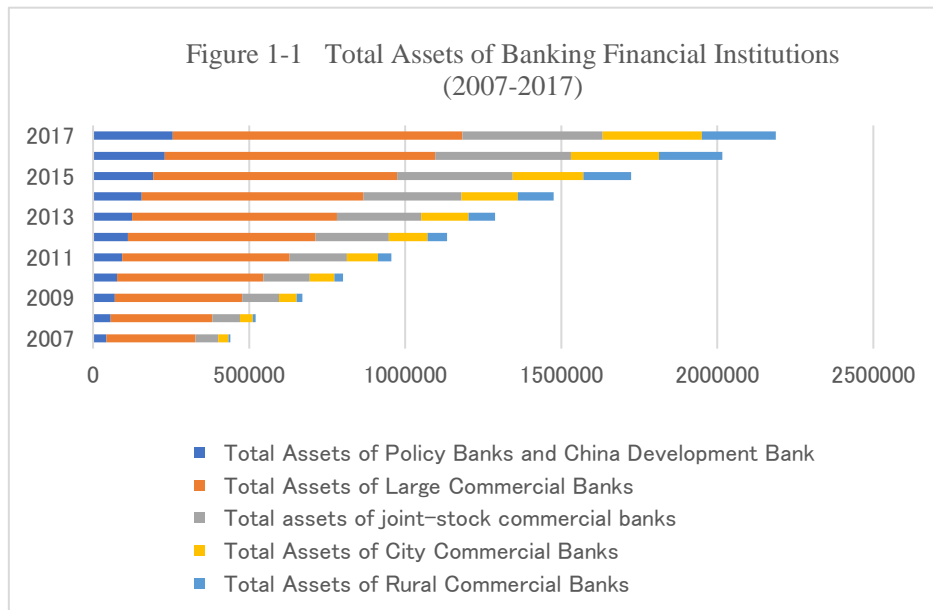
Sources: Almanac of China's Finance and Banking 2008- 2018

China's banking industry has been playing a leading role in China's financial market, playing an important role in credit intermediary and capital adjustment, and providing an important basic guarantee for China's economic development. According to the data of the China Banking and Insurance Regulatory Commission, as of the end of December 2018, China had a total of 4,588 banking financial institutions, including 6 large state-owned commercial banks, 12 joint-stock commercial banks, 134 city commercial banks, 1,427 rural commercial banks, 17 private banks, 812 rural

credit cooperatives and 1,616 village banks¹⁰. From the perspective of ownership structure, state-owned commercial banks account for a very large proportion compared with non-state-owned commercial banks. At present, the structure of China's commercial banks is constantly changing, the phenomenon of centralization no longer exists, and the competition among commercial banks will become more intense.¹¹ With the deepening of banking market reform, urban commercial banks and rural commercial banks have developed rapidly. At the same time, the establishment of private banks allowed by the Chinese government at the end of 2013 broke the inherent structure of the original banking industry, allowing the market to continue to disperse and stimulating the new vitality of the banking market. According to the total assets data of banking financial institutions, in the past ten years from 2007 to 2017, the largest increase in total assets was still in the large state-owned commercial banks, which had a huge scale and accounted for nearly half of the assets in the industry.

¹⁰ Data source: based on The List of Legal Persons of Banking Financial Institutions (up to the end of December 2018) compiled by the bank of China Banking and Insurance Regulatory Commission.

¹¹ He Ning, Xue Xiaofei. Analysis of the Development Status, Problems and Transformation Paths of Chinese Private Banks [J]. Economist, 2018 (07): 144-145 + 147.



Sources: China Economic Network Industry Statistics Database 2007-2017

Through the above, we can easily see that the number of financial institutions of state-owned commercial banks is small, but they still have a leading advantage in terms of asset size. Non-state-owned commercial banks have a leading advantage in the number of financial institutions. With the gradual improvement of China's financial market openness, there will be more and more opportunities for non-state-controlled commercial banks in the future. Whether the state-controlled commercial banks can continue to maintain their advantages, whether the non-state-controlled commercial banks can grasp the opportunities in the future, and how to develop in the increasingly competitive banking industry in the future have become the research directions of domestic and foreign scholars.

Due to the different political and economic systems in different countries, the role of commercial banks in the financial system is not the same. For example, at present, the capital market is very developed in the financial

system of the United States. In many countries on the continent of Europe, such as Germany and France, large banks dominate the financial system. To sum up, we have made the following assumptions for the research of this paper based on the previous research directions of scholars:

At present, under the socialist market economy system of China, the coexistence of state-owned commercial banks and non-state-owned commercial banks has become an established fact. Such coexistence will have a positive impact on China's market economy system, enhance the market's product supply capacity and improve the market liquidity.

1.1.2 Significance of Research

1.1.2.1 Academic Significance

The performance appraisal of commercial banks is a set of system arrangement that takes the overall goal of the bank as the guidance, comprehensively applies the performance appraisal method, evaluates the performance of all levels of institutions, departments and employees of the bank, and takes the performance as the basis for the value distribution of employees. Performance appraisal not only reflects the development concept and management ideas of commercial banks, but also has a significant impact on employees' management behavior because it directly affects their vital interests. It is the "baton" of bank management. Based on the macro evaluation of panel data and envelope data analysis, this paper expects to obtain the comparative advantages of each bank through regression analysis.

Finally, on the basis of two comparative analyses, the performance gap between commercial banks and non-state-owned commercial banks abroad is compared. Therefore, this paper expects to establish a perfect evaluation system to evaluate the performance difference between state-owned commercial banks and non-state-owned commercial banks on the basis of referring to previous evaluation indexes.

1.1.2.2 Practical Significance

As the core of the tertiary industry, finance is the focus of modern economic development. Any slight change in the financial industry will have a decisive impact on the development of the world economy and the national economy of all countries. In today's world economic development situation, a country's financial development degree shows the economic development strength of the whole country. The promotion of economic status must rely on a strong financial market as the backing. Countries that do not have advantages in financial competition cannot become powerful countries in the world economy.

Due to historical and institutional reasons, the banking industry has always occupied a dominant position in China's financial system. Competition in the modern world market is getting more and more fierce. Commercial banks' foothold in the world market competition is the basis for ensuring the stable operation of China's banking industry, financial industry and even the whole country's economy. Therefore, improving the performance of commercial

banks is an important way to improve China's international position in the world financial market and promote the sustainable development of domestic financial industry.

As an important part of the banking industry, the commercial bank plays the crucial leverage role in China's pursuit of economic development, and is the main body directly involved in market economy activities. In the early days of the People's Republic of China, China's banking industry was still under unified and backwater management by The People's Bank Of China(PBOC), while the implementation of the reform and opening up policy by the Chinese government has brought new opportunities for the development of the banking industry.

Over the 40 years of reform and opening up, China's commercial banks have scored achievements worldwide as they have doubled their operating performance, asset scale, deposit scale, and foreign capital introduction scale. As of the first quarter of 2019, China's banking industry boasts the total assets of over RMB275.82 trillion¹², ranking the first in the world. Six large state-owned commercial banks, including ICBC and CCB, and four joint-stock commercial banks, for example, CMB, are on the list of the world's top 500 companies released on July 22, 2019 in *Fortune*¹³. However, in the environment of Internet finance, China's commercial banks are encountering new challenges, while deepening reform proves the only way

¹² Source: People's Bank of China-Statistics of Assets and Liabilities of Financial Institutions at the End of the First Quarter of 2019

¹³ *Fortune*http://www.fortunechina.com/fortune500/c/2019-07/22/content_339535.htm

to maintain competitive edges and improve international competitiveness.

Financial system represents the core of modern economy, while the banking industry serves as a vital part of the financial system. Therefore, the reform and development of the banking industry hold the key to the success of the reform and development of China's financial system and even the entire economic system. Now, China's economy is in the transition from high-speed growth to high-quality development. In this critical period of transforming growth momentum, the services and support provided by the banking industry have become an important driving force for deepening the reform of the economic structure.

Meanwhile, with the deepening and accelerating development of economic globalization, the financial markets of various countries and regions interact closely. Against the backdrop of new era, new climate and new changes, the reform and development of China's banking industry is facing an important turning point. Now, the internal and external environment and business model of China's banking industry develop many new features and are faced with many new problems. These new problems require new ways of understandings and solutions. China's banking industry needs to carry the tough transformation and innovation as well as supply-side reform through to the end¹⁴.

With the in-depth development of global economic integration and the

¹⁴ Wang Songqi. China Commercial Bank Competitiveness Report. China Finance Press. 2018.

increasing openness of China's financial industry, the banking industry is facing competition from both domestic and foreign markets, including comprehensive competition in system, mechanism, science and technology, strategy, management and manpower. Therefore, how to improve the overall strength of China's banking industry and enhance the comprehensive competitiveness of China's commercial banks is a major topic facing China's banking industry and a hot topic based on other theories of economic and financial research.

Firstly, a comprehensive investigation and in-depth study on the operating performance of commercial banks will help to improve the risk management level of our commercial banks and promote their operating performance. On the one hand, through a comparative study of the performance of various commercial banks, each bank can find its own operating deficiencies and existing problems. On the premise of drawing lessons from its own advantages, each bank can break through the traditional operating concepts and modes and boldly explore ways and means to improve its own operating efficiency. At the same time, in the face of foreign banks entering China's banking industry under the premise of an open environment, the risks of China's commercial banks will surely increase further as the situation changes. The survival of the fittest in the banking market will inevitably lead to the elimination of commercial banks that lack operational efficiency in the new competitive environment. Therefore, improving efficiency is also the key way for banks to enhance their risk response levels.

Secondly, a comprehensive investigation and in-depth study on the operating performance of commercial banks will contribute to the overall stability and sustainable development of China's financial industry. The measurement of commercial banks' performance and the analysis of relevant empirical differences can well guide China's commercial banks to adopt more effective ways to improve their competitiveness. The key to optimize the allocation of financial resources in China lies in continuously improving the performance of commercial banks as its main body, which will eventually contribute to the all-round development of China's financial industry and enable China's financial industry to better go out and go up one flight of stairs to participate in international financial competition.

In the third place, a comprehensive investigation and in-depth study on the performance of commercial banks will help the national bank supervision department to formulate more scientific and reasonable supervision policies. At present, the development of various commercial banks in China's commercial banking system shows imbalance, and the gap in market share and asset size is very prominent. A comprehensive investigation and in-depth study on the operational efficiency of commercial banks will help the national bank supervision department to formulate a more effective bank efficiency evaluation in an open environment, discover and disperse relevant risks in time, and guide the rational allocation of financial resources.

At last, due to the economic system, exchange rate system, economic development stage, equity structure and other reasons, the performance of

China's commercial banks still has a lot of room for development. Therefore, this paper hopes to investigate the degree of difference between the performance of China's state-owned commercial banks and joint-stock commercial banks through the establishment of relevant index systems and models, specific performance aspects and causes, and then clarify the significance of the differences between them, and finally put forward reasonable reform proposals.

1.2 Research Status at Home and Abroad

1.2.1 Research Status of Foreign Scholars

The discussion on the management of modern financial institutions originates from the competitive pressure of financial institutions. Starting from the factors that affect the performance of financial institutions, western scholars have carried out in-depth analysis. Generally speaking, the evolution of performance evaluation in western countries can be divided into three stages, namely, cost performance evaluation stage, financial performance evaluation stage and operating performance evaluation stage.

In the first stage (1950s-1970s), foreign banks had a stable operating environment and strict supervision. Banks maintained relatively fixed deposit and loan spreads. Bank profits depended on their market share. Business development would inevitably lead to improved performance. Therefore, the operating objective was to increase the market share. The assessment focus was on the growth and market share of deposit and loan

business.

During this period, industrial organization theory was fully applied in bank performance evaluation. The earliest scholar who studied the relationship between bank size and efficiency was Alhadeff (1954)¹⁵. He used the ratio of total cost/credit and investment as the average cost index, and the income assets of credit and investment as the output, and analyzed the relevant data of 210 California banks from 1938 to 1950. The conclusion was that California branch large banks had greater output than single small banks, while the cost of small banks was almost twice that of large banks, that is, the banks had increasing output effect and decreasing cost effect.

Schweiger & McGee (1961)¹⁶ analyzed the cost of 600 U. S. banks with total assets as output. The results show that the cost of single-system banks decreases with the expansion of deposit scale, but the scale efficiency of branch bank cost is not so obvious.

Stider (1964) used the SCP framework of Bain(1951)¹⁷ to believe that in a highly concentrated market, large banks can reach collusive agreements without cost. By paying lower deposit interest rates and charging higher loan interest rates, large banks gain monopoly profits. Demsetz (1973, 1974)¹⁸ and Peltzman(1977)¹⁹ adopted the hypothesis of "effective structure" and

¹⁵ Raman Manandhar, John C.S. Tang. The evaluation of bank branch performance using data envelopment analysis: A framework. *The Journal of High Technology Management Research* 13.1(2002):1-17.

¹⁶ Benston,G. Economies of scale and marginal costs in banking operations.*National Banking Review*,1965,2:507-49

¹⁷ Bauer,P.W. Recent Development in the Econometrics Estimation of Frontiers, *Journal of Econometrics* 1990(46),39-56.

¹⁸ Demsetz,H. Industry structure, market rivalry and public. *Journal of Law and Economics* 1973(16),1-9

¹⁹ Peltzman, Samuel. The Gains and Losses from Industrial Concentration, *Journal of Law and Economics*,1977(20),229-63.

believed that efficient banks had better management or production technologies, thus reducing production costs and obtaining higher profits.

However, early researches on the performance of commercial banks mostly implied the assumption that every bank faced the same degree of risk, or assumed that commercial banks were risk neutral, and risk factors did not receive sufficient attention.

The second stage (1970s to 1990s) was a transition period from regulated to deregulated status for western banks as a whole. Due to the liberalization of interest rate control, gradual marketization of foreign exchange rate and relative relaxation of supervision, the operating environment of banks has become complicated and changeable, and pure business development may not necessarily lead to profit growth. In fact, the credit risks brought by blind business development (especially loans) led to a large number of losses for banks. Therefore, banks took profit maximization as their operating objective, and the assessment indicators were mostly return on assets (ROA), return on equity (ROE) and other indicators. Performance evaluation was at the stage of traditional financial reporting.

Representative models in this period included tS&VW model (David Stuhr, Robert Ban Qichlen, 1974)²⁰, JS model (Joseph Sinkey, 1975)²¹, DM model (Daniel Martin, 1977)²², KSM model (Leon Korobow, David Stuhr, Daniel

²⁰ David Stuhr, Robert Ban Qichlen. Rating and Financial Condition of Banks: A Statistical Aid Bank Supervision. Federal Reserve Bank of New York Monthly Review. 1974, (9):233-238.

²¹ Sinkey Jr., Joseph F. A Multivariate Statistical Analysis of the Characteristics of Problem Banks. Journal of Finance. 1975.30(4):21-37.

²² Daniel Martin. Early Warnings of Bank Failure: A Logic Regression Approach. Journal of Banking and Finance. 1977, (11):249-277.

Martin, 1977)²³, PP model (Colleen Pantalone, Marjorie Platt, 1987)²⁴, FF model (Donald R. Fraser, Lyn Fraser, 1991)²⁵. Summing up the common characteristics and laws of development and change of these models, we can easily find that although the content of bank performance analysis will be continuously enriched and refined with the passage of time, it is an eternal topic of bank performance analysis to meet people's requirements for a comprehensive and in-depth understanding of bank risks and benefits.

In 1972, American scholar David Cole introduced DuPont financial analysis system into the field of bank management. DuPont financial analysis system attached great importance to the integrity of bank management activities, highlighting the analysis of the coordination of bank management activities, which had considerable practical advantages. However, DuPont financial analysis system focused on evaluating the profitability of commercial banks and lacked the overall assessment of "three characteristics".²⁶ In the late 1970s, with the increase of international business, the operational risks of commercial banks increased. In order to prevent the operational risks, the performance evaluation system of commercial banks was further expanded. Based on the original performance evaluation index, a performance evaluation system with "three characteristics" including return on investment, interest spread rate, non-performing assets rate and current rate

²³ Leon Korobow, David Stuhr, David Martin. A Nationwide Test of Early Warning Research in Banking. Federal Reserve Bank of New York Quarterly Review.1977,(8):37-52.

²⁴ Colleen Pantalone, Marjorie Platt. Predicting Commercial Bank Failure since Deregulation. Federal Reserve Bank of Boston New England Economic Review.1987,(7):37-46

²⁵ Donald R. Fraser, Lyn M. Fraser. Evaluating Commercial Bank Performance. A Guide to Financial Analysis. 1991. (2): 12—24.

²⁶ Yang Dan. Financial Management [M]. Beijing: Renmin University of China Press, 2009.

was gradually developed, with financial indicators as the main operating performance evaluation system. At the same time, government performance evaluation and non-government evaluation (various rating agencies) were also involved in the operating performance evaluation of commercial banks.

In 1985, West²⁷ took 1,900 banks in 7 states of the United States from 1980 to 1982 as samples, and used factor analysis to find out that four of the common factors affecting bank operations in financial indicators complied with CAMEL principles, namely, asset quality, profitability, liquidity and capital adequacy principles. Factor analysis results can effectively evaluate the bank's operating conditions and point out the problem banks. The Logit financial early warning model was established by using the scores of its factors, and the correct discrimination rate reached 89.2%-91.9%.

In 1987, Arshadi and Lawrence²⁸ conducted an empirical study on the operating performance of 438 new banks established in the United States between 1977 and 1979. Using canonical correlation analysis, they found that the main factors affecting bank performance included deposit growth rate, operating cost, deposit interest rate, and loan decision.

The operating environment of the banking industry in the third stage (from the 1990s to the present) has faced great changes. With the advent of economic globalization and integration of the world economy, the frequent

²⁷ West R. C. A Factor—analysis Approach to Bank Condition, *Journal of Banking Finance*, 1985(9): 253-266.

²⁸ Arshadi, E.C. Lawrence. An Empirical Investigation of New Bank Performance, *Journal of Banking and Finance*, 1987, 33-48

use of financial instruments and the rapid changes in financial markets, competition has intensified in the global scope, and the theories of strategic management and performance evaluation should also develop and change with the requirements of the environment. Therefore, after entering the 1990s, the evaluation of non-financial indicators and human capital has become increasingly important in the evaluation index system of operating performance. Western scholars also pay more attention to the practical activities of bank performance analysis when studying the performance evaluation model of commercial banks. These practical activities are jointly led by banks, rating companies and regulatory authorities, further promoting the in-depth development of bank performance evaluation. Generally, by establishing the index system, adopting statistical methods, expert system, neural network technology and other methods, selecting and establishing evaluation models such as regression analysis, multivariate discriminant analysis, Logit method, Probit method, etc. , to analyze and evaluate the performance of commercial banks, these models and methods have been widely used.

In the 1990s, Stern Management Consulting Company of the United States took the lead in proposing a new corporate governance structure system, which was based on Economic Value Added (EVA) and uses EVA method to give more accurate feedback on enterprise performance. Some well-known commercial banks in the West, such as Royal Bank of Canada, Citibank, Standard Chartered Bank, HSBC Bank and National Bank of Australia, all

took value maximization as their operating index, introduced EVA into the management system, took EVA as the core index of bank performance evaluation, and implemented the incentive and restraint mechanism based on EVA evaluation.

Roth and Vander Velde (1991)²⁹ analyzed how factors such as marketing, business design, organizational structure and human resources affected bank performance from the perspective of financial institution strategy implementation.

In 1997, Neely and Wheelock³⁰ used regression analysis to study the operating performance of banks in various states of the United States from 1994 to 1995. It was found that the government financial management policies, economic activity, market structure and scope of banking business in various states had significant effects on bank performance. It was found that factors such as economic growth and deregulation of financial laws and regulations had a positive impact on the bank's operating performance from 1980 to 1990.

The Banker, an authoritative publication published by the *Financial Times*, publishes its ranking list of 1,000 banks in the world every July. Its assessment plan is the first and most complete approach to the *Basel Accord*. It evaluates banks from seven aspects of data such as strength, stability,

²⁹ Roth, A. V., Vander Velde, M., Operations as marketing: a competitive service strategy. *Journal of Operations Management*. 1991. 10(3): 303-328.

³⁰ Neely Michelle Clark and Wheelock David C., Why Does Bank Performance Vary Across States, *Federal Reserve Bank of St. Louis*, 1997. 2, 27-40.

profitability, performance, capital and risk weighted asset ratio, and comprehensive credit rating level.

1.2.2 Research Status of Chinese Scholars

The academic research on the performance of commercial banks in China is still in its infancy. In recent years, there have been many articles and books on the performance of commercial banks in China. At present, Chinese scholars mainly use relevant models to explore the influencing factors of commercial banks' operating performance by constructing performance evaluation system. For example, Zhao Xu (2001)³¹ used DEA method to study the relationship between market structure, efficiency and performance of commercial banks in China on the basis of analyzing the traditional collusion hypothesis and effective structure hypothesis, and found that efficiency was an important determining factor affecting the performance of commercial banks.

Tan Zhongming (2002)³² analyzed the operating efficiency of ten domestic banks and two foreign banks (Citibank and Bank of America) by factor analysis in multivariate statistical analysis. Sun Weiyi and Li Pinglian (2017)³³ respectively selected core indicators according to the five major aspects of camel rating system, and constructed a hierarchical and comprehensive evaluation index system from the business continuity, regional coverage and

³¹ Zhao Xu and Zhou Junmin, International Comparative Study on Efficiency of Commercial Banks, Journal of Yunnan University of Finance and Economics, 2001 (6): 40-45

³² Tan Zhongming, Efficiency Analysis of Commercial Banks in China, China Soft Science, 2002(3)

³³ Sun Weiyi, Li Pinglian. Study on the Construction of Operational Performance Evaluation Index System of Commercial Banks in China [J]. Times Finance, 2017(32):131-132.

social performance of commercial banks in combination with the development characteristics and risk factors of commercial banks in China. Li Jinlei, Fang Lei and Wang You (2019)³⁴ introduced functional data analysis method to evaluate the bank performance dynamically and investigate the dynamic influence of relevant factors. Firstly, the intrinsic function of discrete data was reconstructed by rough penalty, and the discrete performance observations were smoothed into continuous derivable curves. Furthermore, the derivative analysis method was used to visualize the velocity and acceleration curves of the performance level curve and analyze its dynamic change process from a dynamic perspective. On this basis, a functional regression model was established with bank performance as independent variable and influencing factors as dependent variable, and the dynamic influence of different factors on bank performance over time is graphically displayed. Luo Xin and Chen Jia (2017)³⁵, through the construction of a comprehensive performance evaluation index system, through 16 listed banks 11 index data during the year of 2014-2016, used DEA combined with AHP to obtain the weight of each index, ranked the results, and gave suggestions on the future development of commercial banks.

³⁴ Li Jinlei, Fang Lei, Wang You. Dynamic Evaluation of Commercial Bank Performance and Analysis of Its Influencing Factors [J]. *China Business Theory*, 2019(13):79-84+141.

³⁵Luo Xin, Chen Jia. Research on Comprehensive Performance Evaluation of China's Commercial Banks Based on DEA [J]. *Mall Modernization*, 2017,(20):104-105.

1.3 Research Content and Ideas

1.3.1 Research content of this article

(1) Review and evaluation of relevant research literature at home and abroad; (2) the reform and development process of China's commercial banks and the existing problems; (3) Performance comparison between state-controlled and non-state-controlled commercial banks; (4) Establishment of performance evaluation system of state-owned and non-state-owned commercial banks and DEA empirical analysis; (5) Research conclusions and suggestions for future development.

1.3.2 Text Structure

According to the above analysis, this paper studies on the basis of the theoretical circle's literature review on the core competitiveness theory and the research on the core competitiveness of state-owned commercial banks and non-state-owned commercial banks such as operating performance. The content of the article is as follows:

The introduction of Chapter I is a summary of the whole paper, which gives a general introduction and explanation of the background, significance, research content and ideas, research methods, innovations and deficiencies of the article.

Chapter II is Basic Theory and Literature Review. Firstly, it defines the concept and characteristics of core competitiveness in general sense, and

analyzes and explains the concepts and theoretical research of competitiveness, core competitiveness, competitive advantage, etc.

Chapter III mainly expounds the reform and development process of China's commercial banks. Through the four stages of completion, tortuous development, dividend release and transformation development under the new normal, it sorts out the development sequence of China's commercial banks, and points out the difficulties and problems existing in the reform at all stages of development.

Chapter IV analyzes the index change trend of the sample banks from 2007 to 2018 by constructing the corresponding evaluation system, selecting the appropriate samples, sorting out and analyzing the corresponding panel data through the indicators of equity structure, scale strength, profitability, security capability, capital flow capability, etc.

On the basis of the previous chapter, Chapter V makes an empirical analysis on the performance evaluation of the sample commercial banks by constructing the performance index system and using the data envelopment analysis method, and analyzes the causes of the performance differences through the analysis results.

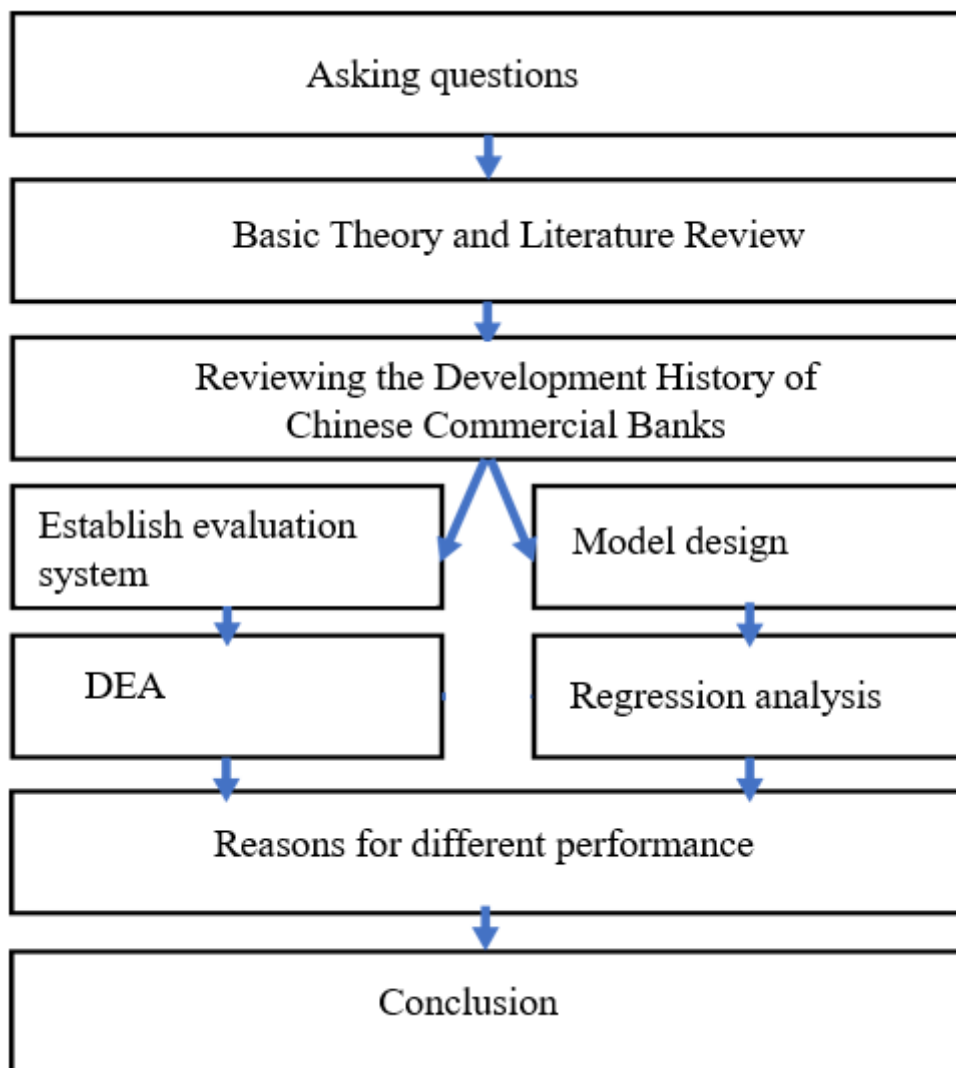
In order to further explore the reasons for the performance differences between state-owned commercial banks and non-state-owned commercial banks, Chapter VI explains the results of the Chapter V, using the regression analysis method to construct five models to analyze the impact of ownership

concentration and the state-owned and non-state-owned shareholders on operating performance

Chapter VII combines the background of the second chapter, synthesizes the analysis results of the third to the sixth chapters, summarizes this paper, and verifies that the hypothesis put forward in the first chapter is true proposition.

1.3.3 Research Framework

Figure 1-2 Research Framework



1.4 The methods in this paper

Guided by the theories of political economics, industrial economics, finance, econometrics and management, and drawing lessons from relevant theories, this paper adopts the methods of literature research, case analysis, combination of normative analysis and empirical analysis, combination of comparative research and comprehensive analysis, and combination of qualitative research and quantitative research.

First of all, literature is defined as "all carriers of knowledge that have been published or that have not been published but have been collated and reported", including printed materials such as periodicals, degree papers, and archives, as well as various materials appearing in physical form and in the network. The literature research method is an indirect research method, which refers to a series of processes of collecting, identifying and collating documents to form a scientific understanding of facts through literature research. In scientific research, full possession of data is one of the prerequisites. Only with full possession of a wide range of data can it be possible to conduct in-depth research on the literature, grasp the relevant research trends and academic frontier development, and thus understand the previous research results and the current research status. Generally, it includes five links: proposing topics or assumptions, researching and designing, collecting literatures, accumulating literatures and summarizing literatures. Starting from the research of existing literature, this paper extensively collects relevant academic papers, periodicals, conferences,

briefing papers and other materials at home and abroad. Through in-depth research, it focuses on the application of relevant economic theories, sums up the definition of the core competitiveness of commercial banks abroad, deeply analyzes the influencing factors and evaluation system of the core competitiveness of state-owned commercial banks, and finds the best way to effectively enhance the core competitiveness of state-owned commercial banks. Secondly, the combination of theoretical research and empirical research. Empirical analysis is the main analysis method of economics, which mainly answers "what is the economic phenomenon" or "how is it actually solved" to study the economic problems faced in reality. Through the investigation of many phenomena and changes in history and reality, regular conclusions are drawn from them, and relevant economic theory systems are established on this basis. At the same time, as far as methodology is concerned, normative analysis studies the "what should be" or how economic problems should be solved in economic activities. As for the core competitiveness of commercial banks, normative economic analysis is especially needed as its theoretical basis. At the same time, it is also necessary to combine empirical analysis methods with certain econometric mathematical statistical methods for analysis. There is a great difference between economics and management in the interpretation of core competitiveness. This paper focuses on the application of economics theory to explain what is the core competitiveness of commercial banks and what factors affect the core competitiveness of state-owned commercial banks. At the same time, it discusses how to evaluate the core competitiveness of state-

owned commercial banks.

Thirdly, the combination of qualitative analysis and quantitative analysis. Quantitative analysis is to use statistical data, and establish a mathematical model, according to the characteristics of the research object, through the calculation of the model, analysis of the indicators and values of the research object. Compared with quantitative analysis, qualitative analysis is the premise and foundation of quantitative analysis. Generally speaking, it refers to the method of judging the research object according to the researcher's experience and subjective judgment, and in combination with various situations of the research object on the time series. On the whole, the research in this paper lays a theoretical foundation with qualitative research, calculates the core competitiveness of China's commercial banks by combining quantitative analysis methods, and systematically analyzes the calculation results to explore the paths and countermeasures for China's commercial banks, especially the state-owned commercial banks, to effectively enhance the core competitiveness.

1.5 The main innovations and deficiencies of this paper

1.5.1 Innovation of This Article

1. Starting from the perspective of economics, this paper abandons the extensive and complicated research methods of the past core competitiveness research, combs the theoretical definition of core competitiveness through literature research, combines the particularity of state-owned commercial

banks, innovates the concept of core competitiveness, and standardizes the core competitiveness of state-owned commercial banks in terms of definition, that is, under a certain level of production technology, social-economic system and comprehensive social development. Commercial banks can provide some special values to customers in a competitive market environment and are not easy to be imitated by rivals, so that commercial banks can maintain long-term, stable, sustainable, dynamic and comprehensive internal capabilities in the future. It is a dynamic capability of commercial banks to exploit their natural resources and external market environment to expand the existing market, create future opportunities and win competitive advantages in the long run, taking into account social responsibilities.

2. Systematically analyze the core competitiveness on the basis of more rigorous theory, specifically on the basis of Porter's value chain theory, analyze the value chain of China's commercial banks. Based on in-depth research on the internal and external value chains of commercial banks, analyze the constituent factors of the core competitiveness of state-owned commercial banks, and establish the foundation for the subsequent construction of the evaluation system of the core competitiveness of state-owned commercial banks.

3. Based on the qualitative analysis of the definition and influencing factors of state-owned commercial banks, an evaluation index system of core competitiveness of state-owned commercial banks is initially established on

the basis of 4 criteria layers and 12 index layers. Based on panel data, the core competitiveness of five state-owned commercial banks and seven non-state-owned commercial banks in China is ranked by AHP (analytic hierarchy process), and the relative strength of the core competitiveness of state-owned commercial banks in China is quantitatively analyzed.

4. At present, China's banking system is relatively perfect but complicated. Under the coexistence of banks with various attributes, such as policy banks, large state-owned commercial banks, joint-stock commercial banks, urban commercial banks, housing savings banks, private banks, rural commercial banks, rural cooperative banks, rural credit cooperatives, village banks and foreign legal person banks, it is also the focus of this article to construct a reasonable and effective performance evaluation system and do an efficient and intuitive analysis of relevant indicators. Through reviewing the development and reform process of Chinese commercial banks, the operating performance of some commercial banks in the past 11 years has been structured, and the reasons for the differences in operating performance of commercial banks of different natures have been found out, which is the highlight of this article.

5. By introducing panel data, this paper first compares the performance of the sample commercial banks, and obtains the preliminary results. Then, the data is imported into CRS model with constant returns to scale, and the efficiency of their operation ability, profitability and growth ability is analyzed by envelopment analysis method. The preliminary results are

explained and supported by the analysis results, and the gap between state-owned commercial banks and non-state-owned commercial banks is obtained. Finally, regression analysis is used to explore the relationship between the the proportion of state-owned shares and the management of the bank's operating performance, and the analysis results are obtained. Combined with the development background of China's commercial banks in the third chapter, the preliminary analysis results of panel data and DEA analysis results, the reasons for the differences between state-owned commercial banks and non-state-owned commercial banks are obtained. On the basis of historical development facts, we obtain the reason analysis based on historical facts through the data arrangement and analysis of business performance. This method can provide a reference for the performance difference analysis of commercial banks and even the performance difference analysis of enterprise management.

1.5.2 Research Deficiencies

Due to the influence of personal academic research ability, writing time and references, the research in this paper still has the following deficiencies, which need to be improved in future research:

1. At present, the academic research on the theory of core competence is still in the "Warring States" era, and there is a lack of relevant documents and materials for systematic research on the theory of core competence. At the same time, the theories of various branches of industrial economics are

in the process of continuous improvement. How to systematically understand the core competence from the perspective of standardized industrial economics is very difficult.

2. Studying the core competitiveness of state-owned commercial banks requires a thorough understanding of China's banking industry. As China's state-owned commercial banks are in a constantly changing internal and external market environment, and the influencing factors of their core competitiveness are also in a dynamic state, the comprehensiveness and rationality of the design of the index system for evaluating the core competitiveness of state-owned commercial banks need to be further improved.

2. Overview of the Concepts and Methods of Commercial Bank Performance Evaluation

2.1 Elaboration of Related Concepts of Operating performance Evaluation of Commercial Banks

2.1.1 The Meaning of Operating performance and Operating performance Evaluation

(1) Operating performance

Before discussing the operating performance evaluation of commercial banks, we should first clarify the meaning of operating performance.

According to the existing research literature, scholars have two views on the meaning of operating performance: one is to regard operating performance as output, that is, operating performance output theory; and the other is to regard operating performance as an act, that is, operating performance behavior theory. The output theory holds that the operating performance of an organization should refer to the records generated by specific work functions or activities within a specific period of time, and the level³⁶ of operating performance should be judged by the completion of an organization's strategic objectives. Behaviorism holds that some factors have an obvious and direct impact on the results of an organization's work compared with other factors. Operating performance can be equivalent to these behaviors. These behaviors that can affect the organization's strategic objectives are operating performance³⁷.

These two viewpoints have their own bases, but they also have their own shortcomings. If the management performance is only regarded as a kind of production management, it will easily lead to the short-term behavior of the enterprise, neglect the effective allocation of enterprise resources, and dampen the enthusiasm of employees. If performance is only regarded as a kind of behavior, it seems to be fairer and more reasonable than the result. However, due to the lack of target incentives, the expected output will not be realized and the enterprise will not be able to operate finally. Moreover,

³⁶ Zhang Jianguo, Xu Wei. Performance System Design [M]. Beijing: Beijing University of Technology Press. 2003: 18-35.

³⁷ Chen Fang. Performance Management [M]. Shenzhen: Haitian Publishing House. 2002: 6-8.

there is still no effective evaluation standard for the simple behavior evaluation, and its practical operability is not strong. Therefore, this paper takes these two viewpoints into consideration and holds that operating performance is actually both an output and an act, and the two complement each other and are inseparable. Operating performance as output is the result of behavior, operating performance as behavior is to achieve a certain goal, that is, to obtain a certain output is the result.

(2) Evaluation of operating performance

Evaluation refers to that the evaluation subject judges the "superior" and "inferior" of the function, role and effect of the evaluated object according to certain methods and standards or compared with similar things. Management performance evaluation is to design the corresponding evaluation index system according to the enterprise's objectives, and to make objective and accurate comprehensive judgment on the enterprise's management performance during a certain period of operation by using specific evaluation methods according to specific evaluation standards. Performance evaluation belongs to the category of management work and is essentially for the business management service of the enterprise. Its history is quite long. It originated from the initial comparison of labor achievements and labor costs, but its real development was after the 16th century. With the emergence of modern company system and the separation of ownership and management rights, owners need to use certain methods to evaluate the operating performance of operators. Because even if the enterprise's

restraint mechanism is perfect, due to the asymmetry of information, the efforts and management level of the operators may still not be fully understood³⁸ by the owners. Therefore, when the constraint mechanism cannot solve these problems, the management performance evaluation can reward the results of the efforts of the operators on the basis of scientific evaluation of the management performance, play the role of the incentive mechanism, to a certain extent, can make up for the defects of the constraint mechanism and encourage the operators to better fulfill the objectives required by the owners.

2.1.2 Discussion on Relevant Concepts of Commercial Banks' Operating Performance

(1) The operating performance of commercial banks

The operating performance of commercial banks is the result of the joint action of multiple factors. As for the operating performance of commercial banks, there has not yet been a consensus definition accepted by the academia. A modern commercial bank is a financial enterprise established according to the organization mode of modern company system. In essence, it is the same as other enterprises. Its basic goal is to maximize the value of enterprises. However, commercial banks also have their own particularity of operation. Apart from their profit-making objectives, they also have safety and liquidity requirements. At the same time, because commercial banks

³⁸ Zhang Weiyong. Entrepreneur-Contract Theory of Enterprises [M]. Shanghai: Joint Publishing Company. 1995: 67-82.

have strong influence in the economic and financial fields, their requirements for operational risk control ability are higher than those of ordinary enterprises. Therefore, in combination with the meaning of operating performance mentioned above, this paper defines the operating performance of commercial banks as: under the effect of market mechanism, within a certain operational period, according to the basic operating principles of profitability, safety, liquidity, development capability, etc., and centering on the goal of maximizing the value of the enterprise, commercial banks shall reasonably allocate and make full use of the economic resources owned by the enterprise, and provide financial products and services that meet the needs of the market, showing the operating performance, operating efficiency, risk management level and sustainable development capability.

(2) The evaluation of commercial banks' operating performance

According to different performance evaluation angles, bank performance evaluation can be divided into commercial bank's evaluation to bank employee performance, commercial bank's evaluation to the performance of various functional departments, and commercial bank's comprehensive evaluation to its overall performance level. The main content of this paper is the comprehensive evaluation of the overall operating performance of China's commercial banks. In fact, the evolution of management performance evaluation is not only the result of enterprise system changes, but also the needs of its own changes. People's understanding of bank

management is also deepened through evaluation activities. This paper holds that the performance evaluation of commercial banks refers to the comprehensive evaluation and evaluation of the operating performance, operation efficiency, risk management level and sustainable development ability of commercial banks in terms of the use efficiency of economic resources possessed by commercial banks and the provision of financial products and services that meet the needs of the market, starting from the enterprise nature of commercial banks.

The evaluation of commercial bank's operation performance generally includes two aspects. The first aspect is to determine the criteria and methods of commercial bank's operation performance evaluation, and to judge and evaluate the level of commercial bank's operation and management. The second aspect is to find out the effective ways to improve the operation status and efficiency of commercial banks by analyzing the conclusions drawn from the evaluation. Through the performance evaluation of commercial banks, managers can decide the bank's next development strategy, investors can make decisions on whether to invest, which bank or which banks to invest, and regulators can correctly guide the operation of commercial banks in China and promote the healthy and harmonious development of China's banking industry.

2.2 Review of Relevant Methods for Performance Evaluation of Commercial Banks

2.2.1 DuPont Analysis

DuPont Model is one of the most famous models applied in the evaluation of commercial banks' operating performance in the theoretical circle. This model is named after David Cole applied DuPont's financial management principles to the field of bank management. Its core is to analyze various factors affecting the profitability of banks by decomposing the Return on equity (ROE) of banks.³⁹ In the model, the indicators to measure the overall profitability of banks include two important parameters: Return on equity (ROE) and Return on assets (ROA).

Return on equity (ROE) is the quotient of the bank's net income and shareholders' equity, which represents the net income of each unit of the bank's equity before dividends. The larger this number is, the higher the profitability of bank equity is. Return on assets (ROA) is the quotient of the bank's net income and the bank's total assets, which represents the net income of the bank's unit assets. The higher the value of this indicator, the higher the profitability of bank assets. ROE is equal to the product of ROA and Equity multiplier(EM), which can be expressed as $ROE=ROA*EM$ ⁴⁰. Equity multiplier is the quotient of the bank's total assets and shareholders'

³⁹ Bie Xiumei, Liu Shifei. A Comprehensive Financial Analysis Model: DuPont Analysis [J]. Modern Commercial Bank, 1997, (5): 58-59

⁴⁰ Zhou Hongyang. Management and Practice of Modern Commercial Banks [M]. Beijing: China Finance Press. 1997: 103-125.

equity. This method starts from the most comprehensive and representative index of evaluating enterprise performance, the common equity return rate, and decomposes it layer by layer into the use of the most basic factors of production, the composition of costs and expenses, and enterprise risks. It can meet the needs of operators for evaluation through financial analysis, and can find out the causes and correct them in time when the operation changes. ⁴¹

Through the composition of DuPont's financial analysis system, we can see that the evaluation index in DuPont's financial analysis model involves all aspects of bank operation. It indirectly reflects all aspects of bank operation and their restrictive relationships through the highly comprehensive common equity yield index, which can be used to conduct a comprehensive analysis and evaluation of bank performance and has a good guiding role in improving the bank's financial management. However, DuPont's financial analysis method also has three shortcomings: first, it ignores the differences in the goals pursued by different banks. Second, when a bank participates in off-account business projects, the bank's total assets are no longer the only meaningful measure. Third, traditional performance analysis does not explain how banks create shareholder value.

2.2.2 Market Value Analysis and Evaluation Method

This method is based on the assumption that the financial currency market

⁴¹ Peter Rose.Commercial Bank Management [M].Copyright 1996 by Richard D.Irwin:164-216.

is fully effective, and the stock market prices of the banks traded on the market fully reflect the real value of the banks. Simply put, the value of a bank's stock is the product of its Earning Per Share and its P/E ratio. The bank's market value analysis method is based on two concepts: the free cash income of shareholders and the difference management model. The free cash income FC of shareholders can be expressed as:

$FC=(NI+NC)+(S-U)=D$ where: NI is the net income of the bank; NC is bank non-cash expenditure; S is the source of funds in the bank's balance sheet; U is the use of funds in the bank's balance sheet; D is the dividend of bank shareholders;

(NI+NC) represents the current cash income from bank operations;

(S-U) indicates the cash expenditure required for changes in the bank's balance sheet. ⁴²

The difference management model calculates the net income of the bank by managing the difference between the interest rate of the bank's loan funds and the interest rate of the borrowed funds, and the net income is the main factor affecting the market value of the bank. This management mode assumes that the retail banking department (deposit department) raises funds within the bank, while the wholesale banking department (loan department) uses funds, and the bank headquarters dispatch funds to be transferred from the retail department to the wholesale department. If the capital transfer

⁴² Li Xiyi, Ren Ruoen. Efficiency Change and Trend Analysis of State-owned Banks. China Soft Science, 2004, (1), 57-61.

price set by the bank's headquarters is unreasonable, the profits of the bank's retail department will be different from those of the wholesale department. If the bank's internal sources of funds cannot meet the needs of the use of funds, the bank needs to obtain higher-cost external sources of funds in domestic and foreign money markets or capital markets. The opportunity cost provided by the retail department of the bank to the wholesale department constitutes the price for the internal transfer of bank funds.

Market value analysis is simple and easy to carry out, but it is difficult to judge the value of banks that are not listed, and it is also difficult to judge the value of banks that are listed but whose stock transactions are not active.

2.2.3 Balanced Scorecard Method

Balanced scorecard performance evaluation method is an enterprise performance evaluation system and a management system⁴³ developed by American scholars Robert Kaplan and David Naughton in the 1960s. As a performance evaluation system, the balanced scorecard adopts a series of financial performance evaluation indexes and non-financial performance evaluation indexes. Its financial indexes mainly include profit indexes and return on investment, while non-financial indexes mainly include customer satisfaction, internal production and operation process, and innovation and improvement ability. Non-financial indicators can supplement financial indicators from the perspective of customers, internal business process, and

⁴³ Robert S. Kaplan, David P. Norton. Putting the Balanced Scorecard to Work. Harvard Business Review[J]. September-October, 1993:77-102

learning and growth to measure the operating performance⁴⁴ of commercial banks. The performance evaluation method of the balanced scorecard overcomes the defect of evaluating the bank's performance only by financial indicators, and forms a comprehensive evaluation index system by adopting product quality, consumer satisfaction, market share, innovation ability and financial data, which comprehensively reflects the current operation situation and development prospect of the bank. More importantly, the balanced score method solves the defect that the traditional performance evaluation method cannot link the bank's long-term goals with short-term actions and cannot link the organization's overall goals with individual goals. It uses information technology to put all the objectives of the organization into a form, so that the objectives of the entire organization, departments, business units and employees can realize coordinated operation, bring into play the great potential of the human capital of the entire organization, and improve the performance of commercial banks.

However, the balanced scorecard method is complicated to use and requires a lot of work. It is difficult to quantify a large number of non-financial indicators in the evaluation. When the cost is the same, it also involves the task of assigning weights to different indicators. In the comprehensive evaluation, it is necessary to not only assign weights between different levels, but also assign weights between different indicators at the same level.

⁴⁴ Zhao Guojie, Zhao Hongmei. Construction of Performance Evaluation System for Commercial Banks Based on Balanced Scorecard. *Modern Finance [J]*.2004, (5): 3-7

This work is also relatively difficult, because when assigning weights to performance evaluation indicators, balanced scorecard mainly relies on evaluation methods such as expert scoring method, which is mainly a subjective evaluation method and is greatly influenced by individual evaluation. Different people and different environments often get different results. The accuracy and objectivity of evaluation results are questionable.

2.2.4 Data Envelopment Analysis

Data envelopment analysis (DEA), as a typical representative of the effectiveness performance evaluation method, was not officially published until the 1980s. The analysis method focuses on the use of empirical models and relies on the application of mathematical and statistical methods to determine the relatively effective production front. Input decision-making units and output decision-making units are projected onto the DEA production front at the same time, and the relative effectiveness of input and output indicators is evaluated by comparing the degree of deviation from the production front. DEA can not only evaluate the efficiency, but also identify the causes of inefficiency. There is no need to standardize the input and output items. Moreover, DEA can use linear programming method to judge whether a decision-making unit is effective or not. At the same time, it can also identify the due input and the due output that make a decision-making unit effective. This can set a benchmark for the performance of the target decision-making unit, and at the same time provide a lot of useful and comprehensive information for the management, which is conducive to

improving the efficiency of the target decision-making unit. At the same time, as an objective multi-index decision-making method, DEA does not need to set weight coefficients for each index in advance, so DEA empirical analysis reduces the interference of many subjective factors, and its evaluation results can more objectively reflect the actual situation of the target decision-making unit.

From the above simple comparative analysis of the four bank performance evaluation methods, we can know that although the financial index evaluation method is the basis of financial analysis and performance evaluation, its evaluation limitations are also extremely obvious. Economic value added method and balanced scorecard method, as new methods of bank performance evaluation, are better than simple data analysis of financial ratio, and also reflect the evolution process of performance evaluation from simple financial data analysis to comprehensive evaluation analysis. However, based on the particularity of the banking industry itself and the different requirements of bank performance evaluation, we believe that DEA is more suitable for the requirements of bank performance evaluation.

3. Reform and Problems of China's Commercial Banks

3.1 Initial Completion of the Banking System (1984-1993)

Under the background of the gradual development of China's national economic system, China's commercial banks have gone through a long development process. In terms of the transformation of economic system,

over the past 40 years of reform and opening up since 1979, China's commercial banks have been adhering to Deng Xiaoping's proposition that "banks must truly become banks", which was put forward at the forum of the first secretaries of provincial, municipal and autonomous regional committees in October 1979,⁴⁵ and China's commercial banking industry has undergone plenty of reforms and institutional changes in the context of structural changes of the macro-economic system. China's commercial banks have been growing rapidly on the fronts of operating performance, asset scale, deposit scale and foreign capital introduction scale, and have made measurable achievements, playing an increasingly important role in the sound and rapid development of the national economy.

3.1.1 The starting point of China's commercial bank reform

In 1978, the Third Plenary Session of the Eleventh Central Committee of the Communist Party of China was held, which brought about a fundamental change in China's economic structure. At the meeting, it was decided to shift the focus of the Party's work to economic construction and the task of economic system reform was put forward. Since then, the original planned economic system gradually changed, the economic subject began to make economic decisions automatically, and the economic system structure has undergone tremendous changes.⁴⁶ On the one hand, the ability to save has

⁴⁵ Chen Yimin. Adhering to Deng Xiaoping's Thought of Financial Reform to Make Banks Real [J]. *Financial Theory and Practice*, 1997(05):3-5.

⁴⁶ Sun Yu. The Third Plenary Session of the Eleventh Central Committee of the CPC and the Start of Opening up policy [J]. *Journal of Changsha University*, 2018,32 (03): 9-12.

been improving as a result of the substantial increase in per capita disposable income. In 1949, the per capita disposable income of Chinese residents was only RMB49.7, which increased to RMB343 in 1978 and to RMB1,701 in 1991. While in 2018, the per capita disposable income of Chinese residents reached RMB28,228, an increase of 566.6 times in nominal terms, 59.2 times in real terms after deducting price factors, registering an annual real growth of 6.1%. Economic demand for funds is gradually increasing, yet banks do not play a fundamental role in the allocation of their own financial funds under the "unified" system, where funds are allocated and controlled through administrative instructions.

On the other hand, the financial capacity of the state has dropped rapidly, and the proportion of available social resources for the government in the total social resources has dropped rapidly. From 1978 to 1994, the proportion of Chinese government revenue in the GNP dropped from 31.2% to 12.6%. The ability of the government to allocate social resources has been vigorously declining, which directly leads to the fact that the financial funds fail to continue to meet the capital needs of enterprises. The "unified" banking system no longer caters to the needs of the development of economic restructuring, and economic development entails the support of a scientific banking system.

The period from 1979 to 1984 was a time of preparation for China's economic transition, during which China began to implement the reform and opening up, the banking system began to gradually recover and banks began to give

play to the role of financial capital allocation. The development of China's banking industry has substantially promoted the smooth economic transition and development.

In 1978, the First Session of the Fifth National People's Congress decided to separate the head office of the people's bank of China(PBOC) from the Ministry of Finance, marking the beginning of the construction of modern Chinese banking system. Then PBOC began to exercise the functions of the Central Bank, and agricultural bank of China(ABC), bank of China(BOC), China construction bank(CCB) and industrial and commercial bank of China (ICBC) were reinstated successively. In 1979, PBOC opened short- and medium-term equipment loans, breaking the old rules that only banks were allowed to issue circulating capital loans.⁴⁷ In February 1979, the State Council issued the Circular on Restoring the Agricultural Bank of China, stipulating that ABC shall be managed by PBOC on behalf of the State Council as it is a directly affiliated institution of the State Council, and its main tasks are to uniformly manage fiscal funds for supporting agriculture, centralize rural credit handling, lead rural credit cooperatives, and develop rural financial undertakings. This marks the beginning of China's financial reform.

In March 13, 1979, the State Council approved and transmitted Request for Instructions on the Reform of BOC System by PBOC to expand the powers

⁴⁷ Song Cuiling. Empirical Research on the Impact of Banking Opening on Banks' Competitiveness [D] .Suzhou University, 2013.

of the BOC, which is directly under the leadership of the State Council, and is managed by PBOC on behalf of the State Council. Meanwhile, State Administration of Foreign Exchange shall be established to be authorized to manage state foreign exchange. The BOC shall be separated from PBOC and the former General Administration Division of BOC shall be changed into the head office of the BOC. The State Administration of Foreign Exchange shall exercise the functions and be responsible for the unified operation and centralized administration of foreign exchange throughout the country. From 1979 to 1980, BOC carried out structural reforms and the State Administration of Foreign Exchange was established.

In 1980, the first urban credit cooperative was listed in Hebei Province. Large-scale construction began in succession throughout the country, and CCB came into being to manage a large amount of construction funds. During the two decades from 1954 to 1978, CCB mainly assumed the responsibilities of centralizing the state capital construction budget allocation and enterprise self-raised funds allocation, supervising the rational use of funds, issuing short-term loans to construction enterprises, and handling basic business settlement. In 1983, CCB was reestablished. While continuing its original functions, CCB expanded its banking functions, successively opening various businesses, such as credit fund loans, residents' savings deposit, foreign exchange business, credit card business, policy-oriented housing reform finance and personal housing mortgage loans. Since January 1, 1984, PBOC has terminated its commercial banking

business and become the bank of banks as it stops dealing with credit business for enterprises and individuals and only accepts inter-bank business. It also specializes in functions of the central bank, such as financial management, formulation and implementation of monetary policy. At the same time, the newly established ICBC started to be in charge of industrial and commercial credit and savings business, which were handled by the former PBOC.⁴⁸ The establishment of ICBC in 1984 marks that fundamental changes have taken place in the organizational system of China's banking industry and the "unified" banking system was broken. Until then, the basic framework of the central bank system has been preliminarily established. And a two-tier banking system of the central bank and the commercial financial system has been formed. In addition, China's banking industry began to open gradually, breaking the long-term closed state in the past, and began to connect with the world banking industry. BOC has set up branches in New York, Tokyo, Paris and other places gradually.

By 1984, China's banking reform had taken the first step, initially achieving the separation of financial funds and credit funds, laying the foundation for the central bank and specialized banks, and forming a system in which specialized banks perform their respective functions. However, this is still not the banking system that meets the needs of the market economic system. The central bank is still closely related to finance. Although the four major

⁴⁸ Chen Yuanqiao, Wang Ke, Dong Jing. Reviewing the 35 years of development and important achievements of Industrial and Commercial Bank of China [J]. *Modern Commercial Bank*, 2019 (19): 53-60.

banks are national specialized banks, they are not established according to the ideas and models of commercial banks, yet they are arranged according to the division of responsibility in the planned economy. The four specialized banks have to remain responsible for government functions in their respective areas. ICBC mainly undertakes urban industrial and commercial credit business; ABC is mainly engaged in rural credit business; BOC mainly undertakes medium- and long-term investment and credit business; CCB mainly handles the credit business of fixed asset investment. This gives rise to its own inherent administrative monopoly, while the scope of its business and the price of funds are also determined by the government. Such circumstance is obviously contradictory and conflicting with the development of market economy, so it constitutes the objective necessity and realistic starting point of the reform and development of China's commercial banks.

3.1.2 Reform of state-owned specialized banks

In the early stage of China's commercial bank reform, the four banks had their own division of responsibility. ICBC mainly undertakes urban industrial and commercial credit business; ABC is mainly engaged in rural credit business; BOC mainly undertakes medium- and long-term investment and credit business; CCB mainly handles the credit business of fixed asset investment. Such clear market division determines that each of the four banks has a clear market positioning. The four banks are uncompromising in their respective areas of division, and this "hegemonic" status is entirely

from the administrative division, which inevitably leads to the poor attitude of banking services at that time. As bank loans are scarce resources, the marketing of the banking industry seems impossible.

With the deepening of financial reform, the traditional division of responsibility among state-owned banks has been gradually toppled. In December 1993, the *Decision of the State Council on Reform of the Financial System* further clarified that the main function of PBOC is to formulate and implement monetary policies and maintain the stability of the value of the currency. It exercises strict supervision over financial institutions to ensure the safe and effective operation of the financial system. The State Council was almost unanimous in that "financial reform should take precedence", and it also set out what still does not seem outdated nowadays that "marketization of interest rates and commercialization of banks." The financial reform started at the end of 1993 can be regarded as a new milestone in the reform of China's banking industry, and the marketing competition of commercial banks has been unveiled since then.⁴⁹

In 1994, the government separated the policy business from the commercial business of the state-owned banks, and the policy business of the former state-owned specialized banks was divided out and was in the charge of several policy banks, such as China development bank(CDB), export-import bank of China(EIBC) and agricultural development bank of China(ADBC).

⁴⁹ Ding Fangwei. Strategic objectives, organizational structure and performance of state-owned banks [D]. Zhejiang Gongshang University, 2013.

CDB serves the national economy's major medium-and long-term development strategies mainly through financial services, such as medium-and long-term credit and investment. The main duties of EIBC are to implement the country's industry policies, foreign trade and economic cooperation policies, financial policies and diplomacy policies, so as to provide policy-related financial support for expanding the export of Chinese mechanical and electrical products, complete equipment sets and high- and-new-technology products, promoting the enterprises with comparative advantages to contract foreign projects and make foreign investment, and facilitating the development of foreign relations and international economic and trade cooperation. The main responsibilities of ADBC are to raise funds, undertake the policy-based agricultural financial business stipulated by the state, act as the agent for the allocation of financial funds to support agriculture, and provide services for the development of agriculture and rural economy in accordance with the laws, regulations, guidelines and policies of the state and on the basis of national credit.⁵⁰

The state-owned specialized banks specialize in commercial business and become wholly state-owned commercial banks. The business convergence of all banks is further expanded and the traditional division of responsibility is weakened. When the hat of specialized bank is removed, the market positioning of banks is becoming more homogeneous. The state-owned

⁵⁰ Yan Jiangqi. Research on the Marketization Path of China's Policy Banks [D] .Capital University of Economics and Business, 2013.

specialized banks have been reorganized to explore the road of reform, and the banking system of China has realized the transformation from a "unified" banking system to a system with four state-owned specialized banks as the main body. The phenomenon that "ICBC going to the countryside, ABC going to the city, BOC going ashore and the CCB going into the factory." gradually broadens the banking business. The share of the state-owned financial system in mobilizing and adjusting the allocation of economic resources has been increasing. The organization scale system of state-owned banks has also been greatly expanded, covering a larger scope of operation. Especially after the implementation of the "loan-to-appropriation" policy, the banks have almost managed the circulating funds of state-owned enterprises uniformly, and the credit funds of state-owned banks have gradually become the most important economic source for the development of state-owned economy (see Table 3-1).

Table 3-1 Expansion of the organizational scale of state-owned specialized banks

| Year | Personnel (10,000) | Organization (nr.) | Proportion of deposits (%) | Proportion of loans (%) | Non- state sector (%) | State sector (%) |
|------|-----------------------|-----------------------|-------------------------------|----------------------------|--------------------------------|------------------------|
| 1985 | 90.4 | 56741 | 83 | 92 | 17.06 | 82.40 |
| 1986 | 94.8 | 65479 | 80.5 | 90.3 | 18.94 | 81.06 |
| 1987 | 102.1 | 77862 | 78.2 | 87.2 | 20.16 | 79.84 |
| 1988 | 109.8 | 96563 | 75.4 | 85.8 | 20.53 | 79.47 |

| | | | | | | |
|------|-------|--------|------|------|-------|-------|
| 1989 | 118.9 | 95437 | 75.5 | 84.7 | 19.97 | 80.03 |
| 1990 | 126.9 | 11251 | 74.9 | 83.7 | 19.61 | 80.39 |
| 1991 | 131.5 | 120396 | 74.0 | 82.8 | 19.84 | 82.40 |
| 1992 | 142.7 | 123161 | 70.4 | 77.0 | 20.27 | 80.16 |
| 1993 | 156.3 | 135308 | | | 20.98 | 79.02 |
| 1994 | 164.5 | 147464 | | | 18.78 | 81.22 |

Sources: *Almanac of China's Finance and Banking* 1985-1994

In 1983, the State Council of China formally promulgated the *Decision on the People's Bank of China Specializing in the Functions of the Central Bank*, which established the position of the PBOC as the central bank from the legal level. PBOC became the central bank specializing in financial management, formulation and implementation of monetary policy, which terminated the era of conducting credit business for enterprises and individuals.

On November 10, 1986, Chen Muhua, member of the State Council and governor of the PBOC, wrote in *People's Daily* that the three major tasks of China's financial system reform in the next five years are to strengthen the functions of the central bank and establish a strong, flexible and free financial control and regulation system with macro-control; specialized banks and other financial institutions should be operated as enterprises step by step; develop and establish financial markets step by step. Since then, the direction of reform has been made clear, which indicates that the PBOC has begun to exercise its supervisory function, made directional adjustment

to the supervisory mode of the Bank, and begun to transform from a purely planned administrative means to a parallel use of administrative means and economic means; through the reform of fund management system, the mode of fund circulation between PBOC and the state-owned specialized banks will be changed from planned distribution to credit relationship; at the same time, the state-owned specialized banks shall be subject to credit examination, asset-liability ratio management, and other appraisal and administrative inspection. This kind of supervision mode based on "selecting the best and limiting the bad" not only frees the autonomy of banks at all levels, but also improves the efficiency of the use of loans, which is conducive to improving the enthusiasm of banks. The PBOC has relaxed restrictions on the cross-operation of specialized banks, and formulated policies and measures to encourage appropriate competition among banks, saying that "banks can choose enterprises, and enterprises can also choose banks". However, the supervision of the PBOC started mainly with the implementation of the credit plan and the macro-control ability and level, and supervision is realized mainly through administrative means and direct control, which does not play a significant role in rectifying the financial order and preventing and controlling financial risks. ⁵¹

Under the circumstance that the external environment and internal management system remained unchanged, the State implemented the reform

⁵¹ Cui Hongyan. Research on the Evolution of China's Financial Supervision System Thought Since the Founding of the PRC [D]. Fudan University, 2012.

of specialized banks as enterprises, promoted the independent operation of banks and makes them responsible for their own profits and losses, thus improving the enthusiasm of grassroots banks and stimulating the vitality of employees. Thus, during this period, despite the entrepreneurial reform of state-owned specialized banks were carried out, releasing certain financing rights and credit control rights, the state-owned specialized banks were still under the administrative management system, and the granting of credit to enterprises within the system must still be carried out in accordance with the credit plan issued by the State. The restoration and establishment of the four major state-owned specialized banks, including the establishment of branches, have not been carried out in accordance with the reform ideas of modern commercial banks, but continued to develop in accordance with the industrial management model and the system of administrative control of the planned economy period. ICBC, ABC, BOC and CCB maintain absolute monopoly positions in the four areas of circulating capital of industrial and commercial enterprises, rural areas, foreign exchange and capital construction. In order to make up for the decline in fiscal capacity, the State has exercised absolute control over the state-owned specialized banks through strong administrative means, replaced the weak state financial force in the process of gradual reform, and provided financial support for the production demand within the system, so as to ensure the normal operation of state-owned enterprises and the national economy. Therefore, finance is regarded as the financial capital of the central and local governments, and the financial industry is regarded as the "second finance", which plays many

financial functions such as tax substitution, financial subsidy and budget balance. Although the state-owned banks have developed rapidly and expanded rapidly in this stage, the basic function of financial regulation of resource allocation has not been brought into play because of too much restriction of system of administrative control and policy burden, showing the development characteristics of "high growth and low efficiency".

From the results, although the business of specialized banks has shown a stable and rapid development trend, the scale of assets has also expanded rapidly, the reform of specialized banks is mostly experimental measures, mainly dealing with policy-based business stipulated by the State, and has not fundamentally changed the operation mechanism. Therefore, with the deepening of the reform, the problems of state-owned specialized banks had become increasingly prominent, the asset situation was also deteriorating, and non-performing loans have soared, laying the groundwork for accelerating the commercialization of state-owned banks.

3.1.3 Successive establishment of joint-stock banks

3.1.3.1 Reorganization of Bank of Communications(BCM)

In order to realize the diversified development of equity structure and get rid of the monopoly of state-owned specialized banks, joint-stock banks have been established one after another. After the Third Session of the 12th Central Committee of the communist party of China put forward the "planned commodity economy" in 1984, the non-state-owned economy has also

developed rapidly. In the case that it is difficult for specialized banks to meet relevant financing needs, in 1986, the State Council issued the *Notice on the Reorganization of the Bank of Communications*, confirming that BCM is a joint-stock national comprehensive bank dominated by public ownership. From then on, the reform and development of joint-stock banks in China began. Notification requirements: First of all, BCM is a national comprehensive bank in parallel with other specialized banks, a joint-stock socialist financial enterprise dominated by public ownership, which, in accordance with the financial principles and policies of the State, raises and finances domestic and foreign funds and conducts various financial businesses in RMB and foreign currencies. Its business scope is not limited by the division of expertise. The total capital of BCM is tentatively set at RMB2 billion, and shares can be subscribed by the State, local governments, departments, enterprises and institutions and individuals. PBOC holds RMB one billion on behalf of the State. Individual shares shall be subject to appropriate restrictions. Each person shall subscribe for a maximum of RMB10,000, and the proportion of individual shares in the total capital shall not exceed 10 percent. Secondly, BCM may, according to the needs of economic development and business development, establish branches or representative offices at home and abroad after submitting applications for approval in accordance with the prescribed procedures. The General Administration Division of BCM shall implement the general manager responsibility system. Under the leadership of the General Administration Division, the branch offices shall operate independently, make independent

accounting and be responsible for their own profits and losses. According to the notice, the BCM may operate the following businesses: 1. absorb all kinds of RMB deposits and personal savings, foreign currency deposits and overseas Chinese deposits; 2. handle RMB circulating capital loans, discounts and fixed assets loans, as well as various foreign currency loans, overdrafts and discounts; 3. handle settlement and exchange at home and abroad; 4. issue RMB bonds and foreign currency bonds and other securities; 5. handle deposits, loans, loans and discounts between international and domestic banks; 6. trading in foreign exchange (including foreign currency) and trading in foreign currency stocks and securities; 7. invest in or jointly operate banks, finance companies or other enterprises in foreign countries and in Hong Kong and Macao; 8. organize and participate in international co-financing and syndicated loans; 9. undertake various international and domestic trust, insurance, investment, leasing, consulting, guaranty, safekeeping and agency business; 10. establish financial or non-financial subsidiaries; 11. operate the real estate business; 12. the manager issues all kinds of stocks and bonds and handles the transfer and trading of securities; 13. other businesses entrusted and approved by the PBOC; 14. approved to participate in international financial activities. It can be seen from the notice that the BCM takes deposits in the first place of business, and constantly enhances the strength of funds, which is the key to a stable development. BCM cannot rely on the PBOC to supply funds like before. It must rely on the absorption of deposits to continue to grow their own, explore, actively contact, and widely attract customers; it is necessary to carry out a series of

reforms on the existing business methods and constantly introduce new varieties in order to meet the needs of customers, win with new and win with excellence; we should start from the actual situation, absorb the advanced experience of foreign banks, and adopt the form of issuing large-denominated certificates of deposit, bonds, stocks, and so on, to open up new channels for raising funds; it is necessary to extensively open up trust, insurance, safe deposit boxes, and other financial services, and make every possible effort to extensively tap social funds. BCM lacks a fixed business object and a wide range of business outlets, However, unlike other specialized banks, BCM does not bear the necessary fund supply responsibilities for the current service scope of division of responsibility, and it does not have a heavy burden, which is also the advantage of BCM in a sense. Therefore, it is necessary to give play to the light-duty characteristics of BCM, and under the macro-control of the PBOC, seriously implement the national credit policy. We will continue to enrich our capital strength by adopting the method of combining deposit with releasing, deposit taking by releasing, and protecting releasing by deposit. At the same time, it is necessary to cooperate with enterprise groups to set up financial companies, establish business outlets with enterprises, and extensively develop contacts and cooperation with other financial institutions in order to make up for the shortcomings of the existing business outlets of BCM. Thirdly, BCM is an economic entity directly under the State Council at the bureau level, with a single independent account in the relevant departments in infrastructure, materials, labor wages, finance, personnel, foreign affairs,

science and technology, and telecommunications. All localities and departments should actively support the work of the BCM. From this we can see that BCM should take the support and promotion of horizontal economic integration as its main service direction. At the same time, it is necessary to actively support cross-regional economic cooperation and participate in the economic and financial activities of the economic union in terms of funds, promote horizontal economic cooperation and development, take the initiative to undertake the tasks assigned by the PBOC to develop the financial market, carry out cross-departmental and cross-regional fund-raising, adopt an open policy, break the blockade, communicate with each other, and do more work. Fourthly, BCM's labor target for 1986 is tentatively set at 500 employees. In the future, depending on the establishment of branches, the Bank will work out an increase plan. The BCM shall be exempted from income tax for three years from its opening. Therefore, according to the needs of the modern development of financial services, the BCM should put the cultivation of financial talents on an important agenda, pay special attention to strengthening the training and improvement of staff and workers, and take measures to encourage staff and workers to study hard in business, so that they can constantly increase their abilities in practice.⁵²

3.1.3.2 Establishment of joint-stock commercial banks

From the late 1980s to the mid-1990s, China has set off a wave of the

⁵² Yi Mianyang, Yao Huiyuan. Summarization of Chinese Modern Bank History Research Since 1980 [J]. Research of Modern History, 2005 (03): 252-282.

construction of joint-stock banks. With the continuous growth of the economic benefits, the banking system has also begun to actively explore to break the monopoly of state-owned specialized banks. A number of small-scale new commercial banks have been set up by means of guidance from outside the system, and joint-stock commercial banks, urban credit cooperatives and other financial institutions have gradually grown and become an important force in the banking financial system that cannot be ignored.

On April 8, 1987, CMB, the first experimental bank in China to promote banking industry reform from outside the system, was established in Shekou, Shenzhen, the forefront of China's reform and opening up. It was the first joint-stock commercial bank in China wholly owned by business entity, with an exclusive investment by China Merchants Group Shipping Co., Ltd. and a registered capital of RMB100 million.⁵³ CMB may, with the approval of the PBOC, engage in RMB deposits and foreign exchange deposits of individual clients, provide unit call deposits to enterprises and institutions in addition to business of RMB deposits and foreign exchange deposits, and establish a "computer savings card" business. Since then, after two times of capital and stock increase in 1989 and 1994, CMB has evolved from a sole proprietorship of China Merchants Group to a standard joint-stock commercial bank, gradually getting rid of the restrictions of regional

⁵³ Editorial Department. China Merchants Bank: From "zero" to "retail is king" [J]. China Banking Industry, 2018 (02): 101-103.

commercial banks and moving from Shekou to Shenzhen and from Shenzhen to the whole country.

On January 17, 1989, the PBOC approved CMB to increase its capital and expand its shares for the first time, 95% of which were owned by transportation enterprises. At that time, six shareholders, such as COSCO and Guangzhou Maritime Transport Bureau, were newly absorbed. The paid-in capital increased from RMB100 million to RMB400 million, and the sole ownership of China Merchants Group was changed into the joint ownership of six shareholders, forming the organizational structure of joint-stock commercial banks with the nature of limited liability company.

Table 3-2 Changes of CMB's Equity in 1989

| Shareholder name | Share capital (RMB ten thousand) | Equity ratio |
|--|----------------------------------|--------------|
| China Merchants Group Shipping Co., Ltd. | 18000 | 45% |
| China Ocean Shipping (Group) Company | 10000 | 25% |
| Guangzhou Maritime Bureau of the Ministry of Transport | 4000 | 10% |
| Guangdong Provincial Highway Administration | 2000 | 5% |
| Shandong Transportation Department Material and Industry Co., Ltd. | 2000 | 5% |
| Nanghai East Corporation of CNOOC | 2000 | 5% |
| Qinhuangdao Port Authority | 2000 | 5% |

Sources: official website of CMB

From May 1989 to early 1993, CMB was in its infancy. During this period,

CMB carried out the first capital increase, stock expansion and stock system reform and since then, became a joint-stock commercial bank under the leadership of the Board of Directors, which was wholly owned by the business entity and established the joint-stock enterprise system in the history of the People's Republic of China.

According to the requirements of modern enterprise system, CMB has explored the development path of joint-stock commercial banks, clarified the relationship of property rights, and implemented the separation of real ownership and management rights. It has improved the organization and management system of "first-class legal person and multi-level operation", and established a management system based on the following concept: self-management, at one's own risk, responsibility for one's own profit and loss, self-balance, self-restraint and self-development of the operating mechanism to realize the profit maximization and completely market-oriented behavior.

3.1.3.3 Establishment of urban credit cooperatives

In the late 1970s, with the gradual development of China's economic system reform, a small number of urban credit cooperatives appeared in some regions. China's first urban credit cooperatives were established in 1979 in Zhumadian, Henan Province. Before 1986, there were about 1,300 urban credit cooperatives with total assets of about RMB3 billion. In January 1986, the State Council issued the *Provisional Regulations of the People's*

Republic of China on the Administration of Banks, which clarified the status of urban credit cooperatives. In June of the same year, the PBOC issued the *Provisional Regulations on the Administration of Urban Credit Cooperatives*, which stipulated the nature, scope of service and conditions for the establishment of urban credit cooperatives. Since the mid-1980s, the establishment of urban credit cooperatives has accelerated, mainly in large and medium-sized cities above the prefecture level, but some places have also established urban credit cooperatives in counties (cities). With the large-scale establishment of urban credit cooperatives throughout the country, in order to strengthen management, the PBOC promulgated the *Regulations on the Administration of Urban Credit Cooperatives* in August 1988, which improved the conditions for the establishment of urban credit cooperatives and raised the registered capital from RMB100,000 to RMB500,000. By the end of 1989, the number of urban credit cooperatives had reached 3,330, with a total asset of RMB28.4 billion.

Taking the urban credit cooperatives in Shanghai as an example, in 1986, there were four urban credit cooperatives in Shanghai, which are, Chuan'nan, Zizhong, Beizhan and Yuyuan Urban Credit Cooperatives. The four urban credit cooperatives are all collective financial organizations that raise funds from the society through stock raising, independent management, independent accounting, self-financing and democratic management, with the paid-in capital of RMB434,000, including RMB100,000 for both the Chuan'nan and Zizhong Urban Credit Cooperatives, RMB114,000 for the

Beizhan Urban Credit Cooperative and RMB120,000 for the Yuyuan Urban Credit Cooperative. By source of share capital: collective enterprises account for 60%, self-employed 22%, urban residents 17% and credit cooperatives staff 1%. The urban credit cooperatives shall establish a board of directors and a board of supervisors to lead and manage the business of the whole cooperatives. The board of directors shall be composed of five to eleven persons and the board of supervisors shall be composed of three to five persons. Bank retirees account for 59% of the current workforce. The main objects of the service are collective enterprises and institutions of sub-district office, individual business, customers from other provinces and cities to Shanghai and urban residents. At present, the main business are the deposit, loan, and settlement business of the collective enterprises and institutions and individual business of the sub-district office, as well as the deposit and exchange business and cash generation custody of the non-local operating units and individual business in Shanghai. The four urban credit cooperatives have opened more than 500 accounts, absorbed more than RMB8 million in deposits of various types, issued more than RMB7.5 million in loans, with a loan balance of more than RMB4.7 million, raised RMB2.3 million in mutual financing with other financial institutions, and transferred RMB3.3 million in ICBC deposits (including deposit reserve funds).

However, some urban credit cooperatives are not standardized in management, low in the operating level, high in the proportion of non-

performing assets and poor in the ability to resist risks, forming a considerable financial risk. For example, in 1998, a depositor run event happened to Taizhou Luqiao Tailong Urban Credit Cooperative. Depositors' doubts about the bank's credit and reputation, coupled with a crisis of confidence triggered by the bank's General Manager's assistance in investigating corruption among local government officials, leading to a concentrated withdrawal of savings deposits from the bank's operating institutions from September 13 to 30, and the total withdrawal reached RMB372 million. With the help of government co-ordination and interbank borrowing, depositors' deposits were barely paid off.⁵⁴

In October 1998, the General Office of the State Council transmitted the *Work Plan for Rectifying Urban Credit Cooperatives* (hereinafter referred to as the *Rectification Plan*) of PBOC in order to effectively guard against and defuse financial risks, maintain social stability, and ensure the sound operation and healthy development of urban credit cooperatives.

The rectification work is mainly carried out from three aspects. The first part is asset verification. Under the leadership of the local government, a planned national inventory of the assets, liabilities and owners' equity of urban credit cooperatives is required, with emphasis on the real risk assessment of all assets. The second part is to resolve the risk. In line with the principle of "the one who organizes is responsible for organizing the

⁵⁴ Gao Dongmin. Intervention and Disposal of Chinese Urban Credit Cooperatives from the International Experience: 1998-2002 [J]. *Financial Research*, 2004 (09): 77-85.

settlement", the disposal shall be conducted on the basis of asset verification. There are three disposal methods: First method is self-help. When the urban credit cooperatives have temporary liquidity payment difficulties, they can rectification and reform by collecting assets, recovering the arrears of shareholders, increasing capital and expanding shares, and dismantling the funds reasonably. Second method is mergers and acquisitions. When payment is difficult but the amount is not large, mergers and acquisitions may be carried out in accordance with commercial principles and creditors' rights may be transferred. Third method is administrative closure or bankruptcy according to law. When serious insolvency occurs and cannot be solved through the first two methods, liquidation may be carried out and administrative closure may be applied for. If administrative closure is not possible, the bank may apply for bankruptcy to the People's Court. The third part is the normative transformation. The purpose of this paper is to implement the financial and accounting systems of urban credit cooperatives with the nature of commercial banks in strict accordance with the relevant provisions of the banking industry, to guide the urban credit cooperatives to carry out joint-stock system reform, operate according to the mechanism of commercial banks, and transform them into urban commercial banks.

Joint-stock commercial banks have played a positive role in the reform and development of China's economy and finance during the period of economic transition, which not only promoted the diversification of bank's property right structure and served the development of local economy, but also

promoted the formation of bank's competitive market and improved the level of financial services. With the break of the "unified" banking system and the establishment of new financial organizations, the banking industry began to show a diversified development trend. With the deepening of reform and opening up, the emergence of different types of banking institutions has promoted the innovation of financial business and financial instruments, and the marketization of banking operation has gradually strengthened. Banks have sorted out the development ideas and established business consciousness through the reform of enterprise. At the same time, they have also sought beneficial exploration of optimizing services and products on the basis of innovation of organizational structure. Generally speaking, the financial innovation of this stage is mainly guided by the external environment and policies and the bank's business innovation is based on organizational innovation, but the bank's conscious innovation behavior is still relatively small.

3.2 Tortuous development of commercialization reform (1994-2002)

3.2.1 Establishment of policy banks

With the deepening of reform and opening up, the reform of the financial system has been underway in an orderly and tense way. China has gradually cast off the bondage of the planned economic system and formed an economic system with public ownership as the main body and a variety of

economic components coexisting, and the market mechanism has gradually played its fundamental role in the allocation of resources. In this special historical stage, the domestic and international situation has also undergone tremendous changes.

In 1993, the State Council issued *Decision of the State Council on Reform of the Financial System*, proposing to deepen the financial reform by building the four banks, namely, ICBC, ABC, BOC, CCB, into large state-owned commercial banks, separating the policy-related business from the four banks, and constituting the specialized bank especially in charge of undertaking policy-related business, namely, policy banks. The document became the main legal document for the preparation of policy banks. Since then, the four major banks, namely, ICBC, ABC, BOC, and CCB have been transformed from specialized banks to state-owned commercial banks, and no longer undertaken policy-related financial business.

Therefore, in order to supplement and perfect the market financing mechanism, induce and restrain the flow of commercial funds, and provide professional financial services, the first policy bank, China Development Bank (CDB), was established in Beijing on March 17, 1994, with a registered capital of RMB 50 billion, mainly undertaking domestic development-oriented and policy-oriented financial business. The mission of the CDB was to enhance the competitiveness of the country and improve the lives of its people. On the one hand, CDB was committed to supporting the development of national infrastructure, basic industries, pillar industries, high-tech

industries and the construction of major national projects, so as to ensure the smooth progress of key projects that have a bearing on the overall national economy and social development.

On the other hand, in response to problems that the government strived to solve such as urbanization, small- and medium-sized enterprises, agriculture, rural areas and farmers, county economy, education, health service facilities and environmental protection, CDB actively offered financial support, and promoted market construction through financing, concentrated the national investment funds that were decentralized at the time, established an investment loan review system, gave development banks certain decision-making power of investment and loan, and required them to undertake corresponding responsibilities and risks, so as to prevent blind investment, duplicate construction, and promote comprehensive, balanced and sustainable development of the economy and society. In order to accomplish this mission, the CDB should strictly conform to the market principles and methods while carrying out the policy objectives of the government.

On July 1 of the same year, the Export-Import Bank of China (EIBC) was established in Beijing with a registered capital of RMB 3.3 billion, mainly to finance the import and export of large-scale mechanical and electrical equipment. The main duties of EIBC were to implement the country's industry policies, foreign trade and economic cooperation policies, financial policies and diplomacy policies, so as to provide policy-related financial support for expanding the export of Chinese mechanical and electrical

products, complete equipment and high-and-new-technology products, promoting the enterprises with comparative advantages to contract foreign projects and make foreign investment, and facilitating the development of foreign relations and international economic and trade cooperation. The main business scope included handling export credit and import credit; managing overseas contracted projects and overseas investment loans; handling preferential loans from the Chinese government to foreign countries; providing external guarantee; transferring loans from foreign governments and financial institutions; dealing with the international and domestic settlement business and enterprise deposit business under the loan of the bank; raising funds in domestic and foreign capital markets and money markets; handling international inter-bank loans, organizing or participating in international and domestic syndicated loans; engaging in Renminbi interbank borrowing and bond repurchase; engaging in proprietary foreign exchange transactions and approved foreign exchange transactions on behalf of clients; conducting credit investigation, consultation, evaluation and witness related to the bank's business; other approved or entrusted business. The EIBC was an important force in China's foreign trade and economic support system and an important part of the financial system. It is the main channel of policy-oriented financing for the export of mechanical and electrical products, complete sets of equipment and high-tech products, contracting projects abroad and all kinds of overseas investment. And as the main on-lending bank of foreign government loans and the lender of preferential loans granted by the Chinese government to foreign countries,

it played an increasingly important role in promoting the development of China's open economy.

On November 8 of the same year, the Agricultural Development Bank of China (ADBC) was established in Beijing with a registered capital of RMB 20 billion, mainly for agricultural policy support. ADBC was the only agricultural policy bank in China directly under the leadership of the State Council. It was established in November 1994 in accordance with *the Circular on the Establishment of the Agricultural Development Bank of China* issued by the State Council of the People's Republic of China on April 19, 1994 (GF 199425). The main responsibilities were to raise funds, undertake the policy-based agricultural financial business stipulated by the state, act as the agent for the allocation of financial funds to support agriculture, and provide service for the development of agriculture and rural economy in accordance with the laws, regulations, guidelines and policies of the state and on the basis of national credit. ADBC was under the guidance and supervision of the People's Bank of China (PBOC) and the China Banking Regulatory Commission. Since its establishment, according to the basic requirements of modern banks, the bank strictly distinguished between policy business and commercial business, deepened structural reform, improved the operating mechanism, strengthened internal control construction, strictly controlled credit risks, reduced operating costs, improved operating efficiency, implemented the talent strategy, and comprehensively implemented the national grain and cotton purchase and

sale policy and relevant economic and financial policies, and it played an important role in macro-control, ensuring national food security, protecting the interests of a vast number of farmers, and promoting the development of agriculture and rural economy.

The main reasons for the establishment of the three policy banks: first, the financing objects of policy banks were usually confined to the banks or projects, needed for the social development, without commercial financial institutions ready to provide funds, so that the policy banks can complement the defect of commercial financing and improve the financial system; second, the policy banks can instruct the commercial financial institutions with clear orientation and support emphasis of the State's economic policies through the pioneering investment behaviors, thus eradicating their hesitation and facilitating the participation of commercial funds; third, the policy banks can partly make up the deficiency of some project investment with low and no guarantee of profits through providing low-interest or interest-subsidized loan, thus attracting the participation of commercial funds; fourth, the policy banks can solve the bottleneck in economic development or open up new markets by making investment in infrastructural or emerging industries, thus promoting the follow-up investment by commercial funds; finally, policy banks generally provide financial services for specific industries or fields. They were highly professional, accumulated rich practical experience and professional skills, and gathered numerous skilled technical personnel, thus they can provide professional financial services in these fields.

The policy bank was different from the central bank and other commercial banks. Its important role was to make up for the defects of commercial banks in the allocation of funds, so as to improve and optimize the overall function of a country's financial system. Compared with other banks, first of all, from the nature of capital, policy banks were generally set up by government financial appropriation or government equity, controlled by the government, and maintained a close relationship with the government. Second, from the point of view of business purpose, the policy banks did not take profit as the goal, but carried out the national socio-economic policies as their own responsibility.

Policy banks' main function was to provide financing for national key construction and the development of industries and regions supported by national industrial policies. It generally included loans to support agricultural development, loans to purchase agricultural and sideline products, loans for infrastructure and basic industries such as transportation and energy, and loans for import and export trade. But not targeting profitability did not mean that policy banks are not profitable, or they ignored the beneficial result, but only in terms of business objectives, they did not pursue profit or maximize profits.

Third, in terms of business scope, policy banks cannot collect demand deposits and public deposits. The main sources of funds were the capital provided by the government, various borrowed funds and funds raised by issuing policy-related financial bonds, and most of the funds were used for

long-term loans and capital loans. Deposits earned by policy banks are not used for transfer, and loans were generally earmarked for special purposes and would not be converted directly into savings deposits and fixed deposits. Therefore, it would not have the functions of deposit and credit creation as commercial banks do. Policy banks had their own specific service areas and did not compete with commercial banks. They generally served those project areas which were of great significance to national economic development and social stability, and had large investment scale, long investment cycle, low economic efficiency and slow capital recovery, such as agricultural development, important infrastructure construction, import and export trade, small and medium-sized enterprises, economic and technological development and so on.

Fourth, from the view of financing principles, policy banks had their own special financing principles. In terms of financing terms or qualifications, which required that the object of financing must be someone getting financing funds that were not readily available from other financial institutions, only then it had qualifications to obtain funds from the policy bank, and all the funds provided were medium and long-term credit, the loan interest rate was obviously lower than the commercial bank similar loan interest rate in the same period, some even lower than the financing cost, but it requested to repay the principal and the interest on time.

Fifth, from the credit creation ability, policy banks generally did not participate in the credit creation process, and its derivative ability of funds

was weak. Because the source of funds of policy banks was not mainly deposit taking, often provided by the government, and the loan of policy banks were mainly earmarked funds, thus it would not increase the money supply under normal circumstances.

3.2.2 Establish laws in the banking industry and strengthen financial supervision

Under the background of financial institutions becoming enterprises, financial products becoming diversified and financial operation becoming computerized, China's commercial bank adopted a more positive attitude toward financial innovation. The rapid spread of information technology-based platform construction provided a strong support for improving the efficiency of management system and promoting financial innovation. The banking industry began to think deeply whether the products provided met the actual needs of the micro-market, and launched a large number of market surveys and attempts. Due to the lack of financial market principle constraints and financial innovation theory guidance, some of the financial innovation activities in this period were blind. Financial innovation not only provided more impetus and space for the development of the banking industry, and broadened the scope of business, but also generated a large number of risks, forming both positive and negative experience. At this stage, the banking regulatory authorities had also made major adjustments to the existing regulatory system, however, in the past, they took the scale of assets and the flow of funds as the main supervision objects. After a series of

financial risk events, the CPC Central Committee began to realize the necessity of rectifying the financial order and preventing financial risks, thus it transferred the core direction of supervision to risk supervision, gradually abolishing the limit of the loan scale of state-owned banks, and comprehensively implementing asset liability management and risk management. On this basis, the regulatory authorities began a comprehensive inspection of all types of financial institutions throughout the country, carried out a large-scale inspection on the asset quality, profitability, internal control and operating compliance of financial institutions, cleaned up and rectified a large number of illegal financial institutions through capital injection, acquisition, bankruptcy, dismissal, etc., and established a comprehensive legal system covering all aspects of bank management, for example, *the Law of the People's Republic of China on the People's Bank of China* and the *Law of the People's Republic of China on Commercial Banks*. They also promulgated a series of stricter and more specific access regulation systems in terms of market access and management of senior managers' qualifications, which embodied the determination of the Party and the government to standardize their operation by market-oriented means. In 1998, the GITIC declared bankruptcy due to insolvency through the decision of the Guangdong Higher People's Court. Since the central bank has cleaned up and rectified illegal financial institutions such as trust industry, urban credit cooperatives and rural credit cooperatives in 1998, many small- and medium-sized financial institutions have withdrawn from the market. In 1998, Hainan Development Bank was

closed down by the central bank because of its serious insolvency and huge financial risks accumulated. The fifth rectification of the trust industry, which began in 1998, was basically completed by 2003. Before the rectification, only about 60 of the 239 trust and investment companies were retained and re-registered.

3.2.3 Transformation of national specialized banks into state-owned commercial banks

In the initial stage of the planned market-oriented reform, the state-owned banking system achieved the first transformation, forming a state-owned specialized banking system, providing effective financial support for the smooth transition of the economy. With the deepening of market-oriented reforms and hardness of budget constraint on micro-economic entities, banks and state budgets, the drawbacks of the state-owned specialized banking system were also increasingly exposed. In addition, in order to ensure the smooth completion of the economic transition and the smooth operation of the national economy, the state-owned specialized banks also bore excessive policy burdens and paid a huge price, such as large non-performing loan balance, low capital adequacy ratio, and low economic performance.

Before 2002, the statistics and estimation of the non-performing loan ratio of state-owned banks were incomplete and the standards were not uniform. At that time, according to the General Rule of Loan formulated by PBOC and the financial accounting system of financial enterprises of the Ministry

of Finance of the PRC, the loans were divided into four categories: normal, overdue, sluggish and bad loans. The latter three categories were known collectively as non-performing loans, which were called "one overdue-two slacks" at that time with greater flexibility in identification and operation and lacked relatively accurate figures on the amount of non-performing loans. The reasons of statistics, classification standard and cognition made the society have great differences in the view of the amount of non-performing loans. Still, by and large, the non-performing loan ratios of the big four state-owned banks were able to collate a number that reflected the changing context. 12 % at the end of 1990; 21.4 % at the end of 1995. Therefore, in order to improve the operation of state-owned specialized banks, a two-step approach to the commercialization of state-owned specialized banks has been adopted since 1994.

Step 1: from 1994 to 1997, the state-owned specialized banks should be transformed into solely state-owned banks, and the separation of policy-oriented finance from commercial finance may be realized in order to lighten their policy-oriented burden. The state-owned banks should be transformed into independent commercial entities with independent civil capacity and corresponding civil obligations. The first is to strengthen macro-control in the financial sector. Regulate the total money supply by strictly managing the ratio of assets and liabilities, strictly controlling the loan of fixed assets, and swallowing the base money by economic means. The second is to strengthen financial regulation. Emphasis should be placed on clearing up

financial institutions that violate the law or exceed their powers of examination and approval, strictly defining the business scope of each major financial institution, and strengthening the supervision and regulation of social fund-raising. The third is to separate policy finance from commercial finance. Carry out macro benefits and resource allocation through the establishment of three policy banks such as CDB, EIBC, and ADBC. The three measures achieved good results. In 1994, about RMB 600 billion of new savings deposits were added, and the exchange rate of the US dollar stabilized at the price level of RMB 8.7. The CDB issued RMB 75.8 billion in financial bonds and RMB 81.8 billion in loans, with a capital availability rate of nearly 100%.

Step 2: from 1997 to 2002, the focus of the reform was to reduce the risk of wholly state-owned banks. The state-owned specialized banks paid a huge reform cost for the smooth completion of the economic transition and the operation of the national economy. As state-owned specialized banks took on too much policy burden and simply met the funding needs of domestic enterprises for development, and some did not even conduct market research on capital risks, so they gradually exposed a large number of non-performing loans, and the risks increased gradually.

Table 3-3 Capital Scale of State-owned Banks, 1998-2002

| | 1998 | 1999 | 2000 | 2001 | 2002 |
|--------------------|---------|---------|---------|---------|-----------|
| I. Deposits | 69782.2 | 79973.5 | 90892.7 | 97346.9 | 113452.28 |

| | | | | | |
|--|---------|----------|----------|----------|-----------|
| 1. Enterprise deposits | 25249.1 | 28733.1 | 33337.6 | 33081.3 | 35980.06 |
| (1) Current deposit | 19146.1 | 21810.4 | 25585.4 | 25192.8 | 27546.94 |
| (2) Fixed deposit | 6103.0 | 6922.7 | 7752.2 | 7888.5 | 8433.12 |
| 2. Fiscal deposit | 2169.6 | 2106.3 | 3477.3 | 3330.6 | 3447.90 |
| 3. Deposits of institutions | 1215.6 | 1720.3 | 2079.4 | 2493.6 | 4610.00 |
| 4. Urban savings deposits | 39561.0 | 44828.0 | 48626.8 | 54306.9 | 64024.46 |
| (1) Current deposit | 8722.2 | 11225.3 | 14043.9 | 16626.6 | 20893.90 |
| (2) Fixed deposit | 30838.8 | 33602.7 | 34583.0 | 37680.2 | 43130.56 |
| 5. Agricultural deposits | 300.6 | 342.1 | 372.0 | 409.7 | 465.72 |
| 6. Other types of deposits | 1286.3 | 2243.7 | 2999.6 | 3724.8 | 4924.14 |
| II. Financial bonds | 1.7 | 1.4 | 1.0 | 0.8 | 0.47 |
| III. Inter-bank transactions | 2706.0 | 3137.8 | 6141.0 | 5870.9 | 5055.76 |
| IV. Cash in circulation | 11204.2 | 13455.5 | 14652.7 | 15688.8 | 17278.03 |
| V. Liabilities to international financial institutions | 174.4 | 371.9 | 368.3 | 484.5 | 423.05 |
| VI. Miscellaneous | 6997.3 | 4228.9 | -1927.1 | -967.7 | 963.86 |
| Total funding sources | 90865.8 | 101169.0 | 110128.6 | 118424.2 | 137173.46 |
| I. Deposits | 68442.1 | 73695.8 | 76393.8 | 80077.6 | 90892.63 |
| 1. Short-term loan | 48105.7 | 50113.2 | 49242.1 | 43679.8 | 45800.67 |
| (1) Industrial | 16664.1 | 16786.5 | 15657.7 | 15763.2 | 16745.38 |

| | | | | | |
|---|---------|---------|---------|---------|----------|
| loan | | | | | |
| (2) Commercial loan | 18746.7 | 18989.5 | 16958.5 | 16463.5 | 15760.12 |
| (3) Construction loan | 1512.4 | 1322.8 | 1425.6 | 1684.8 | 2168.03 |
| (4) Agricultural loan | 1781.6 | 1744.6 | 1289.4 | 1272.3 | 1286.04 |
| (5) Loan to township enterprises | 1754.9 | 1905.4 | 1415.3 | 1450.5 | 1542.61 |
| (6) Loan to foreign-funded enterprises | 2226.9 | 2675.5 | 2678.3 | 2392.2 | 1723.46 |
| (7) Loan to private enterprises and individuals | 208.3 | 301.0 | 354.4 | 425.9 | 392.42 |
| (8) Other short-term loans | 5210.8 | 6387.9 | 9462.9 | 4227.4 | 6182.61 |
| 2. Medium and long term loan | 19744.3 | 22791.7 | 26406.1 | 34995.7 | 42317.21 |
| 3. Other types of loans | 592.1 | 790.9 | 745.6 | 1402.1 | 2774.75 |
| II. Portfolio and investment | 6037.6 | 9675.0 | 16419.4 | 16913.4 | 19488.39 |
| III. Inter-bank transactions | 669.6 | 928.1 | 941.6 | 1153.7 | 1060.85 |
| IV. Funds outstanding for gold and silver | 12.0 | 12.0 | 12.0 | 256.0 | 337.24 |
| V. Funds outstanding for foreign exchange | 13660.6 | 14671.9 | 14203.5 | 17687.3 | 23014.07 |
| VI. Financial loan | 1582.1 | 1582.1 | 1582.1 | 1582.1 | 1582.06 |

| | | | | | |
|---|---------|----------|----------|----------|-----------|
| VII. Assets at international financial institutions | 461.8 | 604.1 | 576.3 | 754.2 | 798.22 |
| Total use of funds | 90865.8 | 101169.0 | 110128.6 | 118424.2 | 137173.46 |

Sources: *Almanac of China's Finance and Banking* 1998-2002

With the outbreak of the Asian financial crisis in 1997, a large number of enterprises were affected by the financial crisis, resulting in operating losses and even incapability to repay bank loans. The domestic financial market was also hit hard, and the non-performing loan crisis accumulated by state-owned banks for a long time was gradually exposed, which also made the risks faced by state-owned banks more prominent. From 1998 to 2002, the state adopted a series of reform measures to reduce the risk of state-owned banks, replenish the capital for state-owned commercial banks and strip off non-performing loans. In January 1998, the Ministry of Finance first issued RMB 270 billion in special bonds to inject capital into the four banks, including ICBC of RMB 85 billion, ABC of RMB93.3 billion, BOC of RMB42.5 billion, and CBC of RMB49.2 billion. After completion in June, the capital adequacy ratios of the banks reached the standard.⁵⁵

Then four newly established financial asset management companies (AMC), including Huarong and Orient, launched large-scale non-performing loan receipts, stripping state-owned commercial banks of RMB 2.69 trillion of

⁵⁵ Shi Huaqiang. Non-performing loans, adjustment factors and severity of state-owned commercial banks: 1994-2004 [J]. *Financial Research*, 2005 (12): 25-39.

non-performing loans accumulatively. At that time, the policy of the state for the four AMC was: first, the loss of asset disposal was covered by finance; second, the capital source of the AMC was the capital allocated by the government (except for the Orient Asset, which was allocated by the Ministry of Finance of RMB 6 billion and USD 500 million, the other three companies were allocated RMB 10 billion), and the re-loans and financial bonds issued by the central bank to the state-owned banks were allocated; third, tax reduction and exemption; fourth, the four AMCs were endowed with some means of asset disposal. They mainly consisted of: recovering debts, leasing or otherwise transferring or reorganizing assets formed by non-performing loans, transferring debts to equity, recommending listings of companies within the scope of asset management, and underwriting bond stocks, issuing financial bonds and borrowing from financial institutions, finance and law consulting, asset and project evaluation, applying for refinancing from the PBOC, and restructuring and disposing of assets owned by the company. In addition, the state optimized the law enforcement environment for the disposal of non-performing assets in banks, and the Ministry of Finance agreed in 2001 to use 1-1.2% of the recovered cash as an incentive fund for the four major AMCs.

In 1995, the Third Session of the National People's Congress passed the *Law of the People's Republic of China on Commercial Banks*, which has formally provided legal protection for the commercialization of banks. By the end of 2002, China formed a huge banking system consisting of the PBOC as the

central bank, four wholly state-owned commercial banks as the main body, three policy-oriented commercial banks, 10 joint-stock commercial banks, 111 urban commercial banks, 523 urban credit cooperatives, 38,153 rural credit cooperatives and 158 foreign-funded commercial banks⁵⁶. Also, according to the data released by *The Banker* in July 2002, 15 commercial banks had ranked among global top 1000. Among these banks, the five major Chinese commercial banks had been listed in global top 100. It indicates that China has built a modern commercial bank system.

However, this stage of reform improved the quality of assets and capital adequacy ratio of banks to a certain extent and the ability of state-owned banks to resist risks, but it did not fundamentally solve the soft budget constraints of state-owned banks caused by the policy burden. In 2000 and 2001, the non-performing loan ratio of state-owned banks reached 55.11% and 49.29% respectively after excluding the policy divestiture factor. The non-performing assets of state-owned banks have exceeded their own capital and are in the state of "technical bankruptcy" in essence. So far, the reform of state-owned commercial banks has fallen into a dilemma.

3.2.4 Rapid development of joint-stock banks

The joint-stock commercial bank was in the initial stage of establishment from 1989 to 1993, and entered the stage of rapid development from 1994 to 2002. After the 14th National Congress of the Communist Party of China in

⁵⁶ Zhang Jie. Financial Support in Progressive Reform [J]. *Economic Research*, 1998 (10): 52-57.

1992, the construction of economic system and legal system was strengthened, and the *Law of the People's Republic of China on the People's Bank of China and the Law of the People's Republic of China on Commercial Banks* were promulgated successively, which provided the legal guarantee for the independent operation, self-risk and self-profit and loss of the commercial banks. In 1994, CMB carried on the stock system reorganization, and set off the joint-stock commercial bank's rapid development tide. The initiators were eight business entities: China Merchants Group Shipping Co., Ltd., China Ocean Shipping (Group) Company, Guangzhou Maritime Transport (Group) Co., Ltd., Nanhai East Corporation of CNOOC, Guangdong Highway Administration, Shandong Traffic Development and Investment Company, Qinhuangdao Port Co., Ltd. and Shenzhen Shekou Merchants Bank Investment Service Company. Although CMB was originally the exclusive shareholder of China Merchants Group, it still took the lead in meeting international practice to form the board of directors, and implemented the president responsibility system under the leadership of the board of directors, with Yuan Geng as the chairman and Wang Shizhen as the first president. The separation of the two powers made CMB more professional, independent and free in management, which laid the management foundation for CMB in the subsequent remarkable achievements. The Asian financial crisis in 1997 did not affect the progress of joint-stock commercial banks, but became a good opportunity to strengthen corporate governance and improve internal management.

The good development of joint-stock commercial banks was mainly reflected in the following three aspects: First, the operating performance was good. The scale of assets increased substantially. In 1997 and 2002, the assets of joint-stock commercial banks were RMB 751.16 billion and RMB 2,245.41 billion respectively, and the proportion of banking financial institutions also increased from 4.8% to 9.5%. In terms of profit level, the total net profit of joint-stock commercial banks reached RMB 8.921 billion in 2003, accounting for more than 25%. In terms of asset quality, the balance of non-performing loans of joint-stock commercial banks was RMB 187.7 billion, and the non-performing loan ratio was 7.92%, compared with 17.8% of the total non-performing loans of China's banking sector during the same period.

Second, the speed of financial product innovation accelerated and the degree of informatization was high. Compared with large state-owned banks, joint-stock commercial banks were small in scale, flexible in system and strong in innovation. They not only diversified their business structure and products in traditional businesses such as deposits, loans and remittances, but also developed rapidly in emerging areas such as bank cards, financial services and credit card payments. The rapid development of joint-stock commercial banks was inseparable from their emphasis on the construction of financial system informatization. In this stage, the main joint-stock commercial banks basically realized the informatization of management supporting system.

Third, the corporate governance was strengthened and the business

management system was improved. Under the supervision and support of the People's Bank of China (PBOC), the joint-stock commercial banks devoted a lot of energy to standardizing the corporate governance structure, improving the effectiveness and professionalism of internal management by revising the articles of association, perfecting the organizational structure, adding professional committees and introducing external independent directors and supervisors. At the same time, the joint-stock commercial banks began to actively seek listing. During 1999-2003, four joint-stock banks were listed on the Shanghai Stock Exchange, which accepted supervision from all sectors of society, enhanced the quality of capital and improved the level of operation and management.

Table 3-4 1999-2003 Joint-stock Commercial Banks Listing

| | Listing date | Issuing amount (10 ⁸) | Issuing price (RMB) | Opening price on the first day (RMB) | Total number of shareholders in June 2019 (10 ⁴) | Capital stock at June 30, 2019 |
|----------------------------------|--------------|-----------------------------------|---------------------|--------------------------------------|--|---|
| Shanghai Pudong Development Bank | 1999/11/10 | 4 | 10.00 | 29.50 | 17.47 | The accumulative holdings of the top ten circulating shareholders: 21.207 billion shares, the accumulative proportion of circulating share: 75.45% |
| China Minsheng Bank | 2000/12/19 | 3.5 | 11.80 | 20.00 | 39.53 | The top ten circulating shareholders accumulatively held A and H circulating shares: 26.087 billion shares, the accumulative proportion of A and H circulating shares: 59.58% |
| China Merchants Bank | 2002/4/9 | 15 | 7.30 | 10.51 | 26.24 | The accumulative holdings of the top ten shareholders: 16.877 billion shares, accounting for a cumulative share of the total equity: 66.9% |
| Hua Xia Bank | 2003/9/12 | 10 | 5.60 | 7.48 | 12.13 | The accumulative holdings of the top ten circulating shareholders: 9.373 billion shares, the accumulative proportion of circulating share: 73.1% |

Data sources: Annual reports of Banks and Genius Finance. <http://www.genius.com.cn/geniusData.html> (1999-2003)

3.2.5 The emerging of urban commercial banks

In the first half of 1989, PBOC organized the clean-up and rectification of urban credit cooperatives in accordance with the spirit of central government rectification. During the clean-up and rectification period from 1990 to 1991, the local governments controlled the scale of the newly established institutions, disbanded and merged urban credit cooperatives with poorly management. During the 2 years, 253 new institutions were established and 75 institutions were abolished. By the end of 1991, there were more than 3,500 urban credit cooperatives with total assets of RMB 49.7 billion and more than 77,000 employees. In 1990, the pilot project of urban credit cooperatives was launched. In 1992, the clean-up and rectification was over, the economy of China entered a period of rapid development, and the demands of applying for urban credit cooperatives from all walks of life were very strong. During this period, the number of urban credit cooperatives expanded rapidly, and urban credit cooperatives were established in most counties (cities). By the end of 1993, the number of urban credit cooperatives was nearly 4,800, an increase of more than 1,200 over the end of 1991, with total assets of RMB 187.8 billion and 123,000 employees. Since the second half of 1993, PBOC has made great efforts to rectify the financial order. And, the head office also demanded all provincial branches to stop approving new urban credit cooperatives as of July 1, 1993, and to suspend the use of indicators that had been issued but not been used

up, while handling the problems of approving urban credit cooperatives beyond their powers and scale. After the implementation of this spirit, the overwhelming majority of places did not approve new urban credit cooperatives. Since 1995, some prefecture-level cities have established urban commercial banks on the basis of urban credit cooperatives in accordance with the instruction of the State Council. In March of the same year, PBOC issued *Circular on Further Strengthening the Administration of Urban Credit Cooperatives*, which clearly stated in document form: "No new urban credit cooperatives shall be approved in the process of establishing the national urban cooperative banks." After this circular was issued, the examination and approval of urban credit cooperatives were basically completely stopped throughout the country.⁵⁷

On the basis of urban credit cooperatives, urban cooperative banks began to be established. By the end of 1996, 18 cities had established cooperative banks and were open for business. In March 1998, the urban cooperative bank was renamed as the urban commercial bank, and began to change from cooperative system to joint-stock system. At the same time, in view of the fact that some urban credit cooperatives with non-standardized management, low operating level, high proportion of non-performing assets, and poor ability to resist risks, all these problems caused considerable financial risks. In October 1998, the General Office of the State Council transmitted the

⁵⁷ Huang Zhengwei. Research on the System Reform of Urban Credit Cooperatives and Urban Commercial Banks [J]. *China Finance*, 2000 (12): 21-23.

Work Plan for Rectifying Urban Credit Cooperatives of PBOC, to effectively prevent and defuse financial risks, maintain social stability, and ensure the sound operation and healthy development of urban credit cooperatives. The *Work Plan for Rectifying Urban Credit Cooperatives* required all local governments to conscientiously carry out the assets and capital verification of urban credit cooperatives under the unified leadership of the local government, thoroughly investigate the assets, liabilities and risks of urban credit cooperatives, and resolve the risks of urban credit cooperatives by self-rescue, acquisition or merger, administrative closure or bankruptcy according to law; to restructure or reform urban credit cooperatives and association in accordance with relevant documents; and to further strengthen the supervision of urban credit cooperatives throughout the country. By the end of 1999, nearly 2,300 urban credit cooperatives were involved in the establishment scale of 90 urban commercial banks in accordance with the requirements of Rectification Plan, except for the closure or suspension for internal rectification of a few urban credit cooperatives that operate in serious violation of laws and regulations, which laid a good foundation for the healthy development of urban credit cooperatives. In November 2005, China Banking Regulatory Commission, PBOC, the Ministry of Finance, and the State Taxation Administration jointly formulated and issued the *Opinions on Further Promoting the Rectification of Urban Credit Cooperatives*, proposing to effectively promote the rectification of urban credit cooperatives, and promoting the withdrawal of revoked and suspended urban credit cooperatives from the market. By the end of 2007, the head of China

Banking Regulatory Commission said that since 2006, the reform of urban credit cooperatives has made significant progress: 251 urban credit cooperatives had been effectively handled, and 230 urban credit cooperatives suspended for internal rectification had also completed the market withdrawal. On March 29, 2012, the last urban credit cooperative in China-Lvye Urban Credit Cooperative in Xiangshan Town, Ningbo City, reformed as the urban commercial bank, Ningbo Donghai Bank Co., Ltd. (referred to as Ningbo Donghai Bank). Since then, the urban credit cooperative officially withdrew from the historical stage

Urban commercial banks are formed under the special historical conditions of China. They are the products of the central financial authorities in rectifying urban credit cooperatives and resolving local financial risks. In 1995, the first urban commercial bank in China-Shenzhen Urban Cooperation Bank (now Ping An Bank) was established. The establishment of urban commercial banks has gradually changed the widespread problems of urban credit cooperatives such as decentralized operation, small capital scale, weak ability to resist risks and so on, and further strengthened the construction of the organizational system of commercial banks. However, in the early period of urban commercial banks, the risks and weaknesses accumulated in the past have not been fully exposed, resulting in the lack of management of some branches of commercial banks, and imbalanced development of various regions. As a special group, urban commercial banks have the following characteristics in scale and operation: First, small overall

scale. Due to its geographical constraints, the assets of urban commercial banks in China are generally small. Statistics showed that (by the end of 2003): There were 2 urban commercial banks with assets of more than RMB 100 billion; 2 with assets of between RMB 50 billion and RMB 100 billion; 14 with assets ranging from RMB 20 billion to RMB 50 billion; 19 with assets ranging from RMB 10 billion to RMB 20 billion; and 75 with assets below RMB 10 billion. Among them, the assets of the largest urban commercial bank were only RMB 193.4 billion; the smallest had assets of just RMB 911 million. Thus, most of the assets of China's urban commercial banks were less than RMB20 billion, and nearly 70% of them are less than RMB10 billion. Therefore, the urban commercial bank basically belongs to the category of small and medium-sized banks. Secondly, highly dependent development. Urban commercial banks with good performance are mainly concentrated in the more developed areas, especially in the eastern China. Its main performance is: The local government revenue is abundant, which has little negative influence on the urban commercial banks. The number of small and medium-sized private enterprises is large, and the profitability is strong. The urban commercial banks are willing to provide loans to small and medium-sized enterprises; High per capita income, developed credit culture; Local governments have a high awareness of protecting private property rights; etc. The development of economy is the soil of finance. Most of the urban commercial banks are located in more developed central cities, where the economy is active and facing the most valuable customers in the city. These advantages provide a good foundation for the business

development of urban commercial banks. Third, unclear market positioning. At the beginning of its establishment, the urban commercial bank had established the market orientation of "serving the local economy, the small and medium-sized enterprises and the urban residents" However, there are still a considerable number of urban commercial banks showing the vacillating market positioning. This is highlighted as follows: Many urban commercial banks are keen to compete with state-owned banks and joint-stock commercial banks for big customers and projects. There are many reasons for external financial environment and market conditions. But more importantly, the reason for urban commercial banks is crucial. The imperfect corporate governance, single business means and insufficient product innovation also restrict the survival and development of urban commercial banks. Throughout China's banking industry, now the urban commercial banks are trapped into unfavorable situations. Pessimistically, urban commercial banks are in a dilemma, because there are not only the monopolies of the four major state-owned banks and the competition of joint-stock banks, but also the competition of the rural credit cooperatives in the vigorous reform, and the penetration of foreign banks. Compared with large commercial banks, urban commercial banks have relatively low credit rating, weak ability to replenish capital, and higher interest rates for issuing subordinated debt than joint-stock banks and state-owned banks, which directly leads to its high financing cost. Therefore, the extensive development mode of urban commercial banks, which relied on capital consumption in the past, has become unsustainable. It is of great

significance to rectify the urban commercial banks for marketization of China's economy and financial industry. To a certain extent, it fills the market gap caused by the contraction of state-owned commercial banks, and satisfies the financing needs of small and medium-sized enterprises and residents. At the same time, the urban commercial banks have greatly enriched the financial services for urban and rural residents with its high-quality and convenient services, and the network covering the urban and rural areas. Urban commercial banks are the main financing channels for small and medium-sized enterprises and private enterprises in China, which have made great contributions to the economic development with the small and medium-sized enterprises and the citizens as their market positioning.

3.2.6 Reform of rural credit cooperatives

As early as the 1950s, the outlets of the People's Bank of China (PBOC) were changed to rural credit cooperatives in the rural areas. Rural credit cooperatives are cooperative financial organizations which are composed of farmers' shares, democratically managed by their members, and mainly serve them. They are formal financial institutions approved by PBOC in accordance with the law. The so-called bank financial institutions are also called deposit-taking institutions and deposit money banks. Their common characteristics are to take deposits as the main liabilities, to issue loans as the main assets, to handle transfer and settlement of accounts as the main intermediary business, and to directly participate in the creation of deposit money. Rural credit cooperatives are also credit cooperatives, which are

cooperative financial institutions with mutual-help as the main purpose, and are composed of individual fund-raising. The credit cooperatives carry out deposit and loan business among their members for mutual and self-help. The establishment of credit cooperatives is directly related to the development of the natural economy and the small commodity economy. As capital needs of agricultural producers and small commodity producers are seasonal, scattered, small amount and small-scale, it is difficult for small producers and farmers to get the bank loans. But objectively speaking, the development of production and circulation must solve the problem of capital shortage, so this mutual and self-help credit organization is formed by paying stock funds and deposits.⁵⁸

As banking financial institutions, rural credit cooperatives have their own characteristics, mainly as follows: Firstly, they are established by farmers and other individuals in the countryside with mutual-help as their main purpose. Their business is managed by designated personnel of the members on the basis of democratic elections, and responsible to the members. The congress of members is its supreme authority, and the council is the executive body responsible for the management of specific affairs. Secondly, their main sources of funds are the shares paid by the members of the cooperatives, the reserved accumulation fund and the absorbed deposits; The loan is mainly used to meet the funding needs of their members. At first,

⁵⁸ Lan Hong, Mu Zhengshe. A Panoramic Review, Evaluation and Thinking of the Reform of Rural Credit Cooperatives in China [J]. Shanghai Finance, 2012 (11): 17-29 + 116.

they mainly issued short-term production loans and consumer loans. Then, with the economic development, they have gradually broadened the lending channels, which is not different from commercial bank loans. Thirdly, since the business is conducted with members of cooperatives, the business procedures are simple and flexible. The main tasks of rural credit cooperatives are: in accordance with the provisions of national laws and financial policies, to organize and regulate rural funds, to support agricultural production and comprehensive rural development, to support various forms of cooperative economy and member family economies, and to restrict and combat usury.

In 1984, the State Council Document No. 105 transmitted *Report of Agricultural Bank of China on Reforming the Management System of Rural Credit Cooperatives*. It proposed that the rural credit cooperatives should be established as cooperative financial organizations, and their cooperative nature should be restored, that is, to restore their mass organization, democratic management and flexible operation. During this period, the rural credit cooperatives system reform was gradually deepened, and various business was developed rapidly. Since 1996, when the State Council decided to decouple the rural credit cooperatives from the Agricultural Bank of China, the rural credit cooperatives have begun to operate through cooperation. In August 1996, the State Council issued the *Decision of the State Council on the Reform of Rural Financial System*, stressing that the focus of the reform is to reform the management system of rural credit

cooperatives and transform them into real cooperative financial organizations. After the reform, the governance model of rural credit cooperatives has undergone fundamental changes, the long-standing problem of insider control has been effectively solved, and the organizations themselves have formed an endogenous driving force to further promote the reform of institutional mechanisms.

3.3 Dividend Release Phase in Joint-stock Reform (2003-2013)

3.3.1 Joint-stock reform and listing of China's four major banks

After 2003, with the further market-oriented reform, China entered another period of rapid economic growth, with GDP growth in double digits in most years, relaxed market environment, sufficient liquidity and high M2 growth rate. After the financial crisis broke out in 2008, China launched a 4 trillion RMB economic stimulus plan, by which commercial banks were not negatively affected, but seized the opportunity. The favorable domestic macroeconomic conditions provided a good external environment for the rapid development of commercial banks, realizing the rapid expansion of assets and profits. During this stage, China's banking industry achieved rapid development. Its capital quality, non-performing loan ratio, liquidity ratio, profitability and other indicators continued to improve, and gradually narrowed the gap with the world's first-class banks, or even caught up with the advanced international banks. These good performances were the result

of the dividend release.

Table 3-5 Capital Utilization of the Four Major Banks in 2003-2005 (Unit: Billion RMB)

| Item | 2003 | 2004 | 2005 | Growth Rate |
|--------------------------------|-----------|-----------|-----------|-------------|
| Net Foreign Assets | 3773.29 | 5534.89 | 7559.59 | 100.34% |
| Domestic Credits | 20628.36 | 22526.18 | 24836.71 | 20.40% |
| Claims on Government (Net) | 1317.85 | 1549.57 | 1519.73 | 15.32% |
| Claims on Non-financial Sector | 17270.02 | 19298.34 | 20950.29 | 21.31% |
| Claims on Other Sectors | 2040.49 | 1678.28 | 2366.69 | 15.99% |
| Currency and Quasi-money | 22122.28 | 25410.70 | 29875.57 | 35.05% |
| Currency | 8411.86 | 9596.97 | 10727.88 | 27.53% |
| Cash in Circulation | 1974.60 | 2146.83 | 2403.17 | 21.70% |
| Current Deposits | 6437.26 | 7450.14 | 8324.71 | 29.32% |
| Quasi-money | 13710.43 | 15813.72 | 19147.69 | 39.66% |
| Fixed Deposits | 2094.04 | 2538.22 | 3310.00 | 58.07% |
| Savings Deposits | 10361.77 | 11955.54 | 14105.10 | 36.13% |
| Other Deposits | 1254.62 | 1319.97 | 1732.59 | 38.10% |
| Deposits in Foreign Currency | 1188.43 | 1212.98 | 1235.86 | 3.99% |
| Bond | 1165.40 | 1520.35 | 2037.88 | 74.87% |
| Central Bank Bonds | 0.00 | 0.00 | 0.00 | 0.00% |
| Paid-up Capital | 1094.91 | 1196.94 | 1425.21 | 30.17% |
| Others (net) | (1169.36) | (1279.89) | (2178.22) | 185.27% |

Sources: *Almanac of China's Finance and Banking 2003-2005*

The state promoted a new round of reform of commercial banks by combining stock adjustment with incremental reform. On the one hand, the National Financial Work Conference of the CPC Central Committee held in

2002 clearly made the reform of state-owned banks the top priority of the national financial reform. According to the modern commercial bank system, the state-owned banks should be reformed into joint-stock commercial banks, the property right structure should be optimized, the policy burden should be lightened, the state credit should be promoted, and the state-owned banks should be established into joint-stock commercial banks in general sense. At the same time, it is clearly put forward that the mature joint-stock commercial banks should be listed.

Generally, it can be divided into three steps: Firstly, use the national resources to reduce the burden of banks; the financial restructuring of state-owned banks through write-off, capital injection, debt issuance and other means can completely get rid of the historical burdens. At the end of 2003, when the Bank of China (BOC) and the China Construction Bank (CCB) were restructured into joint-stock companies with a total capital injection of \$45 billion, RMB 140 billion of loans of the BOC and RMB 56.9 billion of loans of the CCB were written off. Subsequently, in 2004, BOC's RMB 149.8 billion and CCB's RMB 128.9 billion doubtful loans were stripped to Cinda Asset Management at 50% of the price. In April 2005, the shareholding system reform of ICBC was launched, and Central Huijin Investment Ltd. injected US \$15 billion to it. In May, ICBC stripped the equivalent of RMB 246 billion of non-performing loans of the loss category to Huarong Asset Management. In June of the same year, ICBC divided another RMB 459 billion of doubtful loans into 35 asset packages by region and sold them to

four asset management companies.

The four state-owned banks successively completed the shareholding system transformation, and then listed in public, becoming publicly-owned banks subject to social supervision; Secondly, in the light of the relevant provisions of Articles 54 and 55 of Chapter V of the *Commercial Bank Law* (Revised 2003), commercial banks shall establish and improve their own financial and accounting systems in accordance with the law and the unified accounting system of the State and the relevant regulations of the banking supervision institution of the State Council. A commercial bank shall, in accordance with the relevant provisions of the State, truthfully record and comprehensively reflect its business activities and financial situation, prepare an annual financial accounting report, and promptly submit it to the banking supervision institution of the State Council, the People's Bank of China and the financial department of the State Council. These relevant laws and regulations improved corporate governance and management capabilities from the institutional level; Thirdly, the bank introduced foreign strategic investors in line with its own situation and the scope of business. In 2006, Goldman Sachs, Allianz Group and American Express contributed \$3.78 billion (amount to RMB 29.5 billion) to acquire about 10% stake of ICBC. Later, Royal Bank of Scotland, Temasek Holdings of Singapore (TMSK), United Bank of Switzerland and the Asian Development Bank (ADB) invested \$5.175 billion (amount to RMB 40.3 billion) in BOC, acquiring less than 20% of the shares. Bank of America and TMSK paid \$2.5

billion and \$1.466 billion respectively to purchase 9% and 5.1% of CCB's equity (about RMB 30 billion) with about HK \$0.94 per share. Hong Kong and Shanghai Banking Corporation (HSBC) held a 19.9% equity in BCM by contributing RMB 14.461 billion to purchase 9.115 billion shares.

Table 3-6 Introduction of Foreign Investment by the China Commercial Banks, 2003-2009

| Item/year | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2009 |
|--|---------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|---------|
| | Balance | Accumulated Data of the Current Year | Accumulated Data of the Current Year | Accumulated Data of the Current Year | Accumulated Data of the Current Year | Accumulated Data of the Current Year | Accumulated Data of the Current Year | Balance |
| Numbers of Chinese Banks Introducing Overseas Investment | 5 | 6 | 7 | 6 | 5 | 6 | 0 | 31* |
| Amount of Introduced Investment (unit: USD Billion) | 0.26 | 2.35 | 11.69 | 5.22 | 1.76 | 11.52 | 0.21 | 32.99 |
| Funding Amount from Overseas (unit: USD Billion) | - | - | 11.39 | 29.9 | 4.22 | 0 | 3.93 | 49.43 |
| Total(unit: USD Billion) | 0.26 | 2.35 | 23.08 | 35.12 | 5.98 | 11.52 | 4.14 | 82.42 |

Sources: The CBRC's 2009 annual report, * means that the figures differ from the sum in the table, because some banks introduced multiple strategic investors at different times.

Meanwhile, the state-owned commercial banks also introduced advanced technology and management experience from abroad by "attracting foreign investment" in the process of reform of shareholding system. Taking HSBC's participation in BCM as an example, HSBC became a strategic partner of

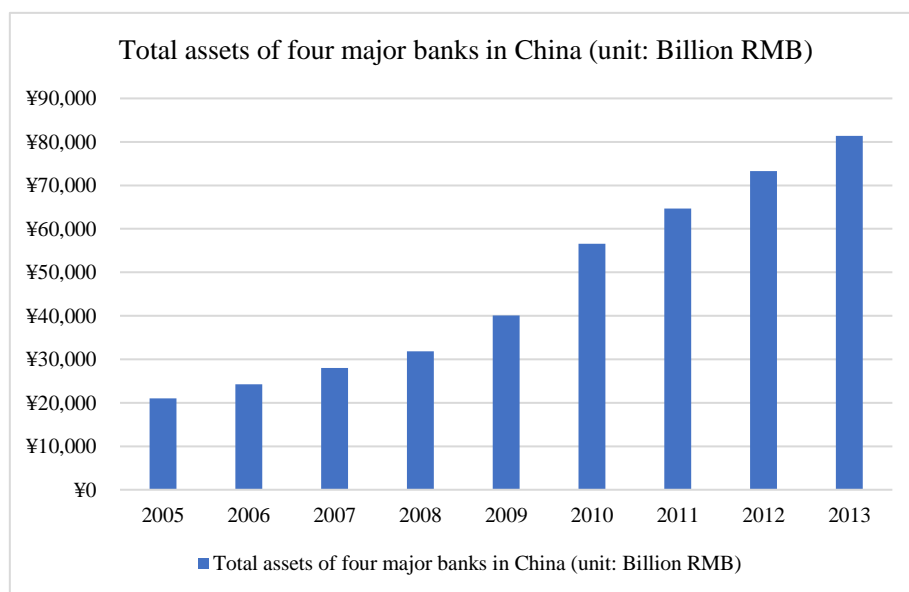
BCM, and was directly involved in the operation and management of BCM. On the one hand, the nomination of two directors of HSBC was confirmed by the shareholders' meeting and they would participate in the operation and management of BCM through the Board of Directors. On the other hand, HSBC had the right to send a senior executive to the senior management of BCM. The strategic cooperation between BCM and HSBC would be carried out in multiple business areas. Under the *Credit Card Cooperation Agreement*, BCM and HSBC would work together to establish an independent business unit to engage in credit card business. In terms of technical support and cooperation, according to the *Technical Support and Assistance Agreement*, HSBC would provide regular technical support and services to BCM every year, including risk management, corporate governance and internal management, financial management, asset liability management and human resource management. BCM can send a small amount of key members to HSBC every year to study management. The infusion of foreign capital broke the singleness of the property right structure of state-owned banks, improved the management mechanism and strengthened the corporate governance ability.⁵⁹

This new round of reform, with the reform of property rights as its core, the reform of shareholding system as its symbol and the establishment of modern commercial bank system as its goal, basically realized its original intention.

⁵⁹ Xia Jiming. *Research on International Equity Cooperation of Chinese Banking Industry* [D]. Institute of Fiscal Science, Ministry of Finance, 2011.

By introducing market competition and updating the ownership structure of state-owned banks, the Chinese government enabled commercial banks to have rigorous and efficient internal management processes. The finance of state-owned banks was restructured through write-off, capital injection, debt issuance, the introduction of foreign capital, which invigorated their operating capacity. During this period, the asset quality of state-owned commercial banks has increased, the banks' profitability improved, and their non-performing loan ratio decreased. At the same time, the state-owned banks were quickly recognized by the international community. By the end of 2013, the total assets of the four state-owned banks had their total assets reach RMB81.39 trillion, four times the total assets of 2003; On the other hand, the market-oriented commercial banking system would be established by further enriching the market players and improving the competitiveness of the banking industry.

Figure 3-1 Asset Size of the Four Major Banks in 2005-2013

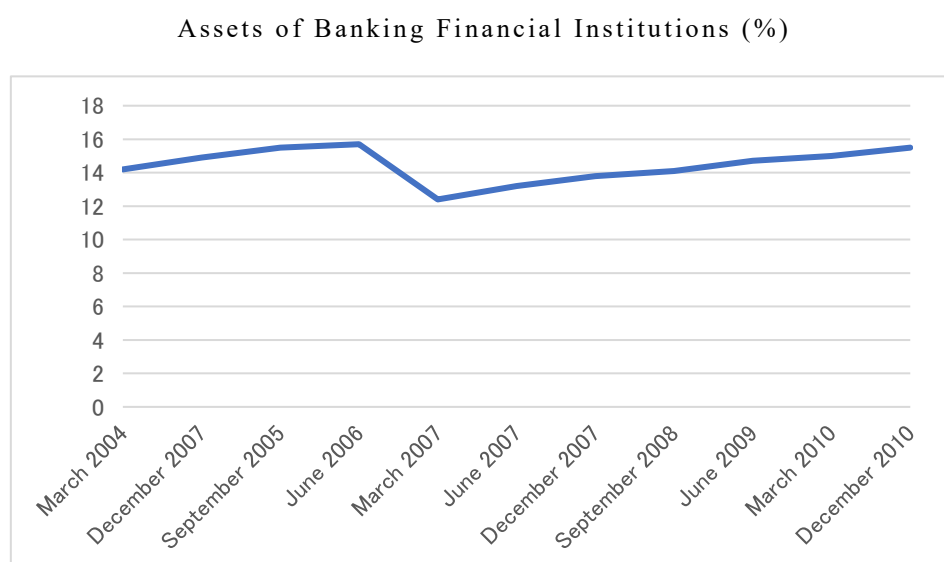


Sources: *Almanac of China's Finance and Banking 2005-2013*

3.3.2 "Upgrading and Transformation" of Joint-Stock Banks

Since 2003, small and medium-sized banks have entered the golden development period, the national joint-stock commercial banks have expanded again, and HengFeng Bank, China Zheshang Bank and China Bohai Bank have either been restructured or newly established. The market shares and the number of institutions are booming, and their asset shares in banking financial institutions are also increasing.

Figure 3-2 Proportion of Total Assets of Joint-Stock Commercial Banks on Total



Sources: China Banking Regulatory Commission, Prospect Database Arrangement

The national joint-stock banks adhere to the combination of internal and external opening up. By introducing foreign strategic investors and institutional investors, they have publicly listed at home and abroad, which has perfected the national network.

In the meantime, joint-stock commercial banks have also stepped forward for public listing. In this way, the joint-stock commercial banks not only

supplement the capital, but also increase the degree of equity dispersion, which make them well-known at home and abroad. Shenzhen Development Bank Co., Ltd. (stock abbreviation: SDB A, stock code: 000001) was the first commercial bank in China to issue its shares and go public. Afterwards, the joint-stock commercial banks such as Shanghai Pudong Development Bank (SPD BANK), China Minsheng Bank Corp., Ltd. (CMBC) and China Merchants Bank (CMB) were listed successively, which made the inflow of funds possible. After listing, the scale of joint-stock commercial banks expanded rapidly. Taking CMB as an example, in 2013, the CMB had 113 branches and 934 outlets in 110 cities, while in 2003 the number of outlets was only 373.

At the same time, joint-stock commercial banks pay attention to technological innovation and introduction, constantly launching new financial products and optimizing income structure. The market value is widely recognized.

Table 3-7 Listing Process of Joint-Stock Commercial Banks from 1991 to 2013

| Date | Bank | Transaction Place |
|--------------------|---|------------------------------------|
| April 3, 1991 | Shenzhen Development Bank (the current Ping An Bank) | Shenzhen Stock Exchange (A-shares) |
| September 23, 1999 | SPD Bank | Shanghai Stock Exchange (A-shares) |
| December 19, 2000 | CMBC | Shanghai Stock Exchange (A-shares) |
| April 9, 2002 | CMB | Shanghai Stock Exchange (A- |

| | | |
|--------------------|-----------------------|-------------------------------------|
| | | shares) |
| July 21, 2003 | Hua Xia Bank | Shanghai Stock Exchange (A-shares) |
| September 22, 2006 | CMB | Hong Kong Stock Exchange (H-Shares) |
| April 19, 2007 | China CITIC Bank | Shanghai Stock Exchange (A-shares) |
| November 26, 2009 | CMBC | Hong Kong Stock Exchange (H-Shares) |
| August 19, 2010 | China Everbright Bank | Shanghai Stock Exchange (A-shares) |

Data sources: CSMAR database: <http://cndata.csmar.com/>.

In December 2002, SPD Bank and CitiBank signed the *Strategic Cooperation Agreement*, and the two sides agreed to carry out strategic cooperation in corporate governance, audit compliance, risk management, restructuring, business development and other aspects. SPD Bank hopes to introduce strategic investors and exchange technology, management, market and products from the world famous banks with a small amount of equity (4.62% of CitiBank's equity participation), to make the bank bigger and stronger quickly, which will be invincible in the fierce competition market and develop into a better international commercial bank in the next decade. In comprehensive management and international development, CITIC Bank will take advantage of the unique CITIC Financial Integrated Management Platform and the "trinity" strategic system formed with BBVA Bank of Spain and CITIC International Financial Holding Company, so as to foster comprehensive and international management characteristics. In 2006, CITIC Bank transferred 5% of its equity to Spain's BBVA Bank for EUR500

million, successfully attracting international strategic investors. After that, BBVA Bank increased its holdings and now holds 15% of CITIC Bank, becoming the second largest shareholder of CITIC Bank. In addition, BBVA Bank and CITIC Bank cooperated in risk management, financial services, cash management, fund custody, auto finance, private banking, capital and other business areas.

Almost all joint-stock banks have set their strategic goal of becoming better international banks and developed an internationalization strategy. However, in view of the existing international environment, the CMB is clearly in the forefront, mainly in the acquisition of Wing Lung Bank of Hong Kong, the establishment of a Hong Kong branch, a New York branch and a representative office in London, and the establishment of branches in almost all international financial centers. But the proportion of its foreign assets is still very low, so it cannot be called an international commercial bank yet. The internationalization strategy of other joint-stock banks is in progress. In the long run, internationalization strategy is helpful to develop the bank's international business and enhance its brand influence.

3.3.3 Promote Financial Innovation and Allow Foreign Banks to Enter the Chinese Market

In 2006, the State Council issued *Regulations on the Administration of Foreign Banks*, which abolished the geographical restrictions on foreign banks' RMB business, allowed foreign banks to provide RMB services to all

their clients, removed non-prudential restrictions on foreign banks' operations in China, and abolished the supervision of foreign banks' RMB business, marking the advent of the era of opening up of China's banking industry. Foreign banks actively enter the Chinese market by expanding their own institutions and investing in Chinese banks. The Chinese government is also actively fulfilling its WTO commitments, gradually liberalizing the foreign exchange business of foreign banks, and broadening the scope of foreign banks' clients and regions engaged in RMB business.

With the improvement of the financial market, the products in the financial transaction market and the opening up of the banking industry, the financial innovation of commercial banks embraces broader space and more complete means. Financial innovation has become an important development path for commercial banks to meet the basic needs of the market, enhance their core competitiveness and reduce operational risk. The products and services provided by commercial banks have been rapidly enriched, and the convenience of customers to enjoy banking services has been greatly improved. A single banking service mode is being replaced by an open, flexible and diversified service mode. In the new century, financial innovation has shown some new characteristics that are significantly different from the traditional financial innovation. Financial innovation activities have not only been based on the improvement and invention of technology, but also become the key for commercial banks to adapt to the new environment and maintain their survival and development through their

own transformation and evolution.

3.3.4 Establish the Banking Regulatory Commission and the Financial Supervision System of "One Bank and Three Commissions"

In October 1992, the founding of Securities Commission of the State Council and China Securities Regulatory Commission (CSRC) was proclaimed, marking the initiation of the unified regulation mechanism for China's securities market. Securities Commission of the State Council is the competent authority for centralized and macro administration on the securities market designated by the state. CSRC is the regulatory and execution institution of the Securities Commission of the State Council and regulates and supervises China's securities market in accordance with laws and regulations.⁶⁰ On November 18, 1998, the China Insurance Regulatory Commission (CIRC) was established, which is a public institution directly under the State Council. CIRC performs the administration function according to the authorization of the State Council and makes centralized supervision and regulation on China's insurance market in accordance with laws and regulations to maintain the legal and stable operation of the insurance industry. The establishment of the CIRC is primarily to achieve the separation of financial macro-control and micro-supervision. This is an inevitable requirement for the increasingly complicated, specialized and technical financial industry and financial markets of supervision and

⁶⁰ Yu Liang. Research on China's Banking Supervision Issues and Countermeasures [D]. Jilin University, 2014.

regulation. Five years later, in 2003, the China Banking Regulatory Commission (CBRC) was established as an institution directly under the State Council at the ministerial level in accordance with the institutional reform plan of the State Council approved at the First Session of the Tenth National People's Congress and the *Circular of the State Council on the Establishment of Institutions* (GF (2003) No. 8). Its official performance of duties commenced on April 28, 2003. The CBRC shall be assigned to the supervisory responsibilities of the People's Bank of China (PBOC) for banking financial institutions and the relevant responsibilities of the former Financial Work Committee of the CPC Central Committee. The former Bank Supervision Division I, II, Non-bank Financial Institution Supervision Division, Cooperation Division and Bank Management Division of the PBOC have been reintegrated. The new departments of the integrated China Banking Regulatory Commission are: The Supervision Department I is responsible for state-owned commercial banks, the Supervision Department II is responsible for joint-stock commercial banks, and the Supervision Department III is responsible for foreign capital and policy banks, while the supervision department of non-bank financial institutions and the supervision department of cooperative financial institutions are responsible for financial institutions such as trust companies, leasing companies and asset management companies. The main responsibilities of the CBRC at the beginning of its establishment include: (1) To formulate rules, regulations and methods for the supervision of banking financial institutions, draft relevant laws and administrative regulations, and put forward proposals for

their formulation and revision. (2) To examine and approve the establishment, alteration, termination and business scope of banking financial institutions and their branches. (3) To implement on-site or off-site supervision of the banking financial institutions, investigate and punish the violations of laws and regulations according to law. (4) To approve the qualifications of senior managers of banking financial institutions. (5) To be responsible for the unified compilation of data and statements of national banking financial institutions, copy them to PBOC and release them in accordance with the relevant provisions of the State. (6) To put forward opinions and suggestions on emergency risk disposal of deposit-related financial institutions in conjunction with the Ministry of Finance and PBOC (7) To take the responsibility of routine management on the board of supervisors of major state-owned banking financial institutions. (8) To undertake other tasks assigned by the State Council. The establishment of CBRC marks the formal establishment of the financial structure of "One Bank and Three Commissions" (People's Bank of China, China Securities Regulatory Commission, China Insurance Regulatory Commission and China Banking Regulatory Commission), which plays a very important role in enhancing the competitiveness of the three markets of banking, securities and insurance and preventing financial risks on a larger scale. At the same time, China's banking industry refers to the *Basel Accord* to improve the management system, making the regulatory system in line with international standards. Since its establishment, the CBRC has formulated a series of banking supervision reform measures that serve China's national conditions:

First, to gradually improve the banking supervision system laws and regulations, and formulate a set of prudential supervision rules and systems for the capital supervision, risk management and internal control; Second, to clarify the overall goal of banking supervision, emphasize the maintenance of financial stability and financial order, and encourage the innovation of banking business to improve the overall competitiveness of the banking industry. Third, to improve the means and methods of banking supervision, adhere to the supervision philosophy and methods of off-site supervision as the core and on-site supervision as the supplement, comprehensively use the new generation of information technology means to realize the transformation from general administrative management to multiple-means coordinated supervision.

3.3.5 The Emerging of Rural Commercial Banks

By the end of June 2003, there were 34,909 legal entities in national rural credit cooperatives, including 32,397 rural credit cooperatives, 2,441 county-level cooperative associations, 65 municipal (local) cooperative associations and 6 provincial-level cooperative associations, with 628,000 employees. The balance of various deposits was RMB2.233 trillion, accounting for 11.5% of the total balance of deposits in financial institutions. The balance of various loans reached RMB1618.1 billion, accounting for 10.8% of the total loan balance in financial institutions. By the end of November, the national rural credit cooperatives had a surplus of RMB148 million. 17 provinces had surpluses, totaling RMB3.55 billion. In 2003, the

reform plan of rural credit cooperatives was released, and the CBRC formulated the *Provisional Regulations on the Administration of Rural Commercial Banks*. Article 2 of the Regulations stipulates that rural commercial banks are joint-stock local financial institutions initiated and established by farmers, rural industrial and commercial households, business entities and other economic organizations within the jurisdictions. By the end of 2014, the proportion of qualified shares in rural credit cooperatives had dropped below 30%, with 303 rural commercial banks and 210 rural cooperative banks established. The total assets of rural banking institutions accounted for 41.4% of the national rural cooperative financial institutions. In addition, 1,424 rural credit cooperatives have met or basically met the requirements for the establishment of rural commercial banks. The cooperative financial institutions of the CBRC said that, China will completely abolish the qualification shares, encourage qualified rural credit cooperatives to be reorganized into rural commercial banks, no longer form new rural cooperative banks, and all rural cooperative banks will be restructured into rural commercial banks.

The banking reform of rural credit cooperatives is a major event in the reform of China's financial system. Since the pilot reform of rural credit cooperatives in Jiangsu Province in July 2000, the trend of the banking of rural credit cooperatives has gradually become clear and accelerated. By the end of June 2015, 728 rural commercial banks had been established in China. At present, the banking reform of rural credit cooperatives is still in

progress, but the institutional dividend has been presented. The institutional dividend brought by the banking reform is manifested in many aspects.

(1) Important changes have taken place in rural credit cooperatives.

The equity structure is optimized, and the corporate governance is clearly standardized. In the process of banking reform, rural credit cooperatives regulated the disposition of the original stock funds, re-raised the share capital, initiated the establishment of rural commercial banks, have thoroughly clarified the property rights relationship and realized the transformation from the cooperative system (or the joint-stock cooperative system) to the joint-stock system, showing the trend of "three modernizations". First, shareholders are diversified. As different investment entities participate in decision-making and supervision, rural commercial banks could hear the different opinions from different levels, understand the development of different industries, and receive different suggestions, so as to make the management decision more scientific, the system operation more standardized, and the corporate governance more effective. Second, equity is optimized. By setting promoter's qualification conditions, raising the starting point for single-family investors to buy shares, and mobilizing small and medium-sized enterprises to buy shares, the number and proportion of legal person shares of rural commercial banks have increased substantially, and the problems of "more members, less single-family stock funds and dispersed shares" have been effectively resolved, which weakened insider control

to a certain extent. Take Anhui Province for example, at the end of 2014, all 83 rural credit cooperatives were totally restructured into rural commercial banks, and the stock capital situation of rural commercial banks was also significantly improved (see Table 3-8). Third, governance is standardized. After the establishment of rural commercial banks, the voting rights were determined according to the shares, which changed the decision-making rule of "one person, one vote", increased the voice and voting rights of the major shareholders, especially the strategic investors, and further strengthened the effective restriction of the property rights on the operation and management behavior. According to their own reality, many rural commercial banks revise their articles of association, refine the rights and obligations of "Three Boards and One Layer", improve the operating rules of "Three Boards and One Layer", implement the appraisal system of independent directors and external supervisors, carry out the performance appraisal of directors and supervisors, establish the mechanism of decision-making supervision, information disclosure and communication and exchange for important matters, and gradually standardize the modern enterprise system

Table 3-8 Comparison of Stock Funds of Rural Commercial Banks in Anhui Province

| Annually | Capital sum | Institutional shares | Proportion of legal person | Natural person shares | Proportion of Natural | Private capital | Proportion of private capital | Capital of high-quality private enterprise | Proportion of high-quality private |
|----------|-------------|----------------------|----------------------------|-----------------------|-----------------------|-----------------|-------------------------------|--|------------------------------------|
| | | | | | | | | | |

| | | | n share s (%) | | perso n share s | | | ses | enterpri ses capital |
|------|------------|--------|---------------------|------------|--------------------------|------------|-------|--------|----------------------------|
| 2014 | 345.2 8 | 233.99 | 68.24 | 111.2 9 | 31.76 | 307.8 0 | 89.15 | 176.70 | 51.17 |
| 2015 | 9.31 | 0.96 | 10.31 | 8.35 | 89.69 | 8.89 | 95.49 | 0.96 | 10.31 |

Data sources: China's social and economic data research platform.

The management level has been improved, and the service area has been significantly expanded. In the process of banking reform, most rural credit cooperatives took the upgrading activities as the starting point, strengthened the management, improved the operating conditions, implemented the *Guidance on the Construction of Risk Management Mechanism of Small and Medium-sized Financial Institutions in Rural Areas* according to the requirements of the CBRC, built a comprehensive risk management system, and created a risk management culture. After the reform, rural commercial banks adjusted

the organizational structure, created process banks, strengthened capital constraints, optimized business structure, and improved performance appraisal in accordance with the *Guidance on the Implementation of Process Bank by Rural Commercial Banks and Rural Cooperative Banks* and *Capital Management Measures for Commercial Banks* by CBRC. Shifting from the extensive development model to the intensive development model, the risk management capability, core competitiveness and sustainable development capability have been further improved. With the qualification to expand

comprehensive business and cross-regional development, some of rural commercial banks also have opened credit card business, financial management business, international business, external insurance and internal loan, and tried asset securitization, derivatives and market makers. Some rural commercial banks also issued secondary capital bonds, small and micro enterprise financial bonds, and carried out financial leasing, precious metals leasing and commercial factoring cooperation with other institutions. For example, Tianjin Binhai Rural Commercial Bank Corporation and Great Wall Motor Co., Ltd. jointly established an Auto Financial Company. Some rural commercial banks also set up branches across regions, initiated the establishment of rural banks, and transformed from local commercial banks to regional commercial banks. These changes make rural commercial banks expand the scope of business, showing a trend of comprehensive management and cross-regional development, therefore, make the source of income gradually diversify, and enhance the adaptability and coping capacity of interest rate marketization.

The number of non-performing assets has decreased and the ability to resist risks has greatly improved. With the improvement of management, the ability of credit risk prevention and control of rural credit cooperatives has been enhanced, and the quality of assets has been gradually improved. According to the four-category assets classification, the balance of non-performing loans and its proportion of the rural credit cooperatives were RMB318.3 billion and 5.6% respectively in 2010, which decreased by

RMB196.4 billion and 24.12% compared with 2003. According to the five-category assets classification, at the end of June 2015, the balance of non-performing loans of the rural credit cooperatives was RMB483.8 billion, accounting for 4.2 percent of the total, decreased by 1.3 percent from 2011. In particular, the asset quality and anti-risk capacity of rural commercial banks are much higher than the average level of the rural credit cooperatives and comparable to other commercial banks (see Table 3-9).

Table 3-9 Comparison Table of Major Supervision Indicators between Rural Commercial Banks and Other Commercial Banks in June 2015

| Institutional Indexes: | Rural Commercial Banks | Large-scale Commercial Banks | Joint-stock Commercial Banks | Urban Commercial Banks | Foreign Banks |
|------------------------------------|------------------------|------------------------------|------------------------------|------------------------|---------------|
| Balance of NPL (unit: RMB Billion) | 147.4 | 607.4 | 211.8 | 112.0 | 13.3 |
| Ratio of NPL | 2.20 | 1.48 | 1.35 | 1.37 | 1.16 |
| Return on Asset Ratio | 1.32 | 1.32 | 1.11 | 1.12 | 0.55 |
| Provision Coverage Ratio | 209.38 | 193.74 | 195.09 | 219.53 | 196.05 |
| Capital Adequacy Ratio | 13.09 | 13.81 | 11.34 | 11.94 | 17.72 |

Sources: China Banking Regulatory Commission, *Table of Main Indicators of Commercial Banks by Institutions (Legal Person) (2015)*

The scale of operation has been expanded and the profitability has been

significantly improved. Since the reform, the scale of operation of rural credit cooperatives has been expanded, and the proportion in banking institutions has been increasing (see Table 3-10). By the end of 2014, the assets and liabilities of rural credit cooperatives had reached RMB21.3155 trillion and RMB19.7956 trillion, respectively, 7.93 times and 6.95 times of those of 2003; The proportion in banking institutions reached 12.37% respectively, increased by 2.67% and 2.26 % respectively compared to that of 2003. It can be seen from Figure 1: For a long time, the profits and owner's equity of rural credit cooperatives are not commensurate with their assets and liabilities, which is far lower than that of other banking financial institutions. Through the banking reform, rural credit cooperatives have gradually been improved, especially from 2010, the speed accelerated until 2014, after-tax profits and the proportion of owner's equity are commensurate with its assets, liabilities.

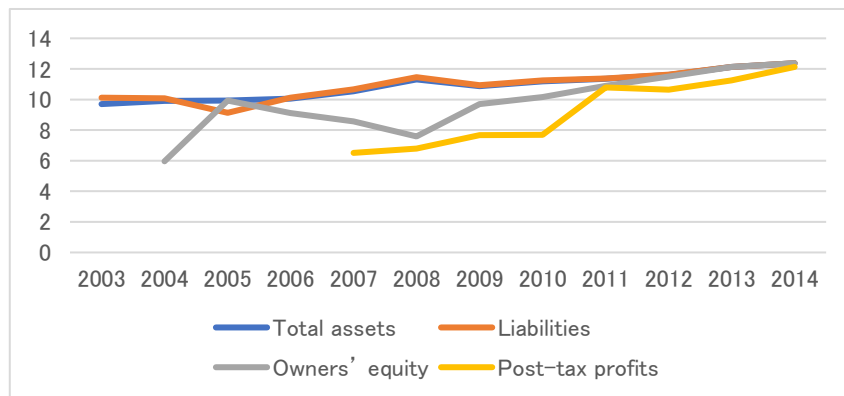
Table 3-10 Assets, Liabilities and Profits of Rural Credit Cooperatives

| S/ N | Item | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---------|------------------------------------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|
| 1 | Total Assets(unit: Billion RMB) | 2689.4 | 3133.2 | 3720.6 | 4419.5 | 5599.1 | 7143.7 | 8639.7 | 10658.3 | 12859.9 | 15512.1 | 18349.1 | 21315.5 |
| | Proportion % | 9.7 | 9.92 | 9.93 | 10.06 | 10.54 | 11.31 | 10.87 | 11.18 | 11.35 | 11.61 | 12.12 | 12.37 |
| 2 | Liabilities (unit: Billion RMB) | 2849.0 | 3057.3 | 3268.0 | 4215.3 | 5338.4 | 6803.0 | 8208.7 | 10064.8 | 12074.2 | 14515.8 | 17115.8 | 19795.6 |
| | Proportion % | 10.11 | 10.08 | 9.13 | 10.11 | 10.66 | 11.46 | 10.93 | 11.25 | 11.38 | 11.62 | 12.12 | 12.37 |
| 3 | Owner's Equity (unit: Billion RMB) | -13.2 | 75.9 | 165.3 | 204.1 | 260.7 | 287.3 | 431.0 | 593.4 | 785.7 | 996.3 | 1233.3 | 1519.8 |
| | Proportion% | | 5.96 | 9.94 | 9.11 | 8.58 | 7.58 | 9.7 | 10.17 | 10.89 | 11.49 | 12.12 | 12.37 |
| 4 | After-tax Profit (unit: | | | | | 29.1 | 939.59 | 51.18 | 69.18 | 122.53 | 160.9 | 196.14 | 233.83 |

| | | | | | | | | | | | | |
|--------------|--|--|--|--|------|------|------|------|-------|-------|-------|-------|
| Billion RMB) | | | | | | | | | | | | |
| Proportion% | | | | | 6.51 | 6.79 | 7.66 | 7.69 | 10.79 | 10.64 | 11.24 | 12.13 |

Data sources: China financial yearbook, Genius Finance: <http://www.genius.com.cn/geniusData.html>. (2003-2014).

Figure 3-3 Profits, Assets and Liabilities of Rural Credit Cooperatives



Data sources: China financial yearbook, Genius Finance: <http://www.genius.com.cn/geniusData.html>. (2003-2014).

(2) Shareholders' sense of participation and returns have increased

Shareholders are investors and decision-makers of rural commercial banks, and the banking reform definitely has a great impact on them. First, shareholders' sense of participation increased. Rural credit cooperatives issued a premium share capital, while the premium was basically used to digest and dispose the non-performing loans. This practice strengthens the shareholders' awareness of venture capital, urges them to pay more attention to the operation and prospects of rural credit cooperatives, and to the protection of rights and interests. Second, the shareholders behaved positively. For example, they actively participated in meetings,

deliberated on voting matters, expressed true ideas, put forward suggestions, and carefully exercised rights and obligations and so on. Some shareholders purchased shares of other shareholders to increase the right to say or vote, improve control and influence over the board of directors. Some shareholders raised questions against some major decision-making issues, management practices and results, proposed motions of shareholders and even mobilized other shareholders to take joint actions. Some major shareholders strengthened communication with senior management personnel of rural commercial banks and appointed personnel to rural commercial banks with executive directors (supervisors) on duty, so as to grasp the information of rural commercial banks in a timely manner and participate in the major issues of decision-making. All of these are the results of shareholders' active participation in decision-making and demanding for standardized management. Third, shareholder return increased. With the gradual improvement of economic efficiency, rural credit cooperatives increased share dividends and shareholder return. For example, 53 rural commercial banks have been set up in Shandong Province. In recent years, the average annual return on capital has reached more than 27%, and the dividend distribution ratio is generally more than 12%, with the highest of 20%.

(3) Government management responsibility has improved

Through holding companies, many local governments have purchased some equity of rural commercial banks at a premium, which on the one

hand strengthens the responsibility of underwriting the risks of rural commercial banks and creating a favorable development environment for rural commercial banks, and also increased the impetus for the reform and development of rural commercial banks. On the other hand, to share rural commercial banks as investors and exercise the management in a market-oriented manner, personnel were appointed to the board of directors (or the board of supervisors) to take up actual posts, participate in the decision-making and exert influence on major strategic issues of rural commercial banks, so as to effectively control the rural commercial banks by non-administrative means. To a certain extent, the rights and interests of small and medium-sized shareholders will be protected, the legal operation and development in a scientific manner and "system reform, unchanged service for 'rural, agriculture and farmers'" will be promoted to strengthen the support for the construction of new socialist countryside and ensure the implementation of the national financial policy in place.

(4) Customer satisfaction has been promoted

First, diversified financial needs have been met. After the reform, rural credit cooperatives have developed toward the comprehensive operation, expanding the service field and business scope, and meeting the diversified needs of customers effectively. Second, the development of "Internet plus" has been promoted. With the banking reform, the increased resources of rural credit cooperatives and the optimization of

the staff structure have accelerated the innovation of "Internet plus Finance". By issuing bank cards, promoting mobile banking, online banking, telephone banking, lay outing ATM and POS, setting up farmers' information clerks, lay outing farmers' self-service terminals, etc., the problems of "one kilometer" in rural financial services has been effectively solved, bringing great convenience to customers. In 2014, the number of bank cards issued by rural credit cooperatives reached 686.6 million, accounting for 13.91% of the banking institutions. The number and amount of bank card fund transactions were 1586.7 million and RMB16784 billion, accounting for 9.31% and 14.33% of the banking institutions respectively. There are 117,000 ATMs, accounting for 19.02% of banking industry institutions. From January to April 2015, the self-service transactions on Nongxintong were 20.1374 million totaling RMB349.6 billion and the mobile banking transactions were 7.72 million totaling RMB26.9 billion. Third, financial inclusion has been promoted. In the process of banking, the majority of rural credit cooperatives did not evacuate the poor-profit outlets in remote areas, but increased the number of business outlets. At the end of 2014, there were 78,246 outlets of rural credit cooperatives, 2,528 more than in 2009. At the same time, many rural commercial banks also set up branches and village banks in other places. On the one hand, they filled in the blank of some township financial outlets and enhanced the adequacy and diversity of local financial services; On the other hand, they enhanced the competition of local financial institutions and promoted the improvement of local

financial services, thus making the mass customers benefit. Fourthly, the service ability has been improved. After the transformation of rural credit cooperatives into rural commercial banks, the capital increased, the capital adequacy ratio increased, and the single-family loan limit increased correspondingly, thus the ability to support "agriculture, rural areas and farmers" improved, effectively satisfying the large credit demand of high-quality customers. At the end of June 2015, the agricultural loans and farmers' loans of the rural credit cooperatives reached RMB7.5 trillion and RMB3.6 trillion, an increase of RMB3.6 trillion and RMB1.6 trillion from 2010 respectively. Fifth, the customer revenue has been increased. After the rural credit cooperatives were restructured into rural commercial banks, the business tends to be commercialized, and they have autonomy in interest rate pricing. The deposit interest rate is higher than the benchmark interest rate, and the income from financial product is higher than the deposit interest rate. On the one hand, the customer income is increased, on the other hand, the outflow of rural funds is reduced, and urban capital is attracted into rural areas, increasing the source of credit funds, while loans have adopted negotiated interest rates and differentiated interest rates, reducing the cost of financing of lenders. To sum up, the banking of rural credit cooperatives improved rural financial services availability and customer satisfaction.

(5) Prosperity of rural financial market is increasing

The first is to set up branches across districts. For example, Changshu Rural Commercial Bank has 28 branches (branch offices) in other places, Zhangjiagang Rural Commercial Bank has 9 branches in Jimo, Qingdao and other places, and Tianjin Binhai Rural Commercial Bank has set up branches in Kashi, Korla, Aksu, Xinjiang and Shaoxing, Zhejiang. Second, village banks across districts have been established. At the end of 2013, there were 1,071 rural banks in China, of which 498 were initiated by rural banking institutions, accounting for 47 percent. In Shandong Province, as of June 2015, there were 109 village banks and 157 outlets, of which 80 (73.4%) were initiated by rural commercial banks. Rural banking institutions set up branches across regions, initiated village banks, on the one hand, to achieve the strategic concepts of national "eastern support for the western, urban support for the rural", and the return of funds to the rural areas, and weaken the "siphon" effect of rural funds. On the other hand, they have increased the rural financial main body and business network, enriched the rural financial system, further promoted the competition of the rural financial market, increased the vitality of the rural financial market, and greatly improved the availability and satisfaction of rural financial services. For example, the Shanghai Rural Commercial Bank has initiated 35 village banks in six provinces and cities, including Shandong, Hunan, and Yunnan, among which 7 are located in national poverty-stricken counties and provincial poverty-stricken counties in the central and western China, and 8 in old revolutionary base areas, areas inhabited by ethnic minority groups,

border areas and poverty-stricken areas in Yunnan where the economy is lagged behind and there is a blank in financial services, thus became an important channel for serving agriculture, rural areas, and farmers. In 2014, 35 village and township banks set up by the bank granted loans of RMB12.73 billion, 94.4% of which went to farmers and local small and micro enterprises, which promoted rural economic prosperity and coordinated development of urban and rural area, especially played an important role in avoiding the outflow of funds from less developed areas and changing the economic situation in poor areas. Third, the banks participated in rural financial institutions. For example, being strategic investors, Zhangjiagang Rural Commercial Bank invested in Changchun, Jilin Province, Xiuning, Anhui Province and Kunshan, Xinghua and Taixing, Jiangsu Province, and Changshu Rural Commercial Bank invested in six rural financial institutions, including Lianyungang Oriental Rural Commercial Bank, Tianjin Rural Commercial Bank, and Wuhan Rural Commercial Bank, bringing advanced management concepts, management models and management technologies. They have promoted the transformation of rural credit cooperatives, enhanced their competitiveness, not only improving the local financial development pattern, but also changing the national banking development pattern. For example: Wuhan Rural Commercial Bank has become the top of credit and tax payment bank in Wuhan, ranking 44 among the top 100 enterprises in Hubei Province, and has been rated as a "Good Banking Institution" in Hubei Province. Changchun Rural Commercial Bank has become "the

advanced financial services institution for small business in national banking financial institutions" and "Top ten Rural Commercial banks in China"; After five years of development, at the end of June 2015, the assets of Tianjin Rural Commercial Bank doubled to RMB248 billion, with net assets of RMB2.3 per share, ranking the 356th in the world banking industry and the 39th in China's banking industry. The three typical examples above illustrate: The rural credit cooperatives have achieved the effect of "1 + 1 > 2" through the priority on support, equity integration, strong-strong combination, urban integration, merger and reorganization, and group development. This provides a useful exploration for tackling the key problems of banking and deepening the reform in the next step.

At present, the banking reform of rural credit cooperatives has achieved phased results, but although some rural credit cooperatives have been changed into rural commercial banks, there are still some problems in the system, mechanism, operation and management, and there also exists factors restricting the scientific development, thus, the reform need to be deepen to release the reform dividends. With the accession of the banking industry to the WTO, and the implementation of the expansion of opening up, many restrictions on rural commercial banks have been gradually removed. At the same time, the urban commercial banks began to introduce strategic investors, introduce advanced business management concepts, business methods and good products, restructuring or public

listing, to improve market competitiveness.

3.4 Transition and Development Stage under the New Normal of Economy (2014 - present)

3.4.1 Challenges for Commercial Banks under the New Normal of Economy:

First, facing the challenge of changing the traditional banking management philosophy under the high-speed growth model. At present, new changes have taken place in the economic environment on which China's banking industry depends, a moderate growth rate of around 7% will become the new normal of China's economy. In order to adapt to the long-term medium-speed economic growth environment, the banking industry should make corresponding adjustments and changes in the business development strategy, business development model, customer service mode and business management concept formed under the high-speed economic growth environment.

Second, they face with the challenge of boosting economic restructuring, upgrading and enhancing the ability of serving the real economy. Under the new normal of economy, the financial industry will give full play to its leading and supporting role in adjusting the economic structure and upgrading the industrial level. Through the effective resource allocation, it can fully meet the financial services requirements in line with the new normal, especially to address the long-standing problems of inadequate financial services for small and micro enterprises, agriculture, rural areas

and other fields, high social financing costs, and difficult access to financing.

Third, face the pressure of asset quality rebound, especially the challenges of regional risk accumulation. For a long time, the non-performing loans in China's banking industry have maintained a good situation of "double-decline" for a long time. In 2012, the asset quality of China's banking industry reached the highest level in history, and the non-performing loan ratio remained at the lowest level of 1% in history. Influenced by the slowdown of economic growth, the acceleration of deleveraging and debubbling, and the overcapacity of some industries, the non-performing loan ratio of China's banking industry is in a recovery state. Although China's banking industry is fully prepared for this, including a high level of capital adequacy (about 12%) and provisioning coverage (about 250%), the full exposure of regional financial risks to the banking industry can't be excluded. It can be expected that under the new normal of economy, with the passage of time and the pace of economic restructuring accelerated, the asset quality is facing greater pressure of rebound, and how to prevent the financial risks that may arise from this become a real challenge in front of China's banking industry.

Fourthly, face the challenge of intensifying industry competition under the background of regulatory policy adjustment. In order to meet the requirements of the new normal of economy, China's monetary policy, industrial policy, credit policy and regulatory policy will be adjusted,

especially that the alternative use of traditional and innovative tools of monetary policy will become the new normal of China's monetary policy in the future. At the same time, China's financial structure is undergoing profound changes, the trend of financial disintermediation is further strengthened, and the formal introduction of deposit insurance system will greatly change the operating environment of the banking industry. Under the new normal of economy, not only the competition among the financial institutions within the banking industry in China is intensifying, but also the competition among the banking industry, securities and futures industry and insurance industry for deposit funds and high-quality customers will be intensifying.

3.4.2 The development trend of Commercial Banks under the New Normal of Economy

The healthy development of commercial banks is affected by the macro environment to some extent. A sound and stable macroeconomic environment could provide a basis for the healthy development of commercial banks. Currently, China's financing channels are still dominated by indirect investments of commercial banks. Thus, the operation of social economy would be affected by the business operations of commercial banks and be positively correlated with the latter. The main funds of Chinese commercial banks are derived from deposits of urban and rural residents and most profits of these banks are personal consumption loans and housing loans. According to the statistics of the credit receipts and expenditure for Chinese financial

institutions from 2009 to 2018, the deposits of financial institutions increased from 5.98 trillion RMB to 17.75 trillion RMB, with the compound annual growth rate (CAGR) of nearly 11.5%. The amount of loans at financial institutions also witnessed a stable growth and jumped from 3.99 trillion RMB in 2009 to 13.63 trillion RMB in 2018, with the CAGR of almost 13.05%. As China's national strength is gradually strengthened, the income level of residents is gradually increasing, indicating that the development of China's commercial banks is about to witness a good opportunity. In 2018, China's economic growth reached 6.6%, making it rank among the top of world economies. The per capita disposable income of the country kept the same pace with its economic growth. Its ability to resist risks has been gradually enhanced. Also, the Chinese government's expansion of infrastructure layout, intensification of construction investments and the vigorous development of Chinese enterprises mean development opportunities for Chinese commercial banks. The Chinese government will continue to deepen financial system reform and to promote the regulation mechanism of "interest rate marketization." Next, the Chinese government and the banking administration will focus on the development of private banking institutions, rural banks as well as small- and medium-sized rural commercial banks, into which private capital is injected, drive the robust development of China's macro economic environment and implement the inclusive finance policy by investing in small- and medium-sized enterprises as well as agriculture, countryside and farmer related industries. In summary, as the Chinese government adjusts the industry

structure and carries out financial system reform, commercial banks will benefit from China's stable economic environment and witness new development opportunities.

Figure 3-4 Credit receipts and Expenditure of Financial Institutions from 2009 to 2018

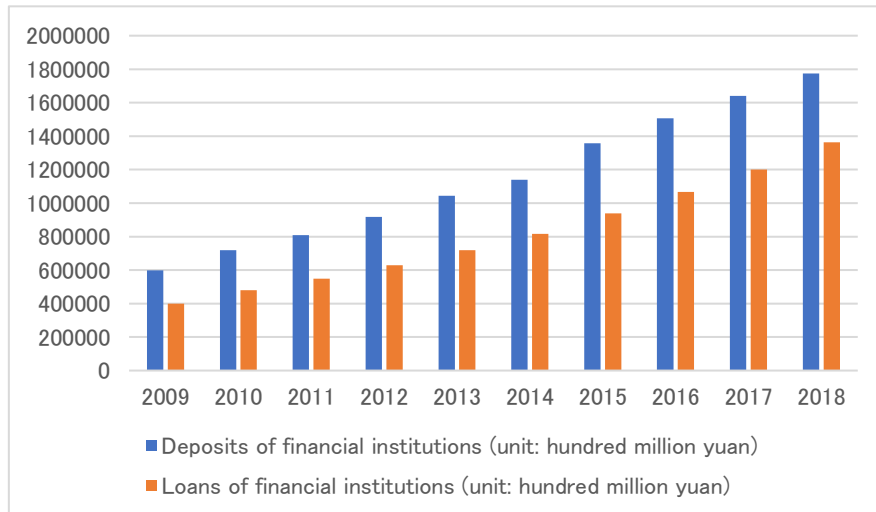


Figure 3-5 Statistics of disposable income and per capita consumption expenditure of residents from 2013 to 2017

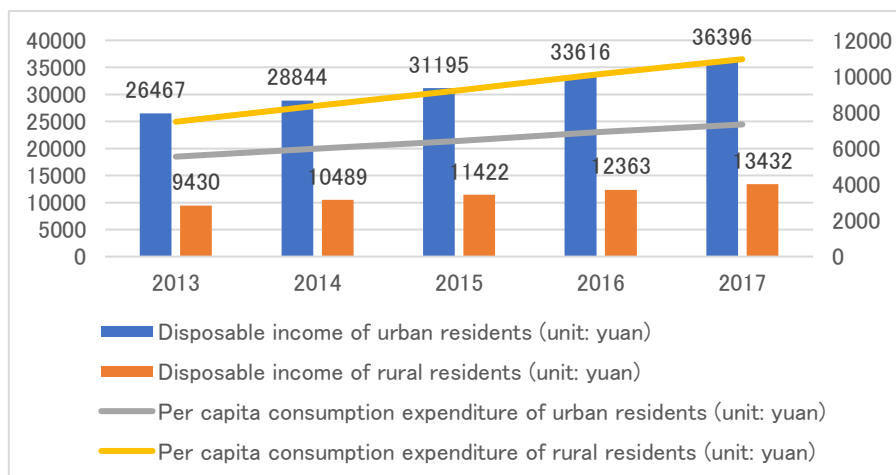
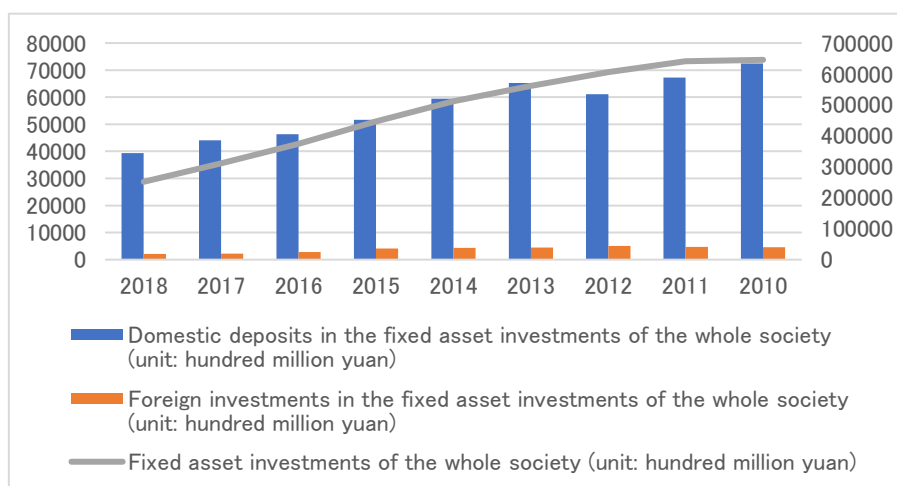


Figure 3-6 Fixed Assets of the Whole Society



(1) Scale expansion tends to maintain a moderate speed

Through nearly ten years of efforts, China has witnessed a dramatic expansion of scale with the great improvement of its economic strength. By the end of September 2014, the assets of China’s banking sector had exceeded 168 trillion RMB, six times more than the value of 2003, with annual average asset increase of over 15%.

Under the background of rapid expansion over years, China’s banking sector has ranked among the top of international finance industry in terms of scale for over thirty years. According to the ranking data of the 1000 major banks in the world as released by *The Banker*, a UK magazine, in July 2014, Industrial and Commercial Bank of China ranked again among the top 1000 banks with the Tier one capital of USD 207.614 billion and total assets of USD 3.1 trillion; and the average ranking of Industrial and Commercial Bank of China, Agricultural Bank of China, Bank of China and China Construction Bank rose from the 28th place in 2004 to the 5th place in 2014.

The scale expansion of China's banking sector has the following characteristics: first, bank asset and credit expansion is generally faster than the growth of GDP for the same period, reflecting the sustained capital demand in Chinese economy during the rapid growth of banks. Second, bank asset expansion has always been faster than credit expansion, showing the practical needs for rapid non-credit assets and other services in China's banking sector. Third, when considering the inflation of each year in the previous decade, with some special year excluded (2009), the asset growth of China's banking sector during such period is 4% higher than the total of the GDP growth and inflation rate on average and the credit growth is 1% higher than the total above accordingly. It is obvious that such a high growth rate cannot be maintained for long under the macro background of decelerated economic growth. Taking into account China's economic growth, inflation, capital utilization efficiency, social financing scale and other factors, it would be proper for the assets of China's banking sector to maintain a growth rate of 12% to 13% and bank loans to a growth rate of around 10% in the future. It can be said how to become stronger while having grown larger has become the pursuit of China's banking industry and scale has never been its ultimate goal.

(2) Revenue sources tend to be diversified

Currently, deposit-loan interest spreads, accounting to 60% to 70%, dominate in the revenue structure of China's banking sector and the rates of return on investments are maintained stable, at around 20%. Compared with

some leading international banks, Chinese banks have a smaller share of intermediate service revenues, with a percentage of 15% to 20%, which is closely correlated with the asset structure and interest regulation policies adopted in China's banking sector. The banking sector should further adjust its development strategy, change its development mode, resolutely abandon the development mode of depending much on deposit-loan interest spreads, vigorously explore business innovations and pursue real scientific development.

First, adjusting the development strategy. Chinese banks should rationally allocate assets from the perspective of corporate strategy, establish the asset and business structures that are suitable for their risk preferences and management capabilities, vigorously increase the share of non-credit assets and make efforts to improve the ability of the real economy of financial service. While adapting to the new trend of China's financial structure changes in recent years and maintaining the original refined credit market operation, the banking sector should actively get involved in loan market service and in multi-level capital markets construction, exploit the strengths of commercial banks in information, channel and goodwill and realize the transformation from credit intermediary to modern financial intermediary.

Second, revitalizing assets stock. In view of the pressure over the credit assets quality of banks under normal economic conditions, the management of commercial banks should focus on the changes of the traditional business model of held-to-maturity loan and actively revitalize financial assets stock

including credit loans, through credit asset transfer and asset securitization. Absorbing assets stock will become a regular service of banks so as to creating necessary conditions for asset restructuring.

Third, vigorously pursuing business innovation. In accordance with the principle of capital saving, the banking sector should make efforts to develop light capital-based business, and strengthen business governance and mechanism innovation. Especially, in order to adapt to the current urgent demand of residents for wealth management, the sector should, according to the divisional system principle, promptly carry out wealth management system reform, further make the asset management business larger and stronger, making it a new growth point for bank profits under economic new normal. The sector should study and refer to the characteristics of online finance and improve financial service under modern network conditions in an innovative way. Sampling survey indicates that 41.80% of Chinese small- and medium-sized enterprises felt hard to borrow loans from banks; 31.03% pretty hard and 27.79% extremely hard. In order to expand financial service areas, especially in case of insufficient service for small- and medium-sized enterprises as well as fields of agriculture, countryside and farmers, the sector should separately formulate credit plans, the business flow that is suitable for business development as well as characteristic assessment incentive mechanism, etc., and strengthen the efforts to configure credit resources.

Fourth, Promoting normal comprehensive operation. By referring to

international experience and controlling risks, the banking sector should encourage satisfactory banking institutions to select their market orientations and business models according to their characters, strengthen the administration and regulation of consolidated financial statements, actively and stably develop financial leasing, insurance, investment banking, pension management and other businesses, and realize the normal comprehensive operation of banks, thus realizing the diversification of banks' revenue sources.

(3) Profitability tends to be stable and the remuneration system reasonable

The banking sector has witnessed a rapid growth of profitability and high level of asset profitability in recent years. During the five years before 2012 (except the year 2009), the profit growth of China's banking sector exceeded 30%. In 2012, the profit growth slightly decreased, to 20%. In 2013, despite the fact that the profit growth decreased to 15.7%, the post-tax profits of 1.74 trillion RMB were still created. The profitability of the banking sector cannot be matched by other sectors of national economy. In 2013, there were more than 2,500 listed companies at Shanghai and Shenzhen Stock Exchanges. The total net profits of these companies reached 2.26 trillion RMB. Among them, 16 listed commercial banks contributed to more than half of the profits, amounting to 1.15 trillion RMB. With the acceleration of the interest rate marketization, China's banking industry will witness a further trend of narrowed interest rate, great pressure of profitability and prominent trend of decelerated profitability.

Under the new normal of economy, the profitability of China's banking sector will remain to witness a sustained growth but obvious deceleration of growth and maintain a stable level. Now, it appears reasonable for China's banking sector to maintain a profit growth of around 10%. Such growth cannot only guarantee the banking sector to gain the momentum of sustained development but also guide social resources to reasonably flow among different sectors and improve the overall efficiency of social resources without excessively compromising the profits of real economy.

(4) Risk handling tends to be normal

Financial risks are always followed by the development of banking service. Both the risks of a single financial institution and the risks of the whole financial system are the due meanings of market economy. Both managers and regulators of banks must regard the prevention and control of financial risks as priorities. The operation failures of Chinese financial institutions are not commonly seen; anyhow, several risk events that have caused major impacts have occurred, such as bankruptcy of Hainan Development Bank in 1995 and reorganizing of Guangdong International Trust & Investment Corporation. These events caused impacts to the financial order and stability then. At that time, due to the lack of support such as legal aspect, the risk handling and market exit of some financial institutions have not completely ended.

In order to adapt to the new normal of economic growth, it is also urgent to

establish a normal financial risk handling mechanism. An effective financial risk handling mechanism shall be firstly built in commercial banks. As the first person responsible for financial risk handling, the commercial bank should make efforts to improve corporate governance mechanism and strengthen internal control. The Board of Directors and executive officers should establish risk monitoring and daily handling procedures inside the commercial bank. Also, there shall be sufficient provision of risks and perfect capital supplementation channels and mechanism arrangements. The commercial bank should also formulate specific feasible service resumption plans and ensure itself operate business in a robust way at any time. Currently, Bank of China, Industrial and Commercial Bank of China and Agricultural Bank of China, as important financial institutions in the world, are formulating their service resumption and risk handling plans. Other commercial banks, especially national joint-stock banks, should also formulate their plans. Also, in the institutional design of private banks, China proposed the requirements for shareholders to bear risks on their own. That is also the normal system arrangement for handling single financial risks.

The government should have normal financial risk handling laws and institutional arrangements. It should mainly formulate the bankruptcy laws for financial institutions including commercial banks and identify the legal basis, operating procedures, legal responsibilities and other specifications for exit of commercial banks from the market. Financial regulation

authorities should establish a set of risk handling procedures, plans and policy tools regarding risks of single financial institutions to regional and systematic financial risks in order to ensure the financial institutions undergoing business failures to exit from the financial market in an orderly manner. To this end, it is necessary to establish and improve the financial risk handling mechanism within the prudent macro regulation policy framework, identify the functions and roles of the central bank and other financial regulation authorities in financial risk handling, and strengthen the coordination system arrangements for risk handling.

The ultimate goal of risk handling is to ensure the stability of the entire financial system. It should be emphasized that the principle adopted by the government when handling financial risks is not to ensure each commercial bank operates well. So, that cannot absolutely prevent any institution from bankruptcy but ensures the vitality and stability of the whole financial system through the market-based mechanism of survival of the fittest. For such purpose, one important task at present is to speed up financial infrastructure building, accelerate the building of a deposit insurance system that conforms to the reality of China's banking sector, essentially protect the legal rights and benefits of depositors and provide support and guarantee for the orderly exit of financial institutions.

(5) Financial regulation tends to be stricter

Under the new economic and financial situation, the financial regulation

concepts, standards and priorities, etc. should be adjusted accordingly. The adjustments are mainly reflected in the following aspects:

First, stricter regulation standards or much stricter regulatory requirements. Since the international financial crisis in 2008, the international financial regulation organizations have formulated a series of standards and measures on enhanced capital regulation, fluidity regulation, leverage rate regulation, corporate governance regulation and remuneration regulation, which has played a vital role in maintaining the stability of the banking sector. China's banking regulation authorities are revising and perfecting China's bank regulation rules and greatly improving the standards for domestic bank regulation according to the new trend and requirements of international banks regulation. Under the increasingly strict regulation pressure, the space for regulatory arbitrage will be further narrowed; the violation costs of financial institutions will continue to increase; and compliant business operation and legal regulation will become the new normal in the development of the financial sector.

Second, focusing on regulatory resources, i.e. placing regulatory focuses and resources on important banks within the system. Currently, China's four major state-owned commercial banks all rank among the top 10 banks in terms of market value. Among them, Bank of China, Industrial and Commercial Bank of China and Agricultural Bank of China remain important financial institutions in the global system. The new regulatory rules have intensified the regulation efforts on important banks of the system, made the

business scope limitation on these important banks more specific, increased the frequency of site inspections, intensified the efforts of punishment and obviously increased the requirements for transparency of financial activities. It is required to promote the risk handling mechanism building for important banks in the system, deepen the cooperation and exchanges on international regulation, and intensify the information sharing and regulatory policy coordination with host countries.

Third, making regulation access simple or simplifying the administrative license procedures in terms of bank regulation. For long, China's banking sector has been strictly regulated. The regulatory authorities have adopted strict control on new banking institutions. Few financial institutions in the banking sector have emerged and the banking market is relatively insufficient in competition landscape. As the products of major institutional innovation, the emergence of private banks in 2014 once made the market see the possibility for increased competition. However, private banks remain to stay in the pilot stage. It is hard for private banks to satisfy market needs in terms of both quantity and scale. It was proposed at the third Plenary Session of the 18th CPC Central Committee that the market should play a decisive role in the allocation of resources. When it comes to financial regulation, it is necessary to reasonably control the scale and pace of market access and convey to the market clear competition signals. With prudent regulation (such as strict capital liquidity requirements), the access criteria for financial institutions and market should be further relaxed. The pace for

proper control of reviewing and approving new institutions should be moderately controlled when the applications from new institutions are accepted. Relevant authorities should make the channels for the entry of new institutions (including private and foreign banks, non-banking institutions) into financial systems smooth, properly increase the number of new financial institutions and promote the moderate competition of financial system with the entry of new institutions as aid. Also, these authorities should further play the role of the government in controlling financial institutions and policy banks, play the role of industry guidance and demonstration when regulating financial competitions through the provision of standard business management activities and the provision of comparatively low interest rate, further exhibit market vitality, fully exploit the due functions of allocated resources in the market and make greater orderly competitions a new normal for the banking market patterns.

Fourth, pursuing identical regulation service or increasing the awareness of functional regulation. For a long time, institutional regulation has always the mainline of China's financial regulation and played an important role in facilitating the development of banks and maintaining financial stability. In recent years, the trend of homogenous structure competition in China's financial sector has been enhanced. Objectively, it is required that the financial regulation authorities should strengthen functional regulation while following the framework of institutional regulation, propose identical regulation standards and requirements for the identical and homogenous

business conducted by different financial institutions so as to avoid arbitrage in regulation and maintain fair competitions in the financial sector. Since 2013, the financial regulation authorities have fulfilled a lot of effective tasks in preventing China's shadow banking risks, regulating inter-bank business and wealth management service, etc, which has made a great success and set a good sample for intensified functional regulation. Under the new normal of economy, financial institutions will continuously explore comprehensive business operation and obviously strengthen the overlapping, cross-sector and cross-market of financial business. The competitions among different financial patterns will be intensified. In view of the new trends and new characters of finance development, financial regulation authorities are required to take more concerted actions to strengthen functional regulation.

(6) Internet finance has gained a rapid development and commercial banks witnessed a weak growth of traditional deposits

Since the adoption of reform and opening up in China, China has witnessed a rapid economic growth, continuously innovated science and technology, accelerated social progress and sustained cultural prosperity. Following the rapid popularization of internet and fast growth of big data, e-commerce has also started to grow rapidly, thus facilitating the rapid growth of third-party payment platform. The rapid development of third-party payment platform is just the start of the vigorous development of China's internet finance. Especially, after Baifafund, Yu'e Bao, Great Wall Securities, Tenpay, WeChat Pay, online brokers and other products were launched, the internet finance

has taken on a trend of vigorous development. Internet finance has continuously transformed financial market with its unique channels and products and penetrated into traditional financial industry. While providing more and more financial services, it has also strengthened the competitions between itself and commercial banks. In 2013, Alipay's Yu'e Bao money fund products became popular. While awakening the wealth management awareness of the public, the products also promoted the development of various online finance platforms and enterprises. Just since then, China's P2P online lending business has just started to expand rapidly. Under the popular and rapidly developing internet finance model, China's commercial banks are facing larger and larger pressure of deposit growth; internet finance is occupying an increasingly larger market share; and the market share occupied by commercial banks is gradually decreasing. Due to the sharing of profits by internet finance, commercial banks may be likely to greatly cut their business scale.

According to the statistical data, from January to September, 2017, the total deposits of the four major state-owned banks, namely Industrial and Commercial Bank of China, Agricultural Bank of China, Bank of China, China Construction Bank, increased by 4.8 trillion RMB, down by one trillion RMB compared to the same period of the previous year; the total deposits of eight major listed joint-stock banks had an increase of only 218.2 trillion RMB, down by more than 700 billion RMB compared to the same period of the previous year. And there was a tendency for the deceleration

of further growth. Behind the slowed growth of deposits in commercial banks is the lowered debt capacity of commercial banks. The fact has constrained the capital and strength required by commercial banks in order to develop their business and caused adverse effect on their long-term sustainable development.

(7) Interest rate liberation is basically completed and the deposit-loan interest spreads of commercial banks continue to be narrowed

Commercial banks are faced with an ever-changing interest rate market in their development process. Commercial banks should adjust their loan interest rate according to the actual deposit costs so as to maintain their deficit within a stable range. During the actual lending process, only high-risk enterprises are willing to pay high loan interest in general cases. Thus, the loan interest rate of the enterprises that operate well is lower than that of the enterprises that operate poorly. That means, if commercial banks treat all clients equal, quality clients will gradually decrease under unequal contracts. Increasing high-risk enterprises will cause the gradual increase in the operating risks of commercial banks, thus seriously impacting the targeted selection of commercial banks. Additionally, due to the impact of new normal of economy, united credit cooperatives, regional urban commercial banks, nationwide joint-stock banks and internationalized large-scale banks, etc. appear in the banking sector. Under the current situation that price dominates in competitions, commercial banks will face fiercer peer competitions. Of course, the diversified growth of private banks and

non-banking financial institutions also aggravates the competitions among commercial banks.

Interest rate market reform is a key link and important achievement of China's financial system reform. As early as 2015, the People's Bank of China announced the loosening of the floating ceiling of deposit interest rates, which marked the completion of China's interest rate liberation. Such liberation will undoubtedly increase the interest rate fluctuation in China. More importantly, the one-year time deposit interest rate of China is about 200 basis points lower than the one-year Shibor (Shanghai Interbank Offered Rate). The situation has continued in China for years. Thus, after interest rate liberation, Chinese commercial banks will inevitably face even higher pressure of increase, which will surely cause the decrease in deposit-loan spreads. For long, Chinese commercial banks can still maintain a rapid growth in revenues and profit growth in the context of low service quality and weak business innovation capability. The reason just lies in the high saving rate of Chinese residents. Commercial banks may maintain their survival depending on a large amount of deposit-loan interest spreads. Thus, commercial banks are called by the public to be able to "make money by lying down." There is no doubt that excessive reliance on deposit-loan interest spreads will not continue, which indirectly shows the insufficient comprehensive management level and risk control ability of Chinese commercial banks. The impacts of the current interest rate market to the deposit-loan interest spreads of commercial banks conform to the

development laws of market economy and represent an important reason for the further transformation and development of commercial banks.

(8) The opening-up of capital markets is accelerated and commercial banks face increasing business competitions

Opening-up represents an important drive and key support for the development of national economy. With the further acceleration of economic globalization, the opening-up of the Chinese capital markets in the future will become a necessity. The inclusion of some constituents in China's A-share market is a typical representative. After the convening of the 19th CPC National Congress, the regulatory authorities clearly stated that China would relax the equity ratio of single or several foreign investors to 51% when they make direct or indirect investments in securities, fund management and futures companies. After the implementation of these measures for three years, the equity ratio was not restricted. It shows that the opening-up of China's capital markets will be further accelerated. The opening-up of capital markets will cause impacts on the existing patterns of Chinese commercial banks: first, the entry of non-banking financial institutions will further increase the difficulty of commercial banks in increasing deposits and commercial banks' pressure in deposit-loan interest spreads will further increase; second, the leading management concepts, risk control capability and excellent customer service ability of international banks will divert new and existing clients of commercial banks, which is not conducive to the feasible development of commercial banks; third, international commercial

banks appear more experienced in investment banking and cross-border business, which will undoubtedly form an invisible constraint on the internationalization of Chinese commercial banks. Commercial banks' pressure in business competition will increase.

Additionally, capital markets and economic systems develop and become perfect during the rapid economic growth, which provides better development conditions and prospect for the development of brick-and-mortar enterprises. With the continuous improvement of the financial derivatives, futures, stocks and bond development systems, investors may bypass commercial banks through various means.

4. Comparisons between State-owned and Non-State-owned Commercial Banks in Performance

4.1 Relevant Theoretical Definition and Index Description

4.1.1 The Concept of Bank Performance

The bank's operating performance refers to the bank's operating efficiency and operator's performance during a certain period of operation.⁶¹ It mainly refers to the comprehensive evaluation and analysis results of all input-output items. It is mainly reflected in profitability, asset operation level, follow-up development ability and other aspects, and is a direct

⁶¹ Guan Xinhong. The method of Bank Performance Evaluation Based on Risk [J]. Journal of Central University of Finance and Economics, 2004 (05): 26-30.

manifestation of the bank's comprehensive competitiveness. This article will make an overall evaluation of the bank's operating performance from the four aspects of the commercial bank's asset scale, profitability, safety and capital flow capacity. The asset scale evaluation includes total amount of assets and total number of employees. Profitability is mainly measured from the dimensions of operating income, total amount of costs, cost-benefit ratio, etc. Capital flow capacity indicators include: loan-to-deposit ratio, asset-liability ratio and other data.

4.1.2 Selection of Samples

The structure of China's banking industry can be divided into state-controlled commercial banks and non-state-controlled commercial banks in terms of capital nature. Among them, the state-controlled commercial banks are the main operators of China's banking industry.

In the third part of the performance analysis and comparison between China's state-owned commercial banks and non-state-owned commercial banks, the research sample of this paper selects commercial banks with the highest capital amount and complete data disclosure. The research sample includes five state-owned commercial banks: Industrial and Commercial Bank of China, Agricultural Bank of China, Bank of China, China Construction Bank and Bank of Communications. There are altogether 7 non-state-owned commercial banks, including China Merchants Bank, Pudong Development Bank, China CITIC Bank, China Everbright Bank, Huaxia Bank, China

Minsheng Bank and Ping An Bank.

4.1.3 Data Sources

The data sources of this paper are as follows: 1. CSMAR database: <http://cndata.csmar.com/>. It is an economic and financial database developed by drawing on the professional standards of international well-known databases such as CRSP of the University of Chicago, Standard & Poor's Compustat, New York Stock Exchange TAQ, I/B/E/S, Thomson, and combining with the actual conditions of China. 2. China Financial Yearbook-the Chinese edition was founded in 1986. It is an authoritative, professional, continuous and scientific yearbook reference book, which faithfully records the course of the reform and development of contemporary China's financial industry with rich content and detailed data. 3. Some data come from the relevant financial data disclosed in the annual reports of sample banks. 4. Genius Database: <http://www.genius.com.cn/geniusData.html>. It is a database with modern standards that took 20 years to forge. Database products not only have reasonable design specifications and structures, but also contain rich content, complete historical data and excellent data quality. It enjoys high reputation and good public praise among its customer groups and similar industries. 5. Moody's Analytics BankFocus: findabank.bvdinfo.com. It is a global bank and financial institution analysis library. It has unique achievements in the financial and banking sectors, combines the core data of Bureau van Dijk and Moody's Investor Services, and provides detailed, standardized reports and professional ratios of more

than 44,000 banks worldwide through its professional data collection and arrangement capabilities.

4.1.4 Establishment of Performance Evaluation System for Commercial Banks

4.1.4.1 Principles for Establishing Performance Evaluation System of Commercial Banks

Based on the research purpose, this paper makes an overall evaluation on the performance of commercial banks, which mainly includes: scale strength, profitability, capital security, and capital flow capacity. As there are many evaluation dimensions, in order to obtain objective, reasonable and effective evaluation results, the following principles should be followed in the construction of the performance evaluation system:

I. Scientific principle. The evaluation system established should objectively reflect the performance of commercial banks, and the selected indicators should be standardized and reasonable, with accurate definitions and calculation methods to avoid conceptual duplication and statistical correlation between the selected indicators.

II. Principle of comparability. The construction of this evaluation system is to provide theoretical and data support for the performance analysis of state-owned commercial banks and national joint-stock commercial banks. Therefore, the selection of indicators and the

restriction of scope should be consistent to avoid the difference of results caused by different time ranges, different indicators and calculation methods. The selection range of time variables in this paper is from 2007 to 2018.

III. The principle of availability. All data in the constructed evaluation system must be available to avoid evaluation failure caused by data missing. At the same time, the data sources should be authoritative and authentic to ensure the authenticity and reliability of the evaluation results. The research objects selected in this paper are all listed joint-stock commercial banks, so the data sources of the research objects in this paper are consistent, true and reliable.

IV. The principle of combining quantity with quality. As the management of commercial banks in China tends to be diversified, most of the evaluation systems constructed in this paper can be evaluated through quantitative indicators, but a small number of management indicators can only be obtained through qualitative analysis. In establishing the evaluation system, the objective index is better than the subjective description, while ensuring that the qualitative index is clear, objective and reasonable.

V. Principle of timeliness. As the financial environment and corresponding policies at different stages will have unpredictable impacts on the development of commercial banks, the data and indicators

of the evaluation system in this paper should be timely, and the irrelevant data and invalid old data should be eliminated.

4.1.4.2 Establishment of Performance Evaluation System for Commercial Banks

Based on the mature research results of domestic and foreign scholars on the performance evaluation system of commercial banks and the operating characteristics of commercial banks, this paper divides the performance evaluation of China's state-owned commercial banks and national joint-stock commercial banks into two first-class indexes, namely, the current operating ability evaluation and the development ability evaluation. The current operating ability evaluation includes five first-class indexes, namely, scale strength, profitability, safety ability, capital flow ability and sustainable development ability. See the following table for details:

Table 4-1 The current operating ability evaluation

| Primary indicator | Secondary index |
|-------------------|------------------------|
| Strength of scale | Total amount of assets |
| | Number of employees |
| Profitability | Operating income |
| | Return on Total Assets |
| | Return on assets (ROA) |
| | Operating Costs |
| | Cost-income ratio |
| Safety capability | Capital adequacy ratio |

| | |
|-----------------------|----------------------------|
| | Non-performing loan ratio |
| | provision coverage |
| Capital flow capacity | Loan-to-deposit ratio rate |
| | Asset-liability ratio |

4.1.5 Description of Relevant Indicators

As an important role of the banking industry, commercial banks play an important leverage role in China's economic development. They are the main body directly participating in market economic activities and have made an important basic guarantee for China's economic development. This paper mainly makes an overall evaluation from the four dimensions of commercial banks' scale strength, profitability, capital security and liquidity health. The selected indicators are as follows:

(1) Analysis of Scale Strength Index

Total amount of Assets: refers to the total assets in the bank's balance sheet. This indicator reflects the bank's financial status and solvency. The larger the amount of this indicator, the larger the total assets and the larger the scale of operation, and the market reputation and position are also positively correlated with the impact of this indicator.

Number of employees: The number of employees is the terminal resource for commercial banks to provide services to users, which proves the market

position and market share. This paper will assume that the bank's staffing is reasonable, and the number of bank employees is positively related to the bank's size.

(2) Analysis of Profitability Index

Operating income: Operating income of commercial banks refers to the sum of interest, interest spread subsidy, handling fee and spread earned by commercial banks from lending, settlement, leasing, trust investment, securities trading, real estate development, gold and silver, foreign exchange, and securities trading. Business income is closely related to the business activities of commercial banks. It reflects the content and scale of business activities of commercial banks.

Return on Total Assets: refers to the level of return on all assets of commercial banks and is an important indicator to measure the profitability of commercial banks. The return on assets is positively related to the ability to utilize assets. The calculation method is: $\text{Return on Total Assets} = (\text{net profit} + \text{interest expense} + \text{income tax}) / \text{average total assets} * 100\%$

Return on assets (ROA): The ratio of a bank's net profit to its average total assets in a certain period of time. The higher the net profit rate of assets, the stronger the profitability of the bank to use all its assets. The lower the net profit rate of assets, the weaker the bank's profitability of using all assets.

Operating Costs: bank operating costs are all expenses incurred by banks

in operating financial services, which are the main components of bank costs.

Cost-income ratio: refers to the ratio of operating costs plus depreciation to operating income, and the cost-income ratio should not be higher than 45%.

(3) Capital Security Capability Index

Capital adequacy ratio: refers to the risk ratio weighted by the capital of commercial banks, and is an important indicator to measure the capital safety of commercial banks. The higher the capital adequacy ratio of a commercial bank, the greater its ability to bear the risk of default assets and the smaller its capital risk. The calculation method is: capital/weighted risk assets

Non-performing loan ratio: refers to the proportion of non-performing loans of financial institutions in the total loan balance. Non-performing loans refer to the five categories of normal, concerned, secondary, doubtful and loss according to the risk basis when evaluating the quality of bank loans, of which the latter three categories are collectively called non-performing loans. The high rate of non-performing loans indicates that the proportion of loans that may not be recovered in the total loans is larger. The low rate of non-performing loans indicates that the proportion of loans that financial institutions cannot recover in total loans is smaller. The calculation method is: non-performing loan ratio = (sub-prime loan+doubtful loan+loss loan)/loans ×100%

Provision coverage rate: that is the ratio of loan loss reserve to non-performing loans, is a reserve used to offset the possible stagnant bad debts of commercial banks, and can measure whether the reserve is sufficient and can effectively deal with the risks of operation and management. Loan loss reserve is the reserve made to cover losses when there is objective evidence that the loan is likely to be impaired. The higher the index, the stronger the ability to resist risks. This index cannot be lower than 100%, otherwise there will be a reserve gap and insufficient provision. The calculation method is:

$$\text{provision coverage} = \frac{(\text{general reserve} + \text{special reserve} + \text{special reserve})}{(\text{sub-prime loan} + \text{doubtful loan} + \text{loss loan})} \times 100\%$$

(4) Capital Flow Capacity Index

Loan-to-deposit ratio rate: The ratio of total bank loans to total deposits, which can be used to measure the liquidity of bank funds from side. The calculation method is: total bank loan/total deposit $\times 100\%$

Asset-liability ratio: is the ratio of total liabilities to total assets, which can measure the ability of commercial banks to use the funds provided by creditors to carry out business activities, as well as an index reflecting the degree of security of creditors in issuing loans. The larger the index is, the higher the risk of creditors suffering losses. Generally speaking, the asset-liability ratio of 40%~60% is considered to be the appropriate level. The calculation method is: asset-liability ratio = total liabilities/total assets $\times 100\%$

4.2 Performance Comparison between Large State-owned Commercial Banks and Private Commercial Banks in China

4.2.1 Ownership Structure of Commercial Banks Affects Operating Performance

Equity is the shareholder's investment share in commercial banks. The size of the equity ratio directly affects the right of shareholders to speak and control the company, and is also the basis for the dividend ratio of shareholders. If the ownership structure is the foundation of the corporate governance structure, the corporate governance structure is the concrete operating and management embodiment of the ownership structure. Different ownership structures determine the organizational structure of the enterprise, thus determining the performance of the corporate governance structure and ultimately affecting the behavior and performance of the enterprise.⁶²

There are essential differences between state-owned commercial banks and private commercial banks in ownership. According to the difference between the investment subject and the property right management subject, it can be divided into state-owned shares, legal person shares and tradable shares.⁶³ Among them, the state-owned shares are divided into state shares and state-owned legal person shares. State shares refer to shares that are formed or

⁶² Shi Ruiqing. The Impact of Corporate Control Market Mechanism on the Internal Governance of Chinese Commercial Banks [D]. Graduate School of the Chinese Academy of Social Sciences, 2012.

⁶³ Fang Li. Research on the correlation between the equity structure and corporate performance of listed companies [D]. Beijing University of Posts and Telecommunications, 2013.

acquired through legal procedures by institutions or departments that have the right to invest on behalf of the state. The state-owned legal person shares refer to the shares that state-owned enterprises, institutions and other units with legal person status have formed or acquired according to legal procedures by contributing their legal person assets to a joint-stock company independent of themselves. Legal person shares are divided into domestic non-state-owned legal person shares and overseas legal person shares, which are distinguished from state-owned legal person shares. Domestic non-state-owned legal person shares represent the shares formed by non-state-owned enterprises and institutions with legal person status investing in the company. Overseas legal person shares represent the shares formed by overseas legal persons participating in domestic joint-stock companies. Tradeable shares are the shares that can be circulated in the stock market.

4.2.1.1 Ownership concentration

Ownership concentration is a quantitative index to measure the distribution of ownership. Generally, it can be divided into several types: highly concentrated ownership concentration, highly dispersed ownership concentration, relatively concentrated ownership concentration and relatively dispersed ownership concentration. There is an absolute controlling shareholder in the highly concentrated type, and the controlling shareholder holds more than 50% of the shares. In addition, most of the remaining shares are shared by only a few shareholders, and the number of shareholders is limited. On the contrary, there is no absolute controlling

shareholder in the highly dispersed type of shares. The controlling proportion of the first largest shareholder shall not exceed 20%. In addition, the remaining shares shall be shared by a certain number of shareholders, and the controlling proportion of each shareholder shall not exceed 10%. In this case, the role played by each shareholder is not significant. The types of relatively concentrated equity and relatively dispersed equity are between the above two types, and there may be several major shareholders, but the shareholding ratio of the first major shareholder is required to be controlled between 20% and 50%.

As can be seen from the following table, the state-owned commercial banks have a high concentration of shares, all of which are state-owned shares, in sharp contrast to private banks. The largest shareholders of Industrial and Commercial Bank, China Construction Bank, Agricultural Bank of China and China Construction Bank are all Central Huijin Investment Ltd., which holds a large equity.

Central Huijin Investment Ltd.⁶⁴ (hereinafter referred to as "Central Huijin Company") is a solely state-owned company funded by the state in accordance with the *Company Law of the People's Republic of China*. Central Huijin Company was established in Beijing in December 2003 with a registered capital of 45 billion US dollars. The aim is to exercise the rights and obligations of investors of state-owned commercial banks and other key

⁶⁴Source: official website of Central Huijin Investment Ltd. http://www.Huijin-inv.cn/Huijin-inv/About_Us/index.shtml

financial enterprises on behalf of the state in accordance with the law. The State Council shall exercise the important shareholder duties of the Central Huijin Company. Members of the board of directors and the board of supervisors of the Central Huijin Company shall be appointed by the State Council and shall be responsible to the State Council. In December 2003, the Central Huijin Company injected 22.5 billion US dollars into the Bank of China and China Construction Bank respectively, and pushed Bank of China and China Construction Bank to carry out joint-stock system reform, introduce strategic investors and improve corporate governance. In April 2005, the Central Huijin Company injected 15 billion US dollars into the Industrial and Commercial Bank of China, and promoted the Bank to carry out shareholding system reform, introduce strategic investors and improve corporate governance. In November 2007, the Central Huijin Company injected RMB 20 billion equivalent US dollars into China Everbright Bank and promoted the reform of China Everbright Bank and China Everbright Group. In October 2008, the Central Huijin Company injected RMB130 billion equivalent US dollars into the Agricultural Bank of China, and promoted the Agricultural Bank of China to carry out shareholding system reform, introduce strategic investors and improve corporate governance. During the statistical period of sample data, i. e. 2007-2018, the top three shareholders of state-owned commercial banks have no substantial changes and their holding shares have no obvious changes. In the change of the top three shareholders of non-state-owned commercial banks, except Ping An Bank, the top three shareholders have no obvious change. Ping An Bank,

formerly known as Shenzhen Commercial Bank, is the first joint-stock commercial bank in China and the first listed commercial bank in China. Since 2006, Ping An Insurance Group has gradually held shares in Shenzhen's commercial banks through private placement and acquisition. By the end of 2006, Ping An Insurance Group had held a total of 4.917 billion shares in Shenzhen's commercial banks, accounting for 89.36% of the total share capital of Shenzhen's Commercial Banks.

Table 4-2 Top 3 Shareholders and Their Shares of Sample Banks from 2007 to 2018 (In %)

| | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|-------------------------|---|-----------------------------------|--------|-----------------------------------|--------|---|--------|---|--------|---|--------|---|--------|---------------------------------------|--------|---|--------|---|--------|---|--------|---|--------|--|--------|
| | | Shareholders | Shares | Shareholders | Shares | Shareholders | Shares | Shareholders | Shares | Shareholders | Shares | Shareholders | Shares | Shareholders | Shares | Shareholders | Shares | Shareholders | Shares | Shareholders | Shares | Shareholders | Shares | Shareholders | Shares |
| State-owned | Industrial and Commercial Bank of China | Ministry of Finance | 35.3 | Huijin Company | 35.4 | Huijin Company | 35.4 | Central Huijin | 35.4 | Central Huijin | 35.4 | Central Huijin | 35.4 | Huijin Company | 35.3 | Central Huijin | 35.1 | Central Huijin | 34.7 | Central Huijin | 34.7 | Central Huijin | 34.7 | Central Huijin | 34.7 |
| | | Huijin Company | 35.3 | Ministry of Finance | 35.3 | Ministry of Finance | 35.3 | The Ministry of Finance of the People's Republic of China | 35.3 | The Ministry of Finance of the People's Republic of China | 35.3 | The Ministry of Finance of the People's Republic of China | 35.2 | Ministry of Finance | 35.0 | The Ministry of Finance of the People's Republic of China | 34.8 | The Ministry of Finance of the People's Republic of China | 34.6 | The Ministry of Finance of the People's Republic of China | 34.6 | The Ministry of Finance of the People's Republic of China | 34.6 | Ministry of Finance | 34.6 |
| | | HKSCC | 13.1 | HKSCC | 13.2 | HKSCC | 16.3 | HKSCC | 24.5 | HKSCC | 24.6 | HKSCC | 24.6 | HKSCC | 24.4 | HKSCC | 24.5 | HKSCC | 24.2 | HKSCC | 24.2 | HKSCC | 24.2 | HKSCC | 24.1 |
| China Construction Bank | China Construction Bank | Central Huijin | 59.1 | Huijin Company | 48.2 | Huijin Company | 57.0 | Central Huijin | 57.0 | Central Huijin | 57.1 | Central Huijin | 57.2 | Central Huijin | 57.2 | Central Huijin | 57.2 | Central Huijin | 57.3 | Central Huijin | 57.1 | Central Huijin | 57.1 | Central Huijin | 57.1 |
| | | HKSCC Nominees Limited | 12.07 | Bank of America | 19.1 | HKSCC Nominees Limited | 19.1 | HKSCC Nominees Limited | 19.7 | HKSCC Nominees Limited | 24.88 | HKSCC Nominees Limited | 28.22 | HKSCC Nominees Limited | 29.04 | HKSCC Nominees Limited | 30.46 | HKSCC Nominees Limited | 30.93 | HKSCC Nominees Limited | 36.7 | HKSCC Nominees Limited | 36.7 | HKSCC Nominees Limited | 36.79 |
| | | China Construction Investment | 8.85 | HKSCC Nominees Limited | 12.5 | Bank of America | 10.9 | Bank of America Corporation | 10.2 | Temasek Holdings | 9.06 | Temasek Holdings | 7.15 | Temasek Holdings | 7.15 | Temasek Holdings | 5.79 | Temasek Holdings | 5.77 | China Securities Finance Corporation Limited | 1.03 | China Securities Finance Corporation Limited | 1.07 | China Securities Finance Corporation Limited | 0.88 |
| Bank of China | Bank of China | Central Huijin | 67.4 | Central Huijin | 67.5 | Central Huijin | 67.5 | Central Huijin | 67.5 | Central Huijin | 67.6 | Central Huijin | 67.7 | Central Huijin | 67.7 | Central Huijin | 65.5 | Central Huijin | 64.0 | Central Huijin | 64.0 | Central Huijin | 64.0 | Central Huijin | 64.0 |
| | | HKSCC Nominees Limited | 12.1 | HKSCC Nominees Limited | 12.2 | HKSCC Nominees Limited | 24.6 | HKSCC Nominees Limited | 28.1 | HKSCC Nominees Limited | 29.1 | HKSCC Nominees Limited | 29.2 | HKSCC Nominees Limited | 29.2 | HKSCC Nominees Limited | 28.2 | HKSCC Nominees Limited | 27.7 | HKSCC Nominees Limited | 27.7 | HKSCC Nominees Limited | 27.8 | HKSCC Nominees Limited | 27.8 |
| | | RBS China Investments S. à. r. l. | 8.25 | RBS China Investments S. à. r. l. | 8.25 | National Council for Social Security Fund | 3.3 | Li Ka Shing | 1.01 | The Bank of Tokyo-Mitsubishi UFJ Ltd. | 0.19 | The Bank of Tokyo-Mitsubishi UFJ Ltd. | 0.19 | The Bank of Tokyo-Mitsubishi UFJ Ltd. | 0.19 | The Bank of Tokyo-Mitsubishi UFJ Ltd. | 0.18 | China Securities Finance Corporation Limited | 2.53 | China Securities Finance Corporation Limited | 2.58 | China Securities Finance Corporation Limited | 2.74 | China Securities Finance Corporation Limited | 2.92 |
| | | | | | | | | Central Huijin | 40.0 | Central Huijin | 40.1 | Central Huijin | 40.2 | Central Huijin | 40.2 | Central Huijin | 40.2 | Central Huijin | 40.0 | Central Huijin | 40.0 | Central Huijin | 40.0 | Central Huijin | 40.0 |

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|-----------------|----------------------------|---|-------|---|-------|---|------------------------|--|---|---|---|---|---|---|---|--|---|--|---|--|---|--|-------|
| | Agricultural Bank of China | | | | | | Ministry of Finance | 39.21 | The Ministry of Finance of the People's Republic of China | 39.21 | The Ministry of Finance of the People's Republic of China | 39.21 | The Ministry of Finance of the People's Republic of China | 39.21 | The Ministry of Finance of the People's Republic of China | 39.21 | The Ministry of Finance of the People's Republic of China | 39.21 | The Ministry of Finance of the People's Republic of China | 39.21 | The Ministry of Finance of the People's Republic of China | 39.21 | |
| | | | | | | | HKSCC Nominees Limited | 8.89 | HKSCC Nominees Limited | 8.99 | HKSCC Nominees Limited | 8.99 | HKSCC Nominees Limited | 9.04 | HKSCC Nominees Limited | 9.04 | HKSCC Nominees Limited | 9.03 | HKSCC Nominees Limited | 9.03 | HKSCC Nominees Limited | 8.73 | |
| | | HKSCC Nominees Limited | 22.02 | Ministry of Finance | 26.48 | Ministry of Finance | 26.48 | Ministry of Finance | 26.52 | Ministry of Finance | 26.53 | The Ministry of Finance of the People's Republic of China | 26.53 | The Ministry of Finance of the People's Republic of China | 26.53 | The Ministry of Finance of the People's Republic of China | 26.53 | The Ministry of Finance of the People's Republic of China | 26.53 | The Ministry of Finance of the People's Republic of China | 26.53 | The Ministry of Finance of the People's Republic of China | 26.53 |
| | Bank of Communications | The Ministry of Finance of the People's Republic of China | 20.36 | HKSCC Nominees Limited | 21.94 | HKSCC Nominees Limited | 21.91 | HKSCC Nominees Limited | 21.93 | HKSCC Nominees Limited | 21.92 | HKSCC Nominees Limited | 20.06 | HKSCC Nominees Limited | 20.07 | HKSCC Nominees Limited | 20.09 | HKSCC Nominees Limited | 20.12 | HKSCC Nominees Limited | 20.12 | HKSCC Nominees Limited | 20.15 |
| | | Hong Kong and Shanghai Banking Corporation Limited | 18.6 | HSBC | 18.6 | HSBC | 18.6 | HSBC | 18.63 | HSBC | 18.63 | Hong Kong and Shanghai Banking Corporation Limited | 18.7 | Hong Kong and Shanghai Banking Corporation Limited | 18.7 | HSBC | 18.7 | Hong Kong and Shanghai Banking Corporation Limited | 18.7 | Hong Kong and Shanghai Banking Corporation Limited | 18.7 | Hong Kong and Shanghai Banking Corporation Limited | 18.7 |
| Non-state-owned | | HKSCC Nominees Limited | 17.88 | HKSCC Nominees Limited | 17.78 | HKSCC Nominees Limited | 17.81 | HKSCC Nominees Limited | 18 | HKSCC Nominees Limited | 17.86 | HKSCC Nominees Limited | 17.87 | HKSCC Nominees Limited | 17.97 | HKSCC Nominees Limited | 17.97 | HKSCC Nominees Limited (1) | 18 | HKSCC Nominees Limited | 18 | HKSCC Nominees Limited | 18.03 |
| | China Merchants Bank | China Merchants Steam Navigation Company, Ltd | 12.11 | China Merchants Steam Navigation Company, Ltd | 12.37 | China Merchants Steam Navigation Company, Ltd | 12.37 | China Merchants Steam Navigation Company, Ltd | 13.04 | China Merchants Steam Navigation Company, Ltd | 12.4 | China Merchants Steam Navigation Company, Ltd | 12.4 | China Merchants Steam Navigation Company, Ltd | 12.54 | China Merchants Steam Navigation Company, Ltd | 12.54 | China Merchants Steam Navigation Company, Ltd | 13.04 | China Merchants Steam Navigation Company, Ltd | 13.04 | China Merchants Steam Navigation Company, Ltd | 13.04 |
| | | China Ocean Shipping (Group) Corporation | 6.44 | China Ocean Shipping (Group) Corporation | 6.44 | China Ocean Shipping (Group) Corporation | 5.94 | Anbang Property & Casualty Insurance Co., Ltd. -Traditional Products | 10.72 | China Ocean Shipping (Group) Corporation | 6.22 | China Ocean Shipping (Group) Corporation | 6.22 | China Ocean Shipping (Group) Corporation | 6.24 | Anbang Property & Casualty Insurance Co., Ltd. -Traditional Products | 10.72 | Anbang Property & Casualty Insurance Co., Ltd. -Traditional Products | 10.72 | Anbang Property & Casualty Insurance Co., Ltd. -Traditional Products | 10.72 | Anbang Property & Casualty Insurance Co., Ltd. -Traditional Products | 6.24 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------------------|---|------|--|------|---|-------|---|-------|---|-------|---|-------|---|-------|--|-------|--|-------|--|-------|--|-------|--|-------|
| | | NEWBRIDGE ASIA AIVIII, L. P. | 16.7 | NEWBRIDGE ASIA AIVIII, L. P. | 16.7 | NEWBRIDGE ASIA AIVIII, L. P. | 16.7 | Ping An Insurance (Group) Company of China, Ltd. -Group Level-Own Funds | 14.9 | Ping An Insurance (Group) Company of China, Ltd. - Group Level-Own Funds | 42.1 | Ping An Insurance (Group) Company of China, Ltd. - Group Level-Own Funds | 42.1 | Ping An Insurance (Group) Company of China, Ltd. - Group Level-Own Funds | 50.2 | Ping An Insurance (Group) Company of China, Ltd. - Group Level-Own Funds | 50.2 | Ping An Insurance (Group) Company of China, Ltd. - Group Level-Own Funds | 49.5 | Ping An Insurance (Group) Company of China, Ltd. - Group Level-Own Funds | 49.5 | Ping An Insurance (Group) Company of China, Ltd. - Group Level-Own Funds | 49.5 | Ping An Insurance (Group) Company of China, Ltd. - Group Level-Own Funds | 49.5 |
| | Ping An Bank | China Electronics Shenzhen Company | 2.99 | Ping An Life Insurance Company of China, Ltd.-Traditional-General Insurance Products | 4.86 | Ping An Life Insurance Company of China, Ltd.-Traditional-General Insurance Products | 4.54 | Ping An Life Insurance Company of China, Ltd.-Own Funds | 10.89 | Ping An Life Insurance Company of China, Ltd.-Own Funds | 7.41 | Ping An Life Insurance Company of China, Ltd.-Own Funds | 7.41 | Ping An Life Insurance Company of China, Ltd.-Own Funds | 6.38 | Ping An Life Insurance Company of China, Ltd.-Own Funds | 6.38 | Ping An Life Insurance Company of China, Ltd.-Own Funds | 6.11 | Ping An Life Insurance Company of China, Ltd.-Own Funds | 6.11 | Ping An Life Insurance Company of China, Ltd.-Own Funds | 6.11 | Ping An Life Insurance Company of China, Ltd.-Own Funds | 6.11 |
| | | Financing New Blue Chip Securities Investment Fund | 1.93 | China Electronics Shenzhen Company | 2.81 | China Electronics Shenzhen Company | 2.81 | Ping An Life Insurance Company of China, Ltd.-Traditional-General Insurance Products | 4.04 | Ping An Life Insurance Company of China, Ltd.-Traditional-General Insurance Products | 2.75 | Ping An Life Insurance Company of China, Ltd.-Traditional-General Insurance Products | 2.75 | Ping An Life Insurance Company of China, Ltd.-Traditional-General Insurance Products | 2.37 | Ge weidong | 2.4 | China Securities Finance Corporation Limited | 2.99 | China Securities Finance Corporation Limited | 2.79 | China Securities Finance Corporation Limited | 2.85 | HKSCC | 2.51 |
| | | New Hope Investment Co., Ltd | 5.9 | New Hope Investment Co., Ltd | 5.9 | HKSCC Nominees Limited | 15.29 | HKSCC Nominees Limited | 15.27 | HKSCC Nominees Limited | 15.27 | HKSCC Nominees Limited | 20.22 | HKSCC Nominees Limited | 20.24 | HKSCC Nominees Limited | 20.19 | HKSCC Nominees Limited | 18.91 | HKSCC Nominees Limited | 18.91 | HKSCC Nominees Limited | 18.91 | HKSCC Nominees Limited | 18.92 |
| | China Minsheng bank | China Life Insurance Company Limited-Traditional-General Insurance Products - 005L-CT001 Shanghai | 5.1 | China Life Insurance Company Limited-Traditional-General Insurance Products -005L-CT001 Shanghai | 5.1 | New Hope Investment Co., Ltd | 4.99 | New Hope Investment Co., Ltd | 4.99 | New Hope Investment Co., Ltd | 4.99 | New Hope Investment Co., Ltd | 4.7 | New Hope Investment Co., Ltd | 4.7 | Anbang Life Insurance Co., Ltd. - Robust Portfolio | 4.97 | Anbang Life Insurance Co., Ltd. - Robust Portfolio | 6.49 | Anbang Life Insurance Co., Ltd. - Robust Portfolio | 6.49 | Anbang Life Insurance Co., Ltd. - Robust Portfolio | 6.49 | Anbang Life Insurance Co., Ltd. - Conservative Portfolio | 10.3 |
| | | Ping An Life Insurance Company of China, Ltd.-Traditional-General Insurance Products | 4.93 | Ping An Life Insurance Company of China, Ltd.-Traditional-General Insurance Products | 4.92 | China Life Insurance Company Limited-Traditional-General Insurance Products - 005L-CT001 Shanghai | 4.31 | China Life Insurance Company Limited-Traditional-General Insurance Products - 005L-CT001 Shanghai | 4.31 | China Life Insurance Company Limited-Traditional-General Insurance Products - 005L-CT001 Shanghai | 4.31 | China Life Insurance Company Limited-Traditional-General Insurance Products - 005L-CT001 Shanghai | 4.06 | China Life Insurance Company Limited-Traditional-General Insurance Products - 005L-CT001 Shanghai | 4.06 | Anbang Property & Casualty Insurance Co., Ltd. - Traditional Products | 4.88 | Anbang Property & Casualty Insurance Co., Ltd. - Traditional Products | 4.56 | China Oceanwide Holding Group Co., Ltd. | 4.61 | China Securities Finance Corporation Limited | 4.75 | Anbang Life Insurance Co., Ltd. - Robust Portfolio | 6.49 |

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|--|----------------------------------|--|--------|--|--------|--|--------|---|--------|--|--------|---|--------|---|--------|---|--------|---|-------|---|-------|---|-------|
| | | Shanghai International Group Co., Ltd. | 23.573 | Shanghai International Group Co., Ltd. | 23.573 | Shanghai International Group Co., Ltd. | 21.159 | China Mobile Communications Group Guangdong Co., Ltd. | 20 | China Mobile Communications Group Guangdong Co., Ltd. | 20 | China Mobile Communications Group Guangdong Co., Ltd. | 20 | China Mobile Communications Group Guangdong Co., Ltd. | 20 | China Mobile Communications Group Guangdong Co., Ltd. | 20 | Shanghai International Group Co., Ltd. | 19.53 | Shanghai International Group Co., Ltd. | 21.57 | Shanghai International Group Co., Ltd. | 21.57 |
| | Shanghai Pudong Development Bank | Shanghai International Trust Co., Ltd. | 7.286 | Shanghai International Trust Co., Ltd. | 7.286 | Shanghai International Trust Co., Ltd. | 6.54 | Shanghai International Group Co., Ltd. | 16.927 | Shanghai International Group Co., Ltd. | 16.927 | Shanghai International Group Co., Ltd. | 16.927 | Shanghai International Group Co., Ltd. | 16.927 | Shanghai International Group Co., Ltd. | 16.927 | China Mobile Communications Group Guangdong Co., Ltd. | 18.98 | China Mobile Communications Group Guangdong Co., Ltd. | 18.18 | China Mobile Communications Group Guangdong Co., Ltd. | 18.18 |
| | | CITIBANK OVERSEAS INVESTMENT CORPORATION | 3.779 | CITIBANK OVERSEAS INVESTMENT CORPORATION | 3.779 | CITIBANK OVERSEAS INVESTMENT CORPORATION | 3.392 | Shanghai International Trust Co., Ltd. | 5.232 | Shanghai International Trust Co., Ltd. | 5.232 | Shanghai International Trust Co., Ltd. | 5.232 | Shanghai International Trust Co., Ltd. | 5.232 | Funde Sino Life Insurance Co., Ltd. - Tradition | 10.42 | Funde Sino Life Insurance Co., Ltd. - Tradition | 9.89 | Funde Sino Life Insurance Co., Ltd. - Tradition | 9.47 | Funde Sino Life Insurance Co., Ltd. - Tradition | 9.47 |
| | | CITIC Group | 62.33 | CITIC Group | 62.33 | CITIC Group | 61.78 | CITIC Group | 61.78 | China CITIC Group Co., Ltd. (formerly China CITIC Group Corporation) | 61.85 | China CITIC Group Co., Ltd. | 61.85 | China CITIC Corporation Limited | 66.95 | China CITIC co., Ltd | 67.13 | China CITIC co., Ltd | 67.13 | China CITIC co., Ltd | 65.37 | China CITIC co., Ltd | 65.37 |
| | CITIC Bank | CITIC International Financial | 15 | HKSCC Nominees Limited | 15.66 | HKSCC Nominees Limited | 15.68 | HKSCC Nominees Limited | 15.65 | HKSCC Nominees Limited | 15.74 | HKSCC Nominees Limited | 15.75 | HKSCC Nominees Limited | 15.76 | HKSCC Nominees Limited | 25.86 | HKSCC Nominees Limited | 25.89 | HKSCC Nominees Limited | 24.75 | HKSCC Nominees Limited | 24.78 |
| | | HKSCC Nominees Limited | 12.41 | Gloryshare Investments Limited | 9.9 | Banco Bilbao Vizcaya Argentaria S. A. | 10.07 | Banco Bilbao Vizcaya Argentaria S. A. | 10.015 | Banco Bilbao Vizcaya Argentaria S. A. | 10.015 | Banco Bilbao Vizcaya Argentaria S. A. | 10.015 | The National Council for Social Security Fund Held Three Families | 9.9 | China Securities Finance Corporation Limited | 0.55 | China National Tobacco Corporation | 1.86 | China National Tobacco Corporation | 4.39 | China National Tobacco Corporation | 4.39 |
| | | | | | | | | Central Huijin | 48.37 | Central Huijin | 48.37 | Central Huijin | 48.37 | Central Huijin | 41.66 | Central Huijin | 41.24 | China Everbright Group | 23.96 | China Everbright Group | 25.15 | China Everbright Group | 25.43 |
| | China Everbright Bank | | | | | | | China Everbright (Group) Corporation | 5.18 | China Everbright (Group) Corporation | 5.18 | China Everbright (Group) Corporation | 5.18 | HKSCC Nominees Limited | 13.87 | HKSCC Nominees Limited | 14.76 | Central Huijin | 21.96 | Central Huijin | 21.96 | HKSCC Nominees Limited | 24.14 |
| | | | | | | | | China Everbright Holdings Limited | 4.35 | China Everbright Holdings Limited | 4.35 | China Everbright Holdings Limited | 4.35 | China Everbright (Group) Corporation | 4.44 | China Everbright Group | 4.41 | HKSCC Nominees Limited | 14.76 | HKSCC Nominees Limited | 14.76 | Central Huijin | 19.53 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-------------|----------------------------------|-------|---------------------------------|-------|----------------------------------|-------|--|-------|---|-------|---|-------|---|-------|---|-------|--|-------|--|-------|--|-------|--|-------|
| | | Shougang Corporation | 10.19 | Shougang Corporation | 13.98 | Shougang Corporation | 13.98 | Shougang Corporation | 13.98 | Shougang Corporation | 20.28 | Shougang Corporation | 20.28 | Shougang Corporation | 20.28 | Shougang Corporation | 20.28 | Shougang Corporation | 20.28 | Shougang Corporation | 20.28 | Shougang Group Co., Ltd. | 20.28 | Shougang Group Co., Ltd. | 20.28 |
| | Huaxia Bank | State Grid Corporation of China | 8.15 | State Grid Corporation of China | 11.94 | State Grid Corporation of China | 11.94 | State Grid Corporation of China | 11.94 | Yingda International Holding Group Co., Ltd. | 18.24 | Guowang Yingda International Holding Group Co., Ltd. | 18.24 | Guowang Yingda International Holding Group Co., Ltd. | 18.24 | Guowang Yingda International Holding Group Co., Ltd. | 18.24 | China People's Property Insurance Company Limited | 19.99 | China People's Property Insurance Company Limited | 19.99 | China People's Property Insurance Company Limited | 19.99 | China People's Property Insurance Company Limited | 19.99 |
| | | Hongta Tobacco (Group) Co., Ltd. | 7.13 | DEUTSCHE BANKAKTIENGESELLSCHAFT | 11.27 | DEUTSCHE BANK AKTIENGESELLSCHAFT | 11.27 | DEUTSCHE BANK AKTIENGESELLSCHAFT Deutsche Bank Luxembourg S.A. | 11.27 | DEUTSCHE BANK LUXEMBOURG S. A (Deutsche Bank Luxembourg S.A.) | 9.28 | DEUTSCHE BANK LUXEMBOURG S. A (Deutsche Bank Luxembourg S.A.) | 9.28 | DEUTSCHE BANK LUXEMBOURG S. A (Deutsche Bank Luxembourg S.A.) | 9.28 | DEUTSCHE BANK LUXEMBOURG S. A (Deutsche Bank Luxembourg S.A.) | 9.28 | Guowang Yingda International Holding Group Co., Ltd. | 18.24 | Guowang Yingda International Holding Group Co., Ltd. | 18.24 | Guowang Yingda International Holding Group Co., Ltd. | 18.24 | Guowang Yingda International Holding Group Co., Ltd. | 18.24 |

Data Sources: Genius Finance: <http://www.genius.com.cn/geniusData.html> (2007-2018).

(II) Equity attributes

In terms of equity attributes, there are generally state-owned shares, general legal person shares, foreign shares. In China, state-owned shares occupy a large proportion, which is also the focus of equity attribute analysis.

The following table shows: (1) the proportion of state-owned shares is relatively high: On the one hand, the commercial banks in the sample generally have 41.23% state-owned shares on average; on the other hand, it is found through specific analysis that the proportion of state-owned shares in the Bank of China, Agricultural Bank of China, Industrial and Commercial Bank of China, China Construction Bank, Huaxia Bank and China CITIC Bank exceeds 50% each; the proportion of state-owned shares in the Bank of Communications, Shanghai Pudong Development Bank, China Merchants Bank is between 20% and 50%; the proportion of state-owned shares in Everbright Bank is only 10% to 20%. Even, there are no state-owned shareholders in China Minsheng Bank and Ping An Bank. (2) The proportion of foreign shares varies greatly. Shanghai Pudong Development Bank and Ping An Bank have no foreign shareholders. The Communications Bank of China has the largest proportion of foreign shares, up to 47.15%. There are five banks whose percentage of foreign shares exceeds 20% and three banks whose percentage of foreign shares is not larger than 20% but close to 20%. With the opening-up of capital markets, the percentage of foreign

shares will continue to increase. (3) The largest shareholder holds the most state-owned shares. Among 12 sample banks, the largest shareholders in the 10 banks hold state-owned shares. It indicates that, affected by the national situation of China and the remaining issues after equity reform, state-owned shares remain to occupy an important position in commercial banks and to have a large power.

Table 4-3 Equity attributes and proportion

| Bank name | Percentage of state-owned shares (%) | Percentage of foreign shares (%) | Equity attribute |
|----------------------------------|--------------------------------------|----------------------------------|--------------------|
| Bank of China | 67.46 | 28.41 | State-owned shares |
| Agricultural Bank of China | 85.24 | 9.46 | State-owned shares |
| Industrial and Commercial Bank | 71.16 | 24.35 | State-owned shares |
| China Construction Bank | 60.19 | 37.16 | State-owned shares |
| Bank of Communications | 31.9 | 47.15 | State-owned shares |
| China Minsheng Bank | 0 | 19 | Foreign shares |
| Shanghai Pudong Development Bank | 44.9 | 0 | State-owned shares |
| Everbright Bank | 19.53 | 13.09 | State-owned shares |

| | | | |
|----------------------|-------|-------|---------------------------------|
| China Merchants Bank | 37.1 | 18.2 | State-owned legal person shares |
| Huaxia Bank | 67.26 | 19.99 | State-owned legal person shares |
| Ping An Bank | 0 | 0 | Legal person shares |
| China CITIC Bank | 72.7 | 30.41 | State-owned legal person shares |

Data Sources: Annual reports of commercial banks

Based on the high percentage of state-owned shares concluded in the above analysis, the current situation of state-owned shares in banks' equity structure is analyzed in detail based on the data of the Bank of China, Agricultural Bank of China, Industrial and Commercial Bank of China, Construction Bank of China and Bank of Communications. In view of the long history, large capital scale, government support and other advantages of large-scale commercial banks, it is of great historical and theoretical significance to analyze the conditions of their state-owned shares. As shown in Table 4-3, Central Huijin Investment Ltd. and the Ministry of Finance are main holders of state-owned shares in equity structure of China's commercial banks and are in a controlling position (except the Bank of Communications). The banks are sorted as follows in terms of the proportion of their state-owned shares: Agricultural Bank of China, Industrial and Commercial Bank of China, Bank of China, and China Construction Bank and Bank of Communications. The total number of state-owned shares of

large-scale commercial banks is 865.476 billion, including: 584.968 billion shares held by Central Huijin, 67.59% of the total state-owned shares of these banks; 270.711 billion shares held by the Ministry of Finance (31.27%) and 9.797 billion shares held by the National Council for Social Security Fund (1.14%). The state-owned shares are the most, which is another major characteristic of the equity structure of China's commercial banks.

In fact, when the stock rights are highly concentrated, the absolute controlling shareholders enjoy absolute property rights, which will have an incentive effect on their participation in the management and operation of the enterprise. In real life, the controlling shareholders may motivate the work motivation and efficiency of the management and managers through annual salary, stock, bonus and other methods, which can reduce the operating cost and improve the operating performance to a certain extent.⁶⁵ However, the absolute control right possessed by the absolute controlling shareholder has strongly suppressed the voice of other controlling shareholders. In this case, although the management is encouraged, only the existence of the controlling shareholder cannot perfect and effectively supervise the management and the management, which may cause the entire enterprise totally controlled by the controlling shareholder, and is not conducive to the overall interests and long-term stable development of the company. Under the condition of highly dispersed ownership, absolute

⁶⁵ Xing Huabin. Research on Property Rights and Governance Structure Innovation of State-owned Commercial Banks [D]. Nankai University, 2014.

majority shareholders do not exist, and the shareholding ratio of other shareholders is also subject to allocation restrictions. As a result, each shareholder can play a limited role, and the role played by incentive methods such as annual salary and stock options provided by the management is not also very insignificant. Although the conflicts of interest between the ownership owner and the management of the enterprise may be well disguised on the surface, the company's operating performance may decline with the lack of motivation of the management and the limited supervision ability of small shareholders. Relatively concentrated and relatively dispersed equity arrangements can effectively contain shareholders. When faced with key issues, several shareholders will generally make decisions through common negotiation. Considering the interests of many parties, the feasibility of decisions jointly negotiated by shareholders is higher. At the same time, in order to maximize their own benefits, shareholders will also supervise and report to each other, making corporate governance develop towards an efficient and transparent direction, which is conducive to promoting the sound development of operating performance.

(III) Executive political connection

In China, the president should not only supervise the bank's managers and review the budget reports, but also deal with the company's external affairs and coordinate external relations. Therefore, the president is more likely to use his political connection to obtain more external resources such as financing and land for the company at a relatively low cost, and then promote

the improvement of the company's operating efficiency. On the other hand, in order to strive for promotion opportunities, the president will use his political resources to maximize the performance of his bank. The president is mainly responsible for the company's administrative management and the implementation of the company's decision-making, and is the main person responsible for the company's daily business activities. Although the president needs to serve the interests of shareholders, maintain and increase the value of operating assets, use his/her political connection to strive for more favorable financing conditions for the company, and reduce the cost of capital, the president may also use the company's resources to establish political connection with officials for private interests, resulting in the increase of the company's operating costs and the reduction of business performance. When the self-interest brought by moral hazard is equal to or even greater than the net income brought by serving the interests of shareholders, the impact of political connection on corporate performance will become inapparent or even negative.

Table 4-4 Political Connection of Sample Bank Presidents

| Bank | Name | Resume | Working experience in state-owned banking institutions | Working experience in government |
|---|-------------|---|--|----------------------------------|
| Bank of China | Chen Siqing | He joined Bank of China in 1990. He was Vice President of Bank of China from June 2008 to February 2014. From June 2000 to May 2008, he successively served as Assistant President and Vice President of Fujian Branch of Bank of China, General Manager of Risk Management Department of the head office of Bank of China and President of Guangdong Branch of Bank of China. Before that, he had worked in Hunan Branch for many years and assigned to Hong Kong Branch of China & South Sea Bank as Assistant General Manager. Since December 2011, he has concurrently served as the Non-Executive Director of BOC Hong Kong (Holdings) Co., Ltd., Chairman of BOC Aviation, and Vice Chairman of BOC Hong Kong (Holdings) Co., Ltd. since March 2014. | Yes | No |
| Industrial and Commercial Bank of China | Yi Huiman | He joined Industrial and Commercial Bank of China in 1985 and has been a senior management member of Industrial and Commercial Bank of China Limited since October 2005. He used to be Vice President of Zhejiang Branch of Industrial and Commercial Bank of China, President of Jiangsu Branch, President of Beijing Branch and Vice President of Industrial and Commercial Bank of China. | Yes | No |
| China Construction Bank | Wang Zuji | Vice Chairman of China Insurance Regulatory Commission from September 2012 to May 2015, Vice Governor of Jilin Province from January 2008 to September 2012, Assistant Governor of Jilin Province, Director of Provincial Development and Reform Commission, and Director of Office of Leading Group for Revitalizing Old Industrial Base of Jilin Province from April 2006 to January 2008, Assistant Governor of Jilin Province and Director of State-Owned Assets Supervision And Management Commission of Jilin Province from May 2005 to April 2006, Assistant Governor of Jilin Province from February 2005 to May 2005, Director of the Comprehensive Planning Bureau of the National Development Bank from January 2004 to February 2005, Director of the Business Development Bureau of the National Development Bank from March 2003 to January 2004, President of Changchun Branch of the National Development Bank from January 2000 to March 2003, Deputy Director of the Second Credit Bureau (Northeast Credit Bureau) of the National Development Bank from January 1997 to January 2000. | Yes | Yes |
| Agricultural Bank of China | Zhao Huan | He used to be Deputy Director and Director of Business Management Division of Credit Department of China Construction Bank, Director of General Management Division of Corporate Business Department, Deputy General Manager of Corporate Business Department, Vice President of Xiamen Branch, General Manager of Corporate Business Department, President of Shanghai Branch, and Vice President of China Construction Bank from March 2011. From January 2014, he successively served as the Executive Director of China Everbright (Group) Corporation, China Everbright Group Co., Ltd., and Executive Director and President of China Everbright Bank Co., Ltd. | Yes | No |
| Bank of Communications | Peng Chun | From April 2010 to September 2013, he served as Deputy General Manager of China Investment Corporation, Executive Director and General Manager of Central Huijin Investment Ltd., Executive Director and Vice President of Bank of Communications from August 2005 to April 2010, Vice President of Bank of Communications from September 2004 to August 2005, Vice President and President of Urumqi Branch, President of Nanning Branch and President of Guangzhou Branch from 1994 to 2001. | Yes | No |
| Ping An Bank | Shao Ping | In 1995, he participated in the preparation for the construction of China Minsheng Bank. From 1996 to 2012, he successively served as the Deputy Director of Credit Department of the head office of Minsheng Bank, the Deputy General Manager and General Manager of Credit Business Department of the head office, the Secretary of the Party Committee and President of Shanghai Branch, the member of the Party Committee and Assistant to the President of the head office, the member of the Party Committee and Vice President of the head office, and the Chairman of the Risk Management Committee of the head office. Since October 2012, he has been a director of Ping An Bank; since November 2012, he has been the President of Ping An Bank. Before joining Minsheng Bank, he was the Secretary of the Party Committee and General Manager of Weicheng Urban Credit Union, Weifang City, Shandong Province, and Deputy Secretary of the Party Committee and Deputy General Manager of Weifang Credit Union. | Yes | Yes |
| Shanghai Pudong Development Bank | Liu Xinyi | He used to be Vice President of Airport Branch of Shanghai Pudong Development Bank, member of the Party Committee and Deputy General Manager of Shanghai regional headquarters of Shanghai Pudong Development Bank; held a temporary position in Shanghai Financial Service Office, head of Institutional Department and Director Assistant of Shanghai Financial Service Office; Vice President of Shanghai Pudong Development Bank and Secretary of the Party Committee and General Manager of Shanghai regional headquarters, Vice President of Shanghai Pudong Development Bank and Secretary of the Party Committee and President of Shanghai Branch, Vice President and Chief Financial Officer of Shanghai Pudong Development Bank; President and Deputy Secretary of the Party Committee of Shanghai Guosheng Group Co., Ltd. At present, he is the Vice Chairman, Deputy Secretary of the Party Committee and President of Shanghai Pudong | Yes | Yes |

| | | | | |
|-----------------------|----------------|--|-----|-----|
| | | Development Bank Co., Ltd. and the Chairman of SPD Silicon Valley Bank. | | |
| CITIC Bank | Fang Heying | He served as the director of CITIC Bank's financial market business in May 2013, and concurrently served as the secretary and president of the CITIC Bank Hangzhou Branch from May 2014; he served as the secretary and president of the CITIC Bank Suzhou branch from March 2007 to May 2013; 2003 From September to March 2007, he served as a member of the party committee, assistant president and deputy president of the China CITIC Bank Hangzhou Branch; from December 1996 to September 2003, he worked at the China CITIC Bank Hangzhou Branch and served as the section chief and deputy general manager of the Credit Department. President of Fuyang Sub-branch, Party Secretary, Deputy General Manager of International Settlement Department, Deputy General Manager of Retail Business Department, General Manager of Sales Department; From July 1996 to December 1996, he served as Deputy Director of Hangzhou Chengdong Office of Pudong Development Bank. | Yes | No |
| Huaxia Bank | Fan Dazhi | Former teacher of Dongbei University of Finance and Economics; General Manager of Investment Bank Headquarters of Beijing International Trust Co., Ltd.; member of the Party group and Deputy Director of Beijing Overseas Financial Investment Management Center; member of the Party group, Director and Deputy General Manager of Beijing State-owned Assets Management Co., Ltd.; Deputy Secretary of the Party Committee, Director and General Manager of Beijing Securities Co., Ltd.; Chief supervisor of UBS Securities Co., Ltd; Director, Deputy Secretary of the Party Committee, Vice President and Executive Vice President of Huaxia Bank. | Yes | Yes |
| China Minsheng Bank | Zheng Wanchun | He used to be the Assistant President and General Manager of the Business Department of Hainan Branch of Industrial and Commercial Bank of China, the Deputy General Manager of the Industrial and Commercial Credit Department of the head office, the Deputy General Manager of the Creditor's Rights Department, the General Manager of the Creditor's Rights Department, the General Manager of the Business Management Department and the Assistant President of China Huarong Asset Management Co., Ltd., the Vice President of China Huarong Asset Management Co., Ltd. and Chairman of Huarong Securities and the Chairman of Sino-German joint venture Rongde Asset Management Co., Ltd. in December 2004. In January 2009, he was Vice President of China Huarong Asset Management Co., Ltd., Chairman of Huarong Securities and Chairman of Huarong Futures, and in March 2011, he was President of China Great Wall Asset Management Co., Ltd. | Yes | No |
| China Merchants Bank | Tian Huiyu | From July 1998 to July 2003, he was Vice President of Trust and Investment Company, China Cinda Asset Management Co., Ltd., and Vice President of Bank of Shanghai from July 2003 to December 2006. From December 2006 to March 2011, he successively served as Vice President of Shanghai Branch, Main Principal and President of Shenzhen Branch of China Construction Bank. From March 2011 to May 2013, he was Retail Business Director and Principal and President of Beijing Branch of China Construction Bank. | Yes | No |
| China Everbright Bank | Zhang Jinliang | At present, he is a member of the Party Committee and Executive Director of China Everbright Group Co., Ltd. He was Vice President of Bank of China from July 2014 to January 2016, and President of Beijing Branch of Bank of China from November 2009 to December 2014. Previously, he worked in the Finance and Accounting Department of the head office of the Bank of China for many years, and served as the General Manager of the Financial Management Department of the head office of the Bank of China from February 2007 to November 2009. From October 2003 to February 2007, he served as the Deputy General Manager of the Finance and Accounting Department of the head office of the Bank of China, and also as the director of IT Blueprint Implementation Office from March 2005 to February 2007. | Yes | No |

Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.

From the above data, it can be seen that among the sample banks, the presidents of state-owned commercial banks and non-state-owned commercial banks have the experience of working in state-owned banking institutions, nearly 30% of the bank presidents have the experience of working in government institutions, which reflects that the actual controllers of China's commercial banks have a high degree of political relevance, and the operation and management of commercial banks will be subject to certain political factors.

4.2.2 Scale Strength Index Analysis

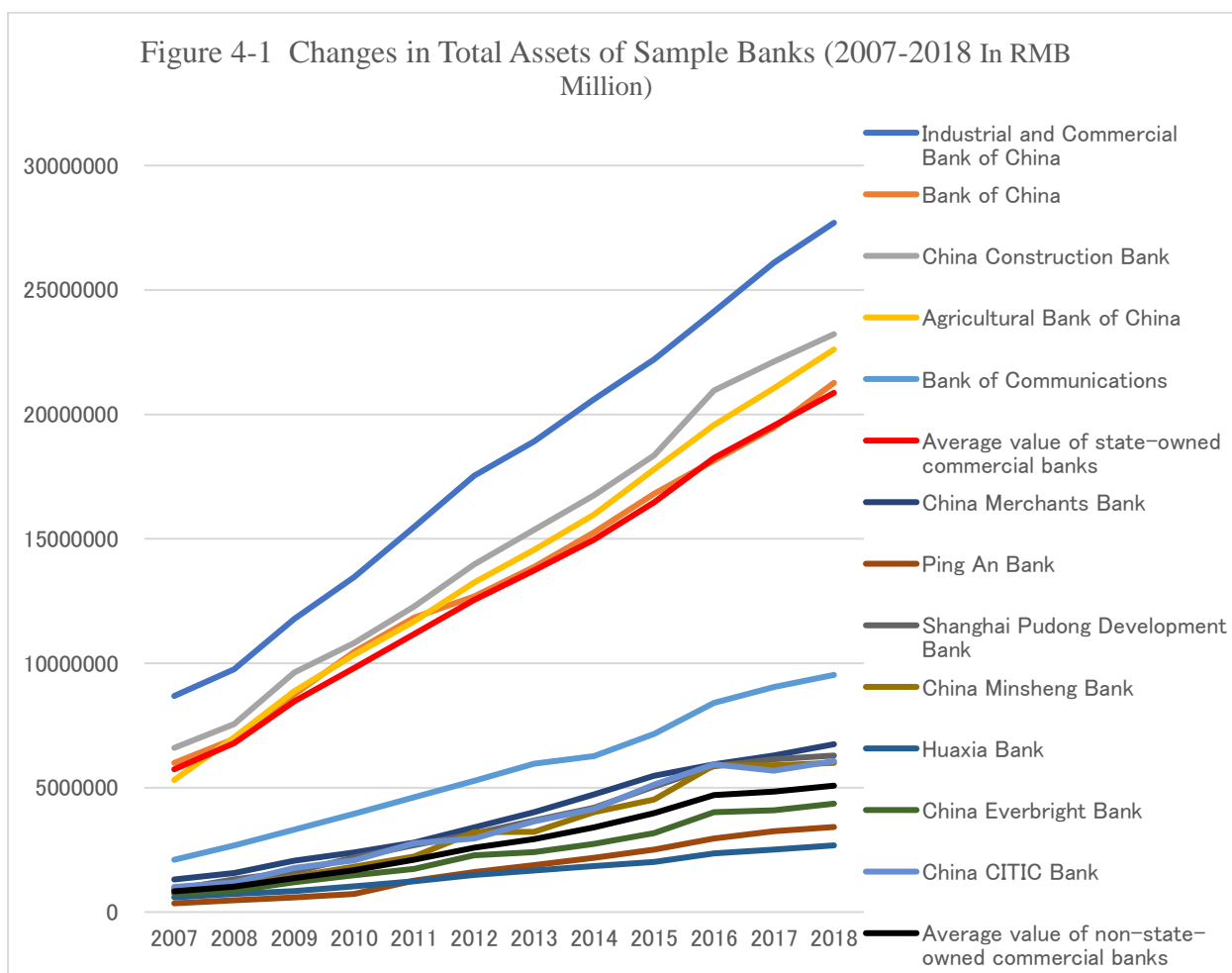
In terms of total assets, state-owned commercial banks have an overwhelming advantage over non-state-owned commercial banks. The average value of total assets is about 4 times that of non-state-owned commercial banks. The total assets of Industrial and Commercial Bank of China reached RMB 27 trillion in 2018, ranking first in the total assets of the global banking industry. Judging from the total asset increment of the sample banks from 2007 to 2018, the state-owned commercial banks still have advantages. Among the 12 sample banks, the top five in total asset increment are all state-owned commercial banks, and the strong capital growth has laid a solid foundation for their operation and management. From 2007 to 2009, the average value of total assets of state-owned commercial banks was nearly 7 times that of non-state-owned commercial banks, but from 2014 to 2018, this multiple ratio was reduced to 4 times. The gap

between total assets of non-state-owned commercial banks and total assets of state-owned commercial banks is gradually decreasing, but there is still a big gap.

Table 4-5 Changes in Total Assets of Sample Banks (2007-2018, In RMB Million)

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|-----------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Industrial and Commercial Bank of China | 8,684,288 | 9,757,654 | 11,785,053 | 13,458,622 | 15,476,868 | 17,542,217 | 18,917,752 | 20,609,953 | 22,209,780 | 24,137,265 | 26,087,043 | 27,699,540 |
| Bank of China | 5,995,553 | 6,955,694 | 8,751,943 | 10,459,865 | 11,830,066 | 12,680,615 | 13,874,299 | 15,251,382 | 16,815,597 | 18,148,889 | 19,467,424 | 21,267,275 |
| China Construction Bank | 6,598,177 | 7,555,452 | 9,623,355 | 10,810,317 | 12,281,834 | 13,972,828 | 15,363,210 | 16,744,130 | 18,349,489 | 20,963,705 | 22,124,383 | 23,222,693 |
| Agricultural Bank of China | 5,305,506 | 7,014,351 | 8,882,588 | 10,337,406 | 11,677,577 | 13,244,342 | 14,562,102 | 15,974,152 | 17,791,393 | 19,570,061 | 21,053,382 | 22,609,471 |
| Bank of Communications | 2,103,626 | 2,678,255 | 3,309,137 | 3,951,593 | 4,611,177 | 5,273,379 | 5,960,937 | 6,268,299 | 7,155,362 | 8,403,166 | 9,038,254 | 9,531,171 |
| China Merchants Bank | 1,310,552 | 1,571,797 | 2,067,941 | 2,402,507 | 2,794,971 | 3,408,219 | 4,016,399 | 4,731,829 | 5,474,978 | 5,942,311 | 6,297,638 | 6,745,729 |
| Ping An Bank | 352,539 | 474,440 | 587,811 | 727,610 | 1,258,177 | 1,606,537 | 1,891,741 | 2,186,459 | 2,507,149 | 2,953,434 | 3,248,474 | 3,418,592 |
| Shanghai Pudong Development Bank | 914,980 | 1,309,425 | 1,622,718 | 2,191,411 | 2,684,694 | 3,145,707 | 3,680,125 | 4,195,924 | 5,044,352 | 5,857,263 | 6,137,240 | 6,289,606 |
| China Minsheng Bank | 919,796 | 1,054,350 | 1,426,392 | 1,823,737 | 2,229,064 | 3,212,001 | 3,226,210 | 4,015,136 | 4,520,688 | 5,895,877 | 5,902,086 | 5,994,822 |
| Huaxia Bank | 592,338 | 731,637 | 845,456 | 1,040,230 | 1,244,141 | 1,488,860 | 1,672,447 | 1,851,628 | 2,020,604 | 2,356,235 | 2,508,927 | 2,680,580 |
| China Everbright Bank | 739,186 | 851,838 | 1,197,696 | 1,483,950 | 1,733,346 | 2,279,295 | 2,415,086 | 2,737,010 | 3,167,710 | 4,020,042 | 4,088,243 | 4,357,332 |
| CITIC Bank | 1,011,236 | 1,187,837 | 1,775,031 | 2,081,314 | 2,765,881 | 2,959,939 | 3,641,193 | 4,138,815 | 5,122,292 | 5,931,050 | 5,677,691 | 6,066,714 |
| Average of state-owned banks | 5,737,430 | 6,792,281 | 8,470,415 | 9,803,561 | 11,175,504 | 12,542,676 | 13,735,660 | 14,969,583 | 16,464,324 | 18,244,617 | 19,554,097 | 20,866,030 |
| Average of non-state-owned banks | 834,375 | 1,025,903 | 1,360,435 | 1,678,680 | 2,101,468 | 2,585,794 | 2,934,743 | 3,408,114 | 3,979,682 | 4,708,030 | 4,837,186 | 5,079,054 |

Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.

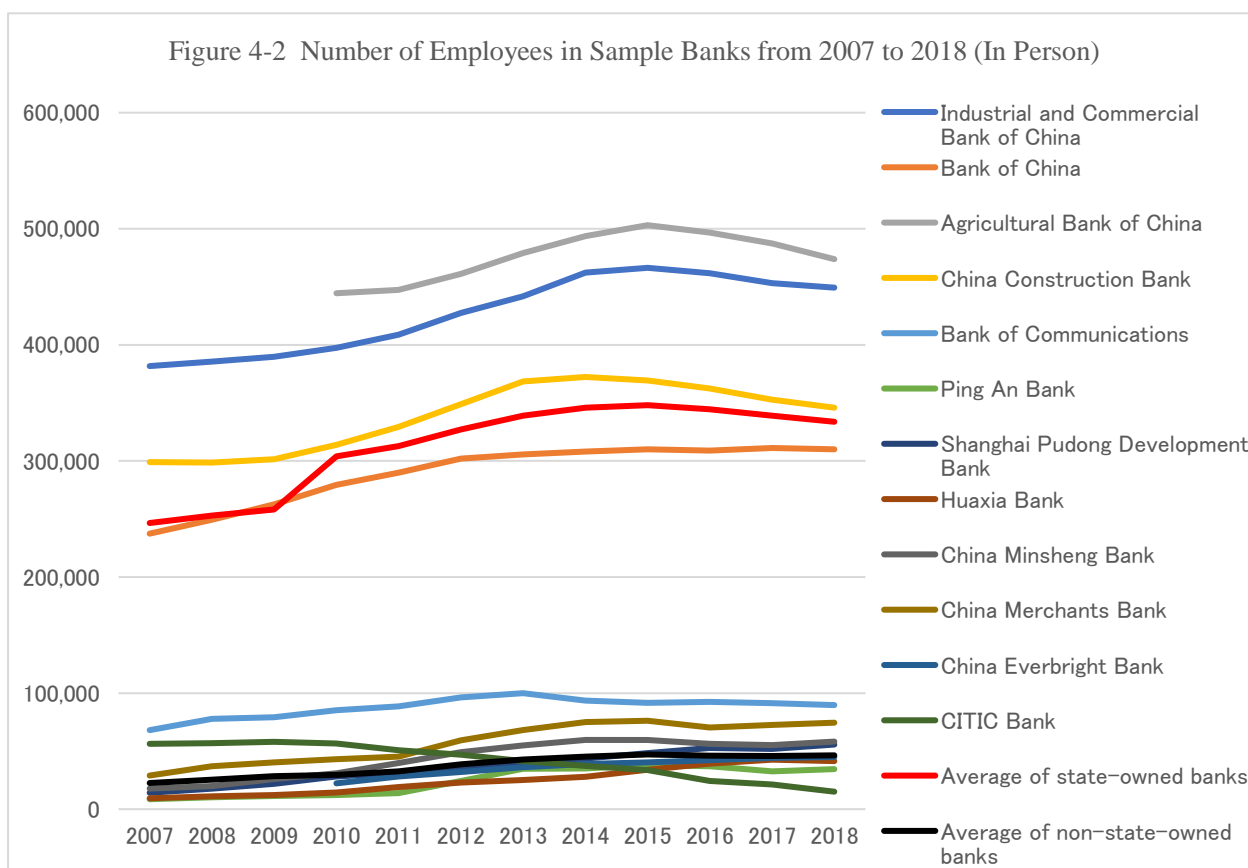
As for the number of employees, both state-owned commercial banks and non-state-owned commercial banks showed an upward trend from 2007 to 2013, but showed a downward trend from 2014 to 2017. However, the number of employees in state-owned commercial banks is still much higher than that in non-state-owned commercial banks. The state-owned commercial banks have many branches, complete internal management system, large investment in new business resources, and need a large number of talents to maintain operations. The main reasons for the negative growth in the number

of employees are as follows: 1. With the prosperity and development of China's Internet and the popularization of mobile Internet, the development of Internet finance is advancing by leaps and bounds. With the emergence of smart banks and unmanned banks, the demand for front-line tellers and front-line marketing personnel has been reduced. The demand for technical development personnel, maintenance personnel and product development personnel has increased rapidly, and the requirement for management personnel is also constantly improving. Some banks' employees with low academic qualifications and low technical level are unable to adapt to the development speed of the Internet financial model, resulting in faster mobility of personnel. 2. Since the reform of financial institutions began in 1997, the talent gap in China's commercial banks has gradually increased. By this year, the reform of financial institutions in China has gone through 22 years. Some newly-established employees have reached the retirement age. In addition, in recent years, the difficulty of campus recruiting of commercial banks has increased, and the enthusiasm of the banking industry is much less than before. As a result, the turnover of personnel is larger than the increase of personnel, resulting in negative growth in the number of employees in the banking industry.

Table 4-6 Details of Number of Employees in Sample Banks from 2007 to 2018 (In Person)

| Bank name | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Industrial and Commercial Bank of China | 381,713 | 385,609 | 389,827 | 397,339 | 408,859 | 427,356 | 441,902 | 462,282 | 466,346 | 461,749 | 453,048 | 449,296 |
| Bank of China | 237,379 | 249,278 | 262,566 | 279,301 | 289,951 | 302,016 | 305,675 | 308,128 | 310,042 | 308,900 | 311,133 | 310,119 |
| Agricultural Bank of China | | | | 444,447 | 447,401 | 461,100 | 478,980 | 493,583 | 503,082 | 496,698 | 487,307 | 473,691 |
| China Construction Bank | 298,868 | 298,581 | 301,537 | 313,867 | 329,438 | 348,955 | 368,410 | 372,321 | 369,183 | 362,482 | 352,621 | 345,971 |
| Bank of Communications | 68,083 | 77,734 | 79,122 | 85,290 | 88,480 | 96,259 | 99,919 | 93,658 | 91,468 | 92,556 | 91,240 | 89,542 |
| Ping An Bank | 8,573 | 10,381 | 11,308 | 12,203 | 13,778 | 24,251 | 34,724 | 35,069 | 37,937 | 36,885 | 32,502 | 34,626 |
| Shanghai Pudong Development Bank | 14,128 | 17,695 | 21,877 | 28,081 | 31,231 | 35,784 | 38,976 | 43,654 | 48,427 | 52,832 | 51,944 | 55,692 |
| Huaxia Bank | 9,390 | 11,109 | 12,301 | 14,304 | 19,169 | 22,991 | 25,200 | 27,835 | 34,023 | 39,098 | 42,644 | 41,283 |
| China Minsheng Bank | 17,766 | 19,853 | 26,039 | 30,931 | 39,885 | 49,227 | 54,927 | 59,659 | 59,510 | 56,168 | 55,265 | 58,338 |
| China Merchants Bank | 28,971 | 36,916 | 40,340 | 43,089 | 45,344 | 59,340 | 68,078 | 75,109 | 76,192 | 70,461 | 72,530 | 74,590 |
| China Everbright Bank | | | | 22,267 | 28,267 | 31,968 | 36,290 | 39,015 | 40,319 | 42,250 | 44,066 | 44,982 |
| CITIC Bank | 56,415 | 56,724 | 58,023 | 56,489 | 50,735 | 46,822 | 41,365 | 37,195 | 33,552 | 24,180 | 21,385 | 15,070 |
| Average of state-owned banks | 246,511 | 252,801 | 258,263 | 304,049 | 312,826 | 327,137 | 338,977 | 345,994 | 348,024 | 344,477 | 339,070 | 333,724 |
| Average of non-state-owned banks | 22,541 | 25,446 | 28,315 | 29,623 | 32,630 | 38,626 | 42,794 | 45,362 | 47,137 | 45,982 | 45,762 | 46,369 |

Data sources: CSMAR database: <http://cndata.csmar.com/>, annual reports of sample banks and China Financial Yearbook 2008-2018.



Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.

Compared with non-state-owned commercial banks, state-owned commercial banks have outstanding advantages in scale and strength, which is due to their good reputation, long operating history and extensive business scope in China. The stable capital source, relatively closed equity structure and mature trans-regional development degree of state-owned commercial banks are the basic guarantee for the scale strength of state-owned commercial banks. However, the gap of the scale and strength with non-state-owned commercial banks is gradually narrowing. Non-state-owned commercial banks have their own unique advantages in inclusive finance. Their

personalized services and customized products will bring new opportunities for their development.

4.2.3 Profitability Index Analysis

Industrial and Commercial Bank of China still has an absolute advantage in terms of operating income, ranking first in the sample time. Among non-state-owned commercial banks, China Merchants Bank has the highest operating income in the sample period and its growth is relatively stable. The growth of Shanghai Pudong Development Bank and CITIC Bank is also more stable compared with other samples. In 2007, the average operating income of state-owned commercial banks was 7.5 times that of non-state-owned commercial banks. By 2018, this figure had shrunk to 3.6 times, but it still existed. Among the state-owned commercial banks, only Bank of Communications' operating income is lower than the average, while among the non-state-owned commercial banks, Ping An Bank, Huaxia Bank and China Everbright Bank are also lower than the average. From the perspective of the composition of operating income, interest income is still an important component of operating income, but it shows a decreasing trend year by year. For example, the proportion of interest income of state-owned commercial banks dropt from 87% in 2007 to 73% in 2018, while the proportion of interest income of non-state-owned commercial banks would be 61%. This shows that interest income has no longer become a major source of income for commercial banks, especially not focused by non-state-owned commercial banks. Instead, the proportion of fee and commission income

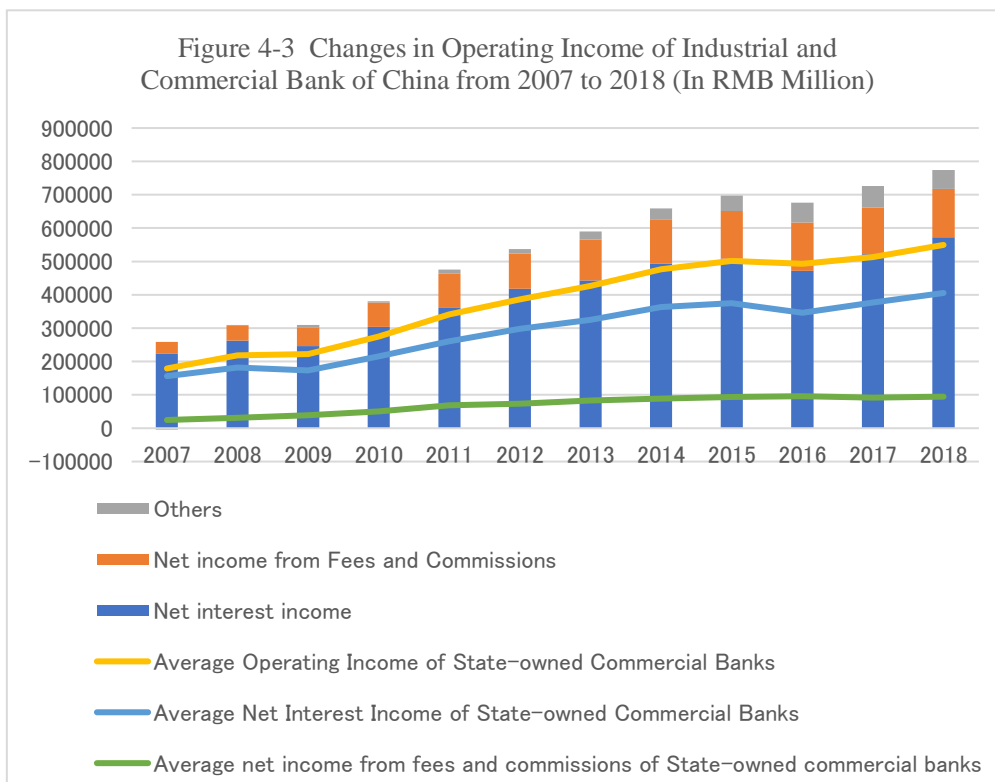
rose continuously from 8% to 27%, which means that good financial services will become a new growth point and business development direction for commercial banks.

Table 4-7 Operating Income of Sample Banks from 2007 to 2018 (In RMB Million)

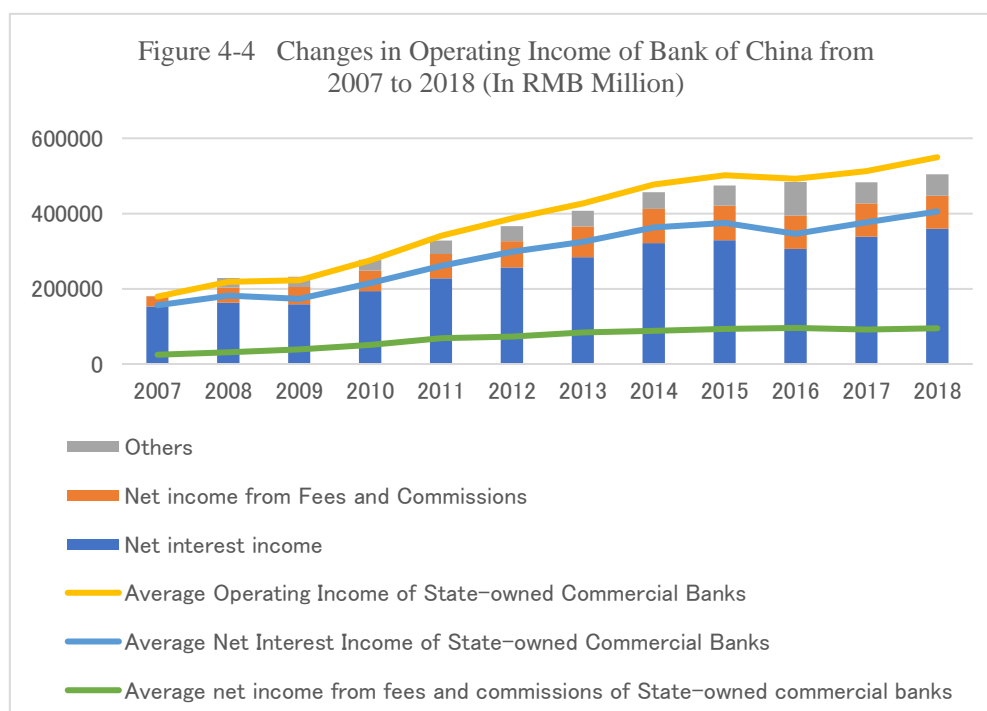
| | | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|--------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Industrial and Commercial Bank of China | Operating income | 254,157 | 309,758 | 309,454 | 380,821 | 475,214 | 536,945 | 589,637 | 658,892 | 697,647 | 675,891 | 726,502 | 773,789 |
| | Net interest income | 224,465 | 263,037 | 245,821 | 303,749 | 362,764 | 417,828 | 443,335 | 493,522 | 507,867 | 471,846 | 522,078 | 572,518 |
| | Net income from fees and commissions | 34,384 | 44,002 | 55,147 | 72,840 | 101,550 | 106,064 | 122,326 | 132,497 | 143,391 | 144,973 | 139,625 | 145,301 |
| Bank of China | Operating income | 180,669 | 228,288 | 232,198 | 276,817 | 328,166 | 366,091 | 407,508 | 456,331 | 474,321 | 483,630 | 483,278 | 504,107 |
| | Net interest income | 152,745 | 162,936 | 158,881 | 193,962 | 228,064 | 256,964 | 283,585 | 321,102 | 328,650 | 306,048 | 338,389 | 359,706 |
| | Net income from fees and commissions | 27,488 | 39,947 | 46,013 | 54,483 | 64,662 | 69,923 | 82,092 | 91,240 | 92,410 | 88,664 | 88,691 | 87,208 |
| China Construction Bank | Operating income | 219,459 | 267,507 | 267,184 | 323,489 | 397,090 | 460,746 | 508,608 | 570,470 | 605,197 | 605,090 | 621,659 | 658,891 |
| | Net interest income | 192,775 | 224,920 | 211,885 | 251,500 | 304,572 | 353,202 | 389,544 | 437,398 | 457,752 | 417,799 | 452,456 | 486,278 |
| | Net income from fees and commissions | 31,313 | 38,446 | 48,059 | 66,132 | 86,994 | 93,507 | 104,283 | 108,517 | 113,530 | 118,509 | 117,798 | 123,035 |
| Agricultural Bank of China | Operating income | 179,237 | 211,189 | 222,274 | 290,418 | 377,731 | 421,964 | 462,625 | 520,858 | 536,168 | 506,016 | 537,041 | 598,588 |
| | Net interest income | 157,465 | 193,845 | 181,639 | 242,152 | 307,199 | 341,879 | 376,202 | 429,891 | 436,140 | 398,104 | 441,930 | 477,760 |
| | Net income from fees and commissions | 22,995 | 23,798 | 35,640 | 46,128 | 68,750 | 74,844 | 83,171 | 80,123 | 82,549 | 90,935 | 72,903 | 78,141 |
| Bank of Communications | Operating income | 62,322 | 76,660 | 80,937 | 104,234 | 126,956 | 147,337 | 164,435 | 177,401 | 193,828 | 193,129 | 196,011 | 212,654 |
| | Net interest income | 53,742 | 65,636 | 66,564 | 84,995 | 102,601 | 120,126 | 130,658 | 134,776 | 144,172 | 134,871 | 127,366 | 130,908 |
| | Net income from fees and commissions | 7,188 | 8,837 | 11,399 | 14,479 | 19,549 | 20,882 | 25,968 | 29,604 | 35,027 | 36,795 | 40,551 | 41,237 |
| China Merchants Bank | Operating income | 40,958 | 55,308 | 51,446 | 74,348 | 96,157 | 113,367 | 132,604 | 165,863 | 201,471 | 209,025 | 220,897 | 248,555 |
| | Net interest income | 33,902 | 46,885 | 40,364 | 57,076 | 76,307 | 88,374 | 98,913 | 112,000 | 136,729 | 134,595 | 144,852 | 160,384 |
| | Net income from fees and commissions | 6,439 | 7,744 | 7,993 | 11,330 | 15,628 | 19,739 | 29,184 | 44,696 | 53,419 | 60,865 | 64,018 | 66,480 |
| Ping An Bank | Operating income | 10,808 | 14,513 | 15,114 | 18,022 | 29,643 | 39,749 | 52,189 | 73,407 | 96,163 | 107,715 | 105,786 | 116,716 |
| | Net interest income | 9,606 | 12,598 | 12,984 | 15,829 | 25,290 | 33,035 | 40,688 | 53,046 | 66,099 | 76,411 | 74,009 | 74,745 |
| | Net income from fees and commissions | 521 | 851 | 1,181 | 1,585 | 3,665 | 5,721 | 10,456 | 17,378 | 26,445 | 27,859 | 30,674 | 31,297 |

| | | | | | | | | | | | | | |
|----------------------------------|--------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Shanghai Pudong Development Bank | Operating income | 25,876 | 34,561 | 36,824 | 49,856 | 67,918 | 82,952 | 100,015 | 123,181 | 146,550 | 160,792 | 168,619 | 171,542 |
| | Net interest income | 24,180 | 31,534 | 33,538 | 45,204 | 61,442 | 73,362 | 85,177 | 98,183 | 113,009 | 108,120 | 106,912 | 111,844 |
| | Net income from fees and commissions | 1,129 | 1,795 | 2,207 | 4,049 | 6,716 | 8,746 | 13,904 | 21,346 | 27,798 | 40,692 | 45,580 | 39,009 |
| China Minsheng Bank | Operating income | 25,301 | 35,017 | 42,060 | 54,768 | 82,368 | 103,111 | 115,886 | 135,469 | 154,425 | 155,211 | 144,281 | 156,769 |
| | Net interest income | 22,580 | 30,380 | 32,240 | 45,873 | 64,821 | 77,153 | 83,033 | 92,136 | 94,268 | 94,684 | 86,552 | 76,680 |
| | Net income from fees and commissions | 2,391 | 4,461 | 4,664 | 8,289 | 15,101 | 20,523 | 29,956 | 38,239 | 51,205 | 52,261 | 47,742 | 48,131 |
| Huaxia Bank | Operating income | 14,260 | 17,611 | 17,130 | 24,479 | 33,544 | 39,777 | 45,219 | 54,885 | 58,844 | 64,025 | 66,384 | 72,227 |
| | Net interest income | 11,247 | 13,492 | 15,807 | 22,760 | 30,293 | 35,344 | 38,902 | 46,241 | 46,083 | 48,989 | 47,318 | 51,538 |
| | Net income from fees and commissions | 451 | 823 | 1,024 | 1,445 | 2,976 | 4,046 | 6,312 | 7,652 | 12,372 | 14,656 | 18,407 | 17,758 |
| China Everbright Bank | Operating income | 20,044 | 24,701 | 24,259 | 35,530 | 46,073 | 59,916 | 65,306 | 78,531 | 93,159 | 94,037 | 91,850 | 110,244 |
| | Net interest income | 17,772 | 22,336 | 19,602 | 30,422 | 39,440 | 50,263 | 50,862 | 58,259 | 66,459 | 65,288 | 60,950 | 61,043 |
| | Net income from fees and commissions | 1,190 | 2,174 | 3,157 | 4,709 | 6,973 | 9,479 | 14,952 | 19,157 | 26,301 | 28,112 | 30,774 | 36,894 |
| CITIC Bank | Operating income | 27,838 | 40,155 | 40,801 | 55,765 | 76,948 | 89,435 | 104,558 | 124,716 | 145,134 | 153,781 | 156,708 | 164,854 |
| | Net interest income | 26,170 | 36,091 | 35,984 | 48,135 | 65,106 | 75,486 | 85,688 | 94,741 | 104,433 | 106,138 | 99,645 | 104,772 |
| | Net income from fees and commissions | 2,080 | 3,045 | 4,220 | 5,696 | 8,837 | 11,210 | 16,811 | 25,313 | 35,674 | 42,280 | 46,858 | 45,148 |
| Average of state-owned banks | Operating income | 179,169 | 218,680 | 222,409 | 275,156 | 341,031 | 386,617 | 426,563 | 476,790 | 501,432 | 492,751 | 512,898 | 549,606 |
| | Net interest income | 156,238 | 182,075 | 172,958 | 215,272 | 261,040 | 298,000 | 324,665 | 363,338 | 374,916 | 345,734 | 376,444 | 405,434 |
| | Net income from fees and commissions | 24,674 | 31,006 | 39,252 | 50,812 | 68,301 | 73,044 | 83,568 | 88,396 | 93,381 | 95,975 | 91,914 | 94,984 |
| Average of non-state-owned banks | Operating income | 23,584 | 31,695 | 32,519 | 44,681 | 61,807 | 75,472 | 87,968 | 108,007 | 127,964 | 134,941 | 136,361 | 148,701 |
| | Net interest income | 20,780 | 27,617 | 27,217 | 37,900 | 51,814 | 61,860 | 69,038 | 79,229 | 89,583 | 90,604 | 88,605 | 91,572 |
| | Net income from fees and commissions | 2,029 | 2,985 | 3,492 | 5,300 | 8,556 | 11,352 | 17,368 | 24,826 | 33,316 | 38,104 | 40,579 | 40,674 |

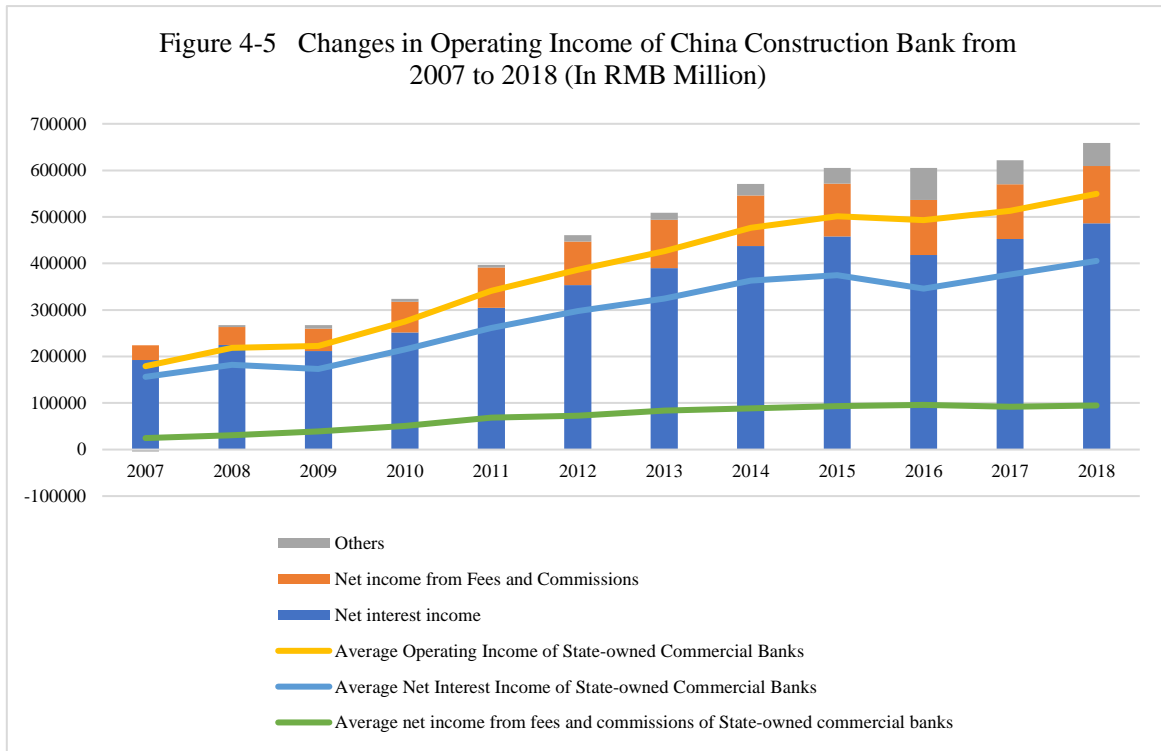
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



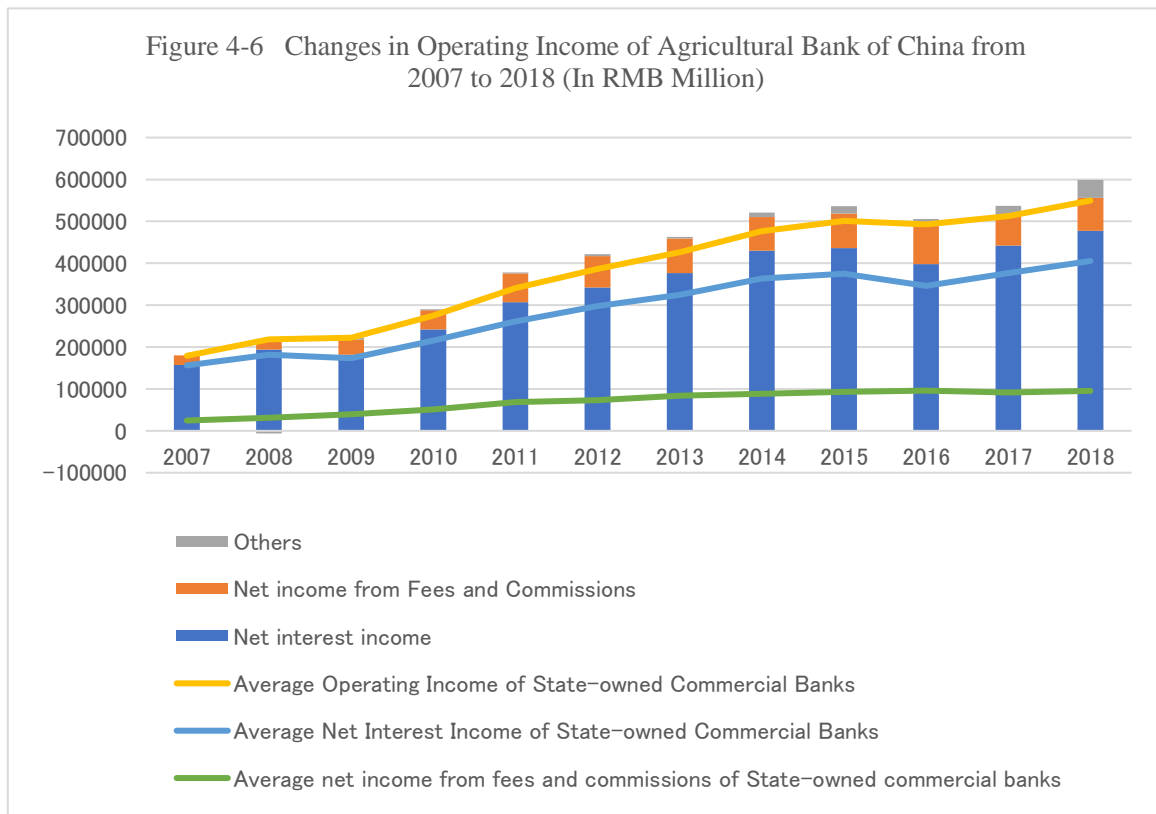
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



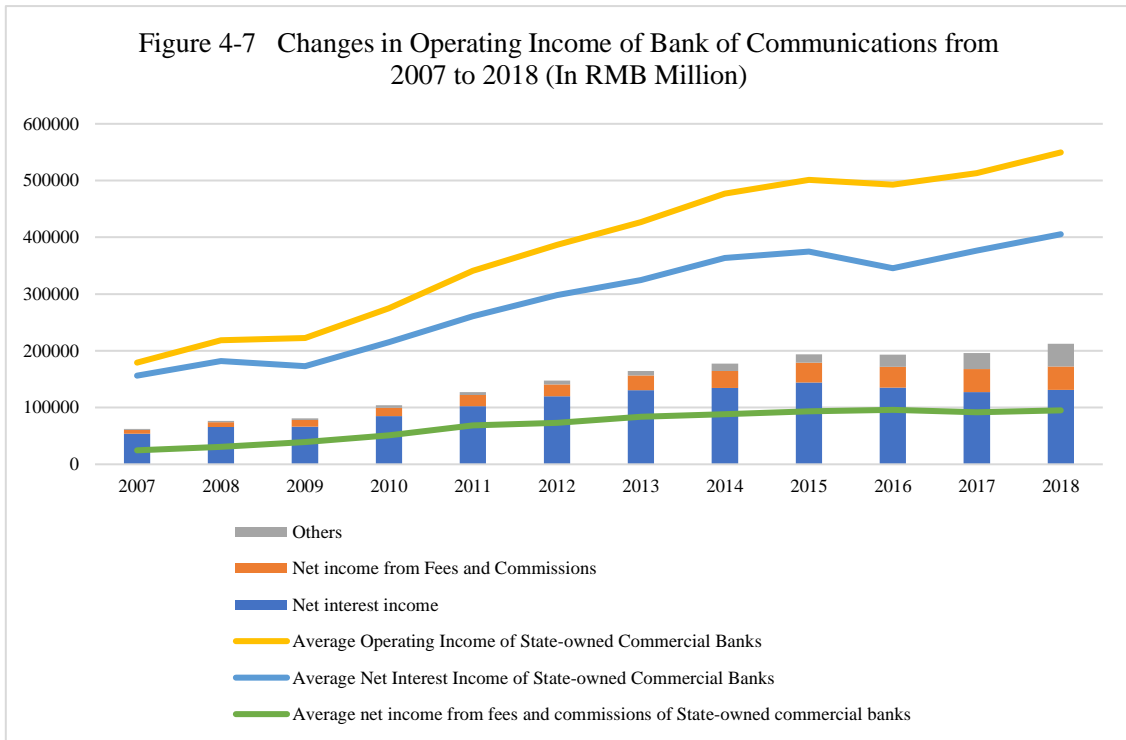
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



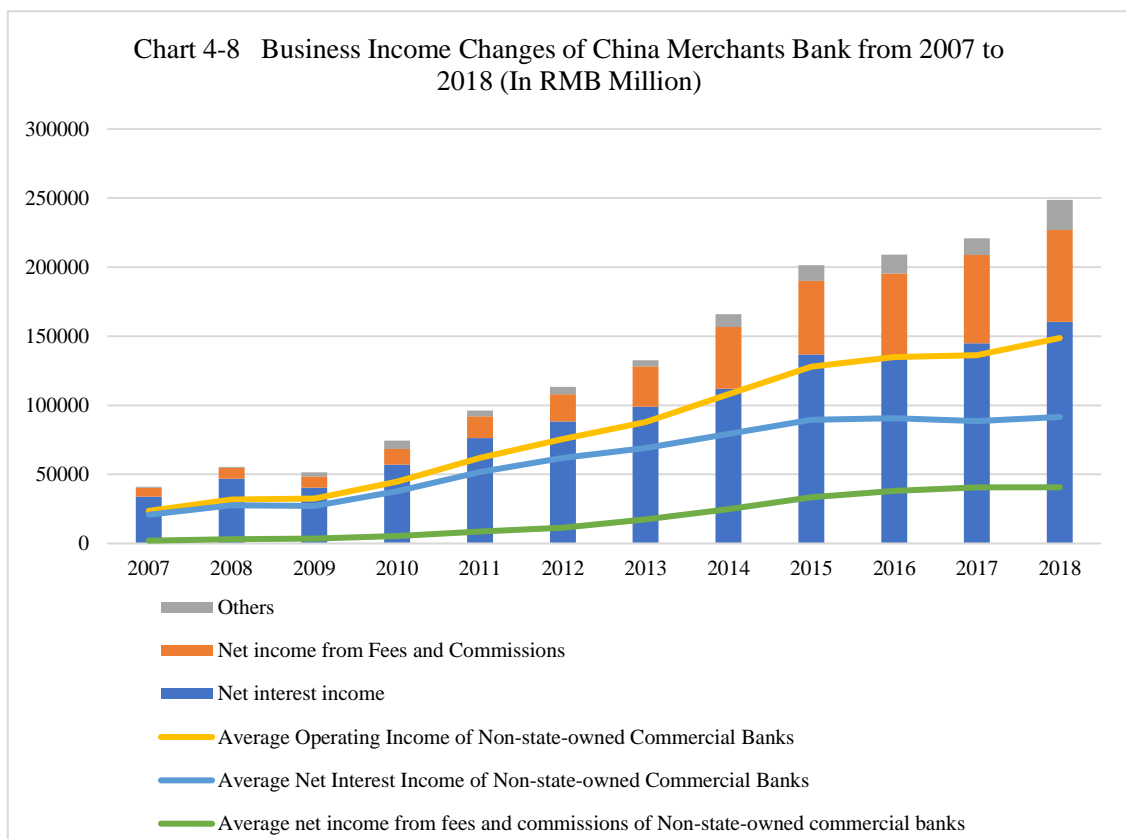
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



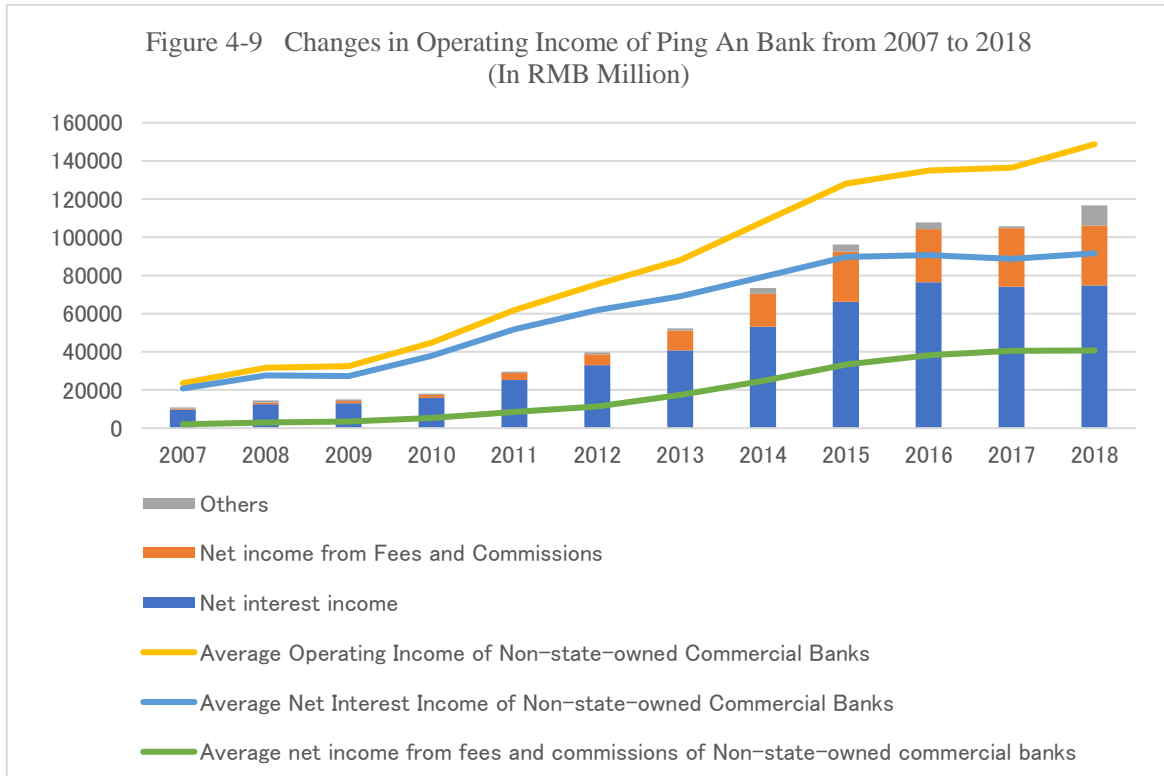
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



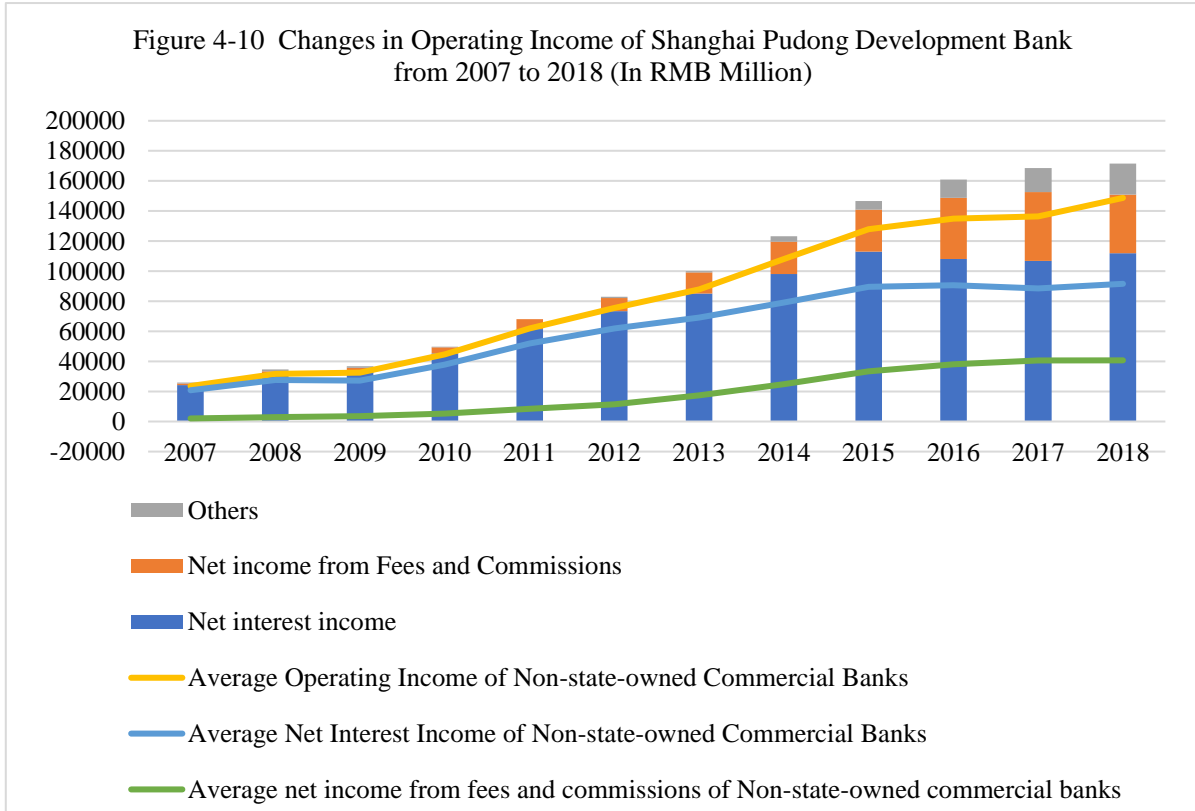
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.

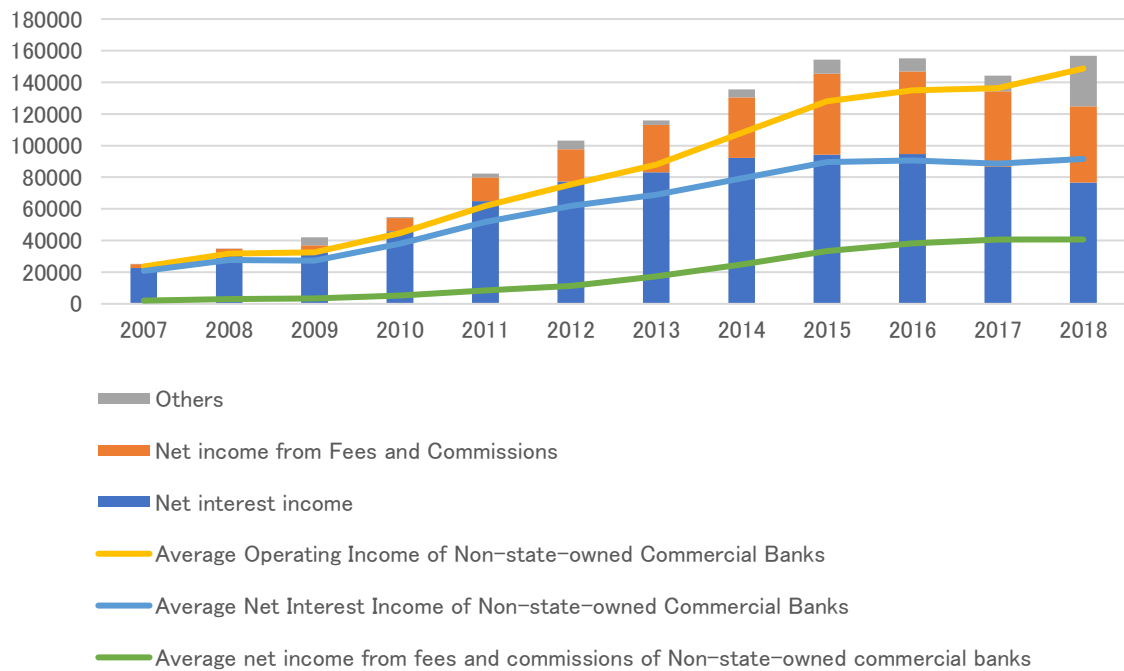


Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



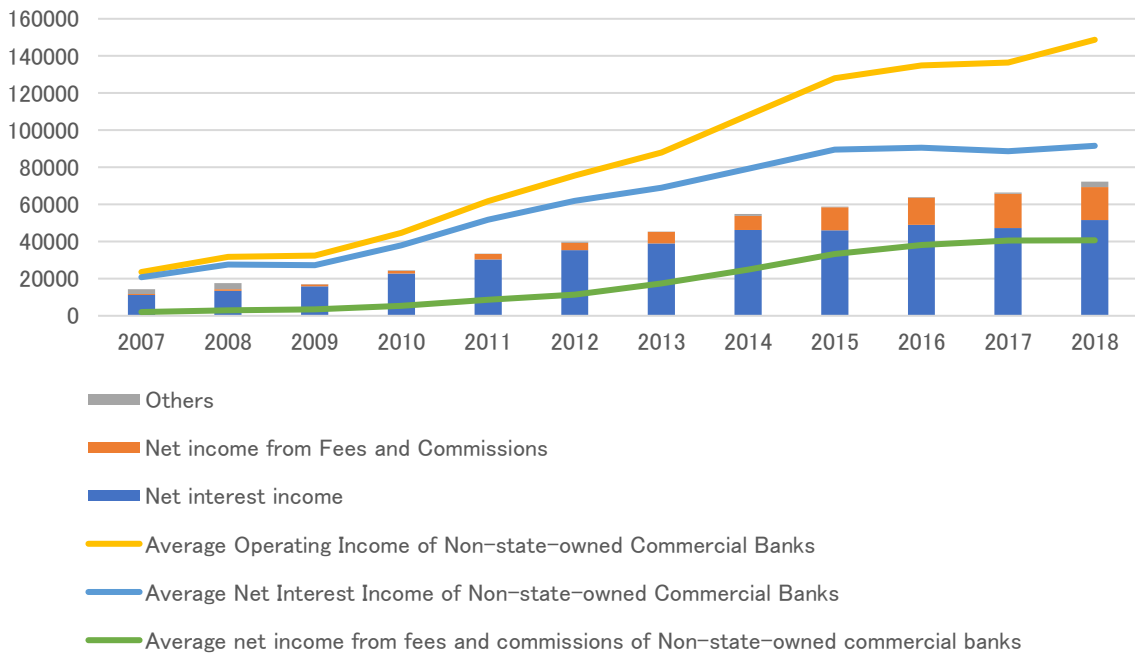
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.

Figure 4-11 Changes in Operating Income of China Minsheng Bank from 2007 to 2018 (In RMB Million)



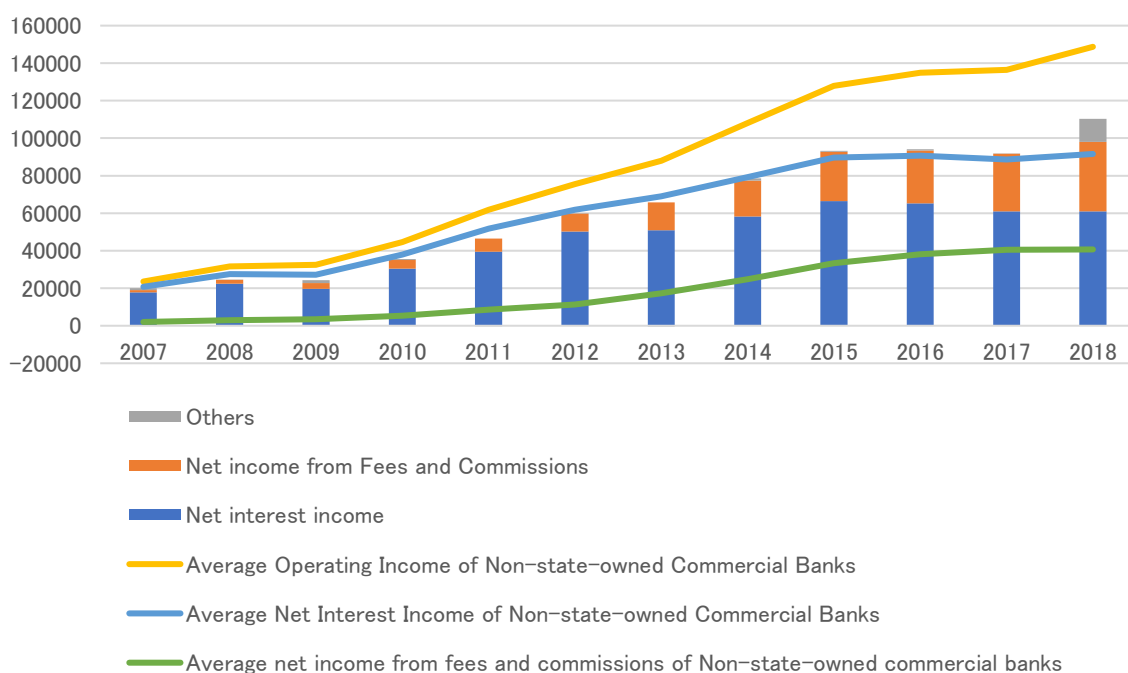
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.

Figure 4-12 Changes in Operating Income of Huaxia Bank from 2007 to 2018 (In RMB Million)



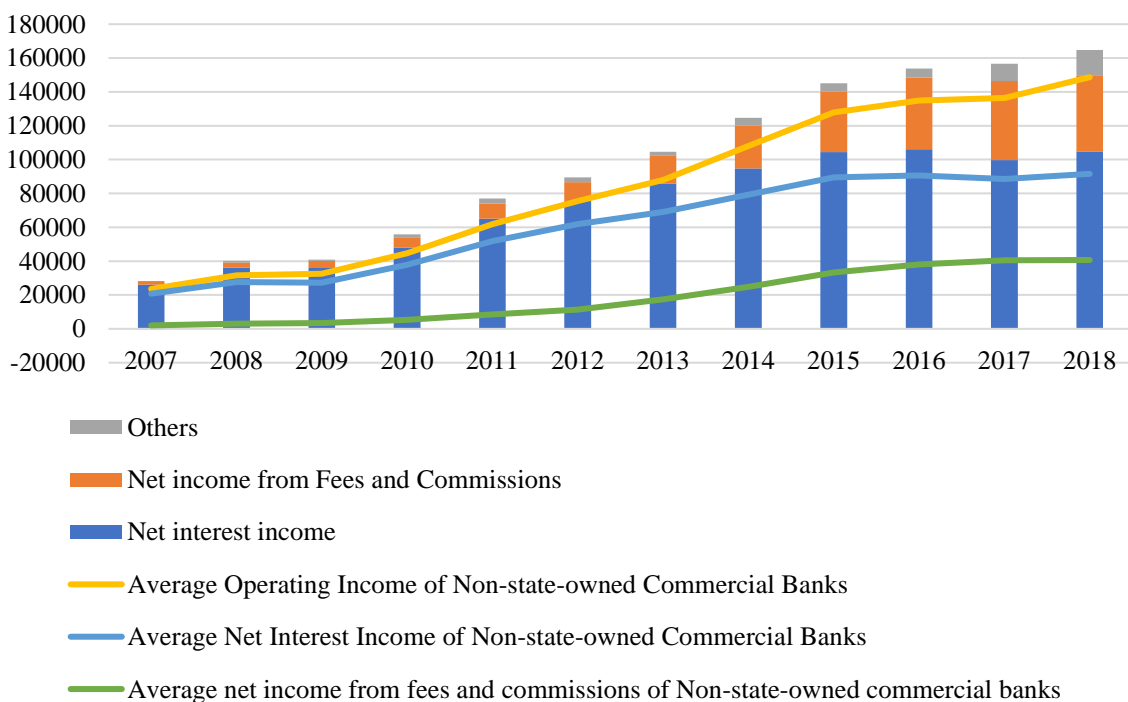
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.

Figure 4-13 Changes in Operating Income of China Everbright Bank from 2007 to 2018 (In RMB Million)

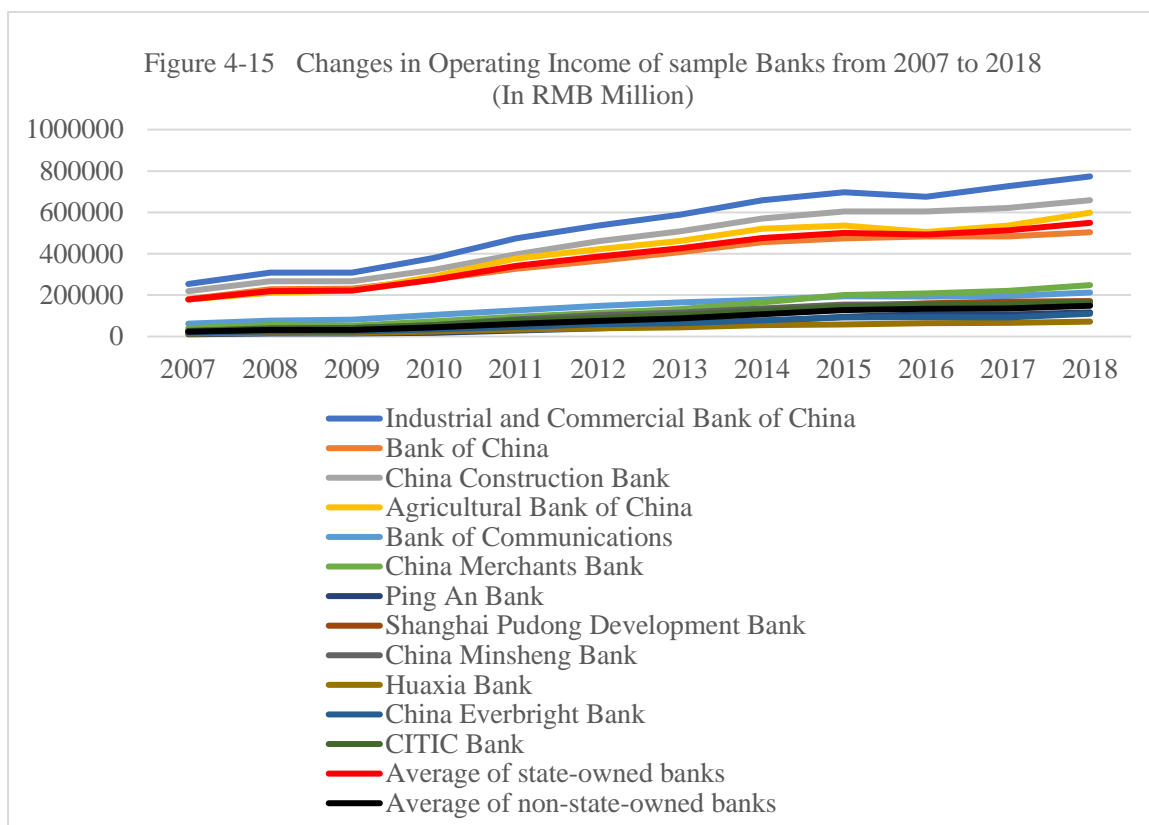


Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.

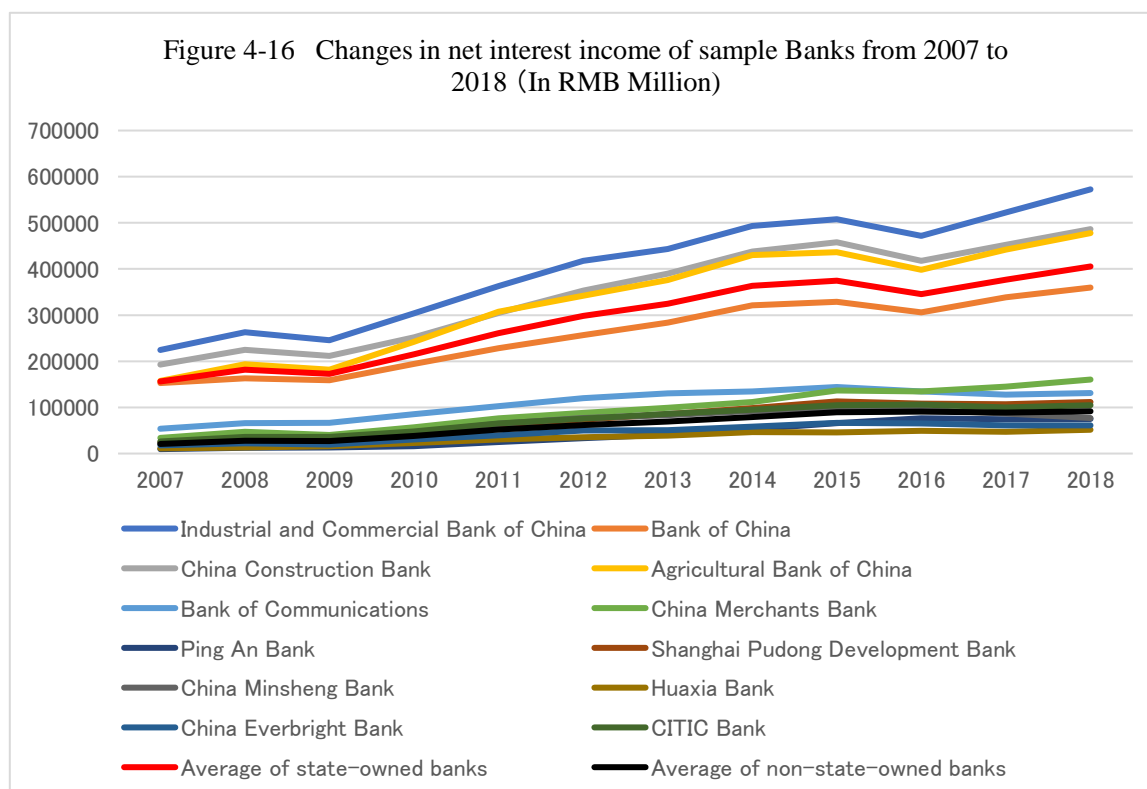
Figure 4-14 Changes in Operating Income of CITIC Bank from 2007 to 2018 (In RMB Million)



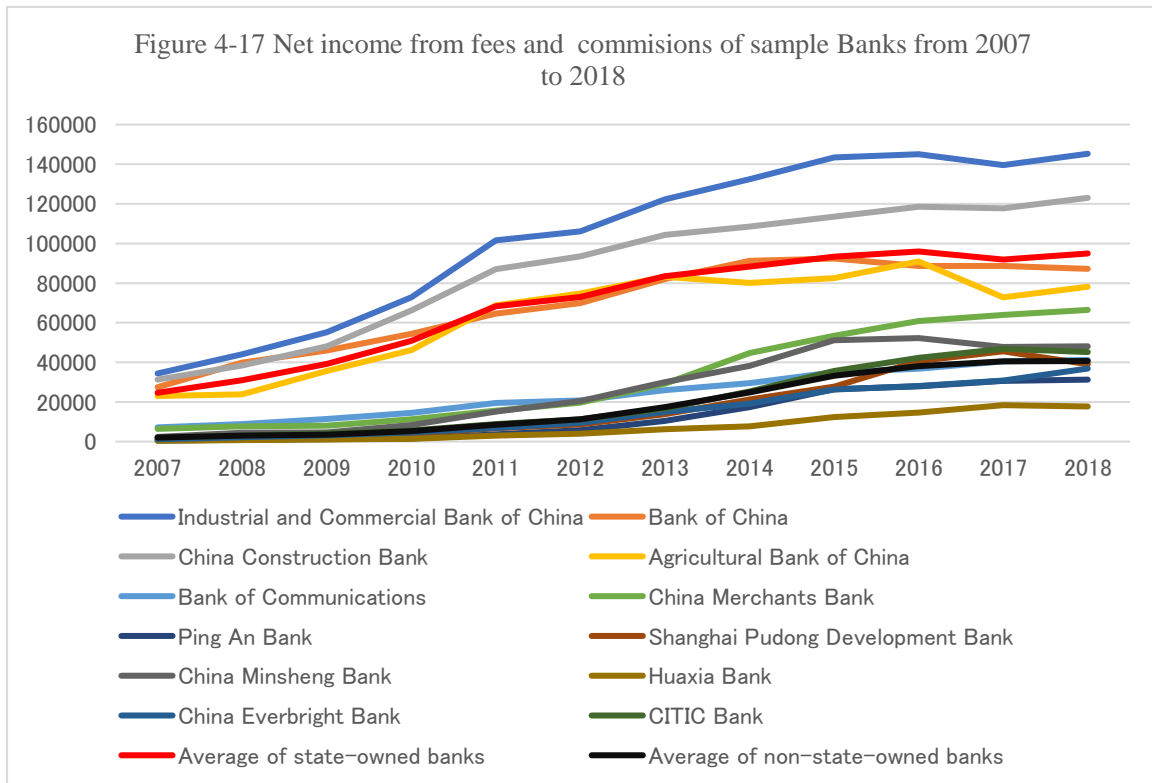
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks



Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks



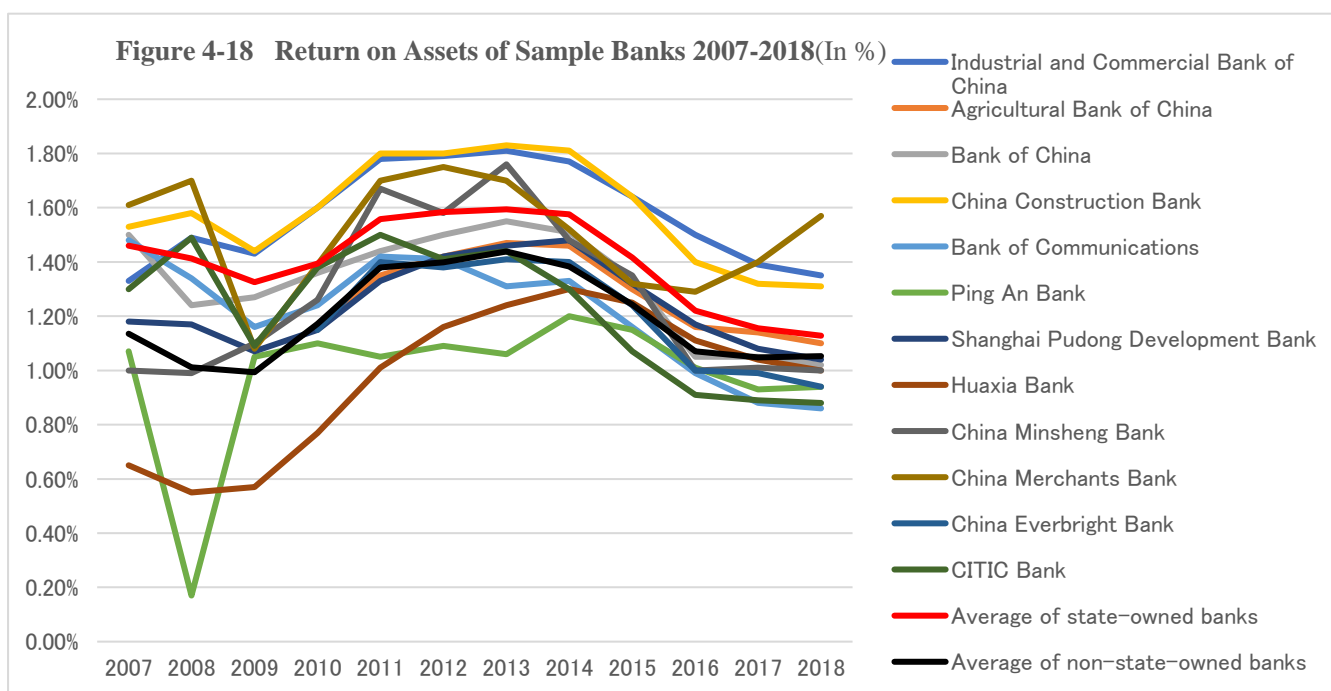
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks

Return on Assets Ratio refers to the level of return on all assets of commercial banks and is an important indicator to measure the profitability of commercial banks. Except Ping An Bank, there is no obvious fluctuation in other commercial banks. On the whole, the return on assets of the sample banks showed an overall trend of increase first and then decrease during the sample period. Judging from the average value, the return on assets of state-owned commercial banks is still higher than that of non-state-owned commercial banks, indicating that state-owned commercial banks still have advantages in terms of profitability.

Table 4-8 Return on Assets Ratio of Sample Banks from 2007 to 2018 (In %)

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|
| Industrial and Commercial Bank of China | 1.33 | 1.49 | 1.43 | 1.60 | 1.78 | 1.79 | 1.81 | 1.77 | 1.64 | 1.50 | 1.39 | 1.35 |
| Agricultural Bank of China | | | | 1.17 | 1.35 | 1.42 | 1.47 | 1.46 | 1.30 | 1.16 | 1.14 | 1.10 |
| Bank of China | 1.50 | 1.24 | 1.27 | 1.36 | 1.44 | 1.50 | 1.55 | 1.51 | 1.34 | 1.05 | 1.05 | 1.02 |
| China Construction Bank | 1.53 | 1.58 | 1.44 | 1.60 | 1.80 | 1.80 | 1.83 | 1.81 | 1.64 | 1.40 | 1.32 | 1.31 |
| Bank of Communications | 1.48 | 1.34 | 1.16 | 1.24 | 1.42 | 1.41 | 1.31 | 1.33 | 1.16 | 0.99 | 0.88 | 0.86 |
| Ping An Bank | 1.07 | 0.17 | 1.05 | 1.10 | 1.05 | 1.09 | 1.06 | 1.20 | 1.15 | 1.01 | 0.93 | 0.94 |
| Shanghai Pudong Development Bank | 1.18 | 1.17 | 1.07 | 1.15 | 1.33 | 1.42 | 1.46 | 1.48 | 1.32 | 1.17 | 1.08 | 1.04 |
| Huaxia Bank | 0.65 | 0.55 | 0.57 | 0.77 | 1.01 | 1.16 | 1.24 | 1.30 | 1.25 | 1.11 | 1.04 | 1.00 |
| China Minsheng Bank | 1.00 | 0.99 | 1.10 | 1.26 | 1.67 | 1.58 | 1.76 | 1.48 | 1.35 | 1.00 | 1.01 | 1.00 |
| China Merchants Bank | 1.61 | 1.70 | 1.08 | 1.39 | 1.70 | 1.75 | 1.70 | 1.52 | 1.32 | 1.29 | 1.40 | 1.57 |
| China Everbright Bank | | | | 1.15 | 1.40 | 1.38 | 1.41 | 1.40 | 1.24 | 1.00 | 0.99 | 0.94 |
| CITIC Bank | 1.30 | 1.49 | 1.09 | 1.38 | 1.50 | 1.41 | 1.44 | 1.30 | 1.07 | 0.91 | 0.89 | 0.88 |
| Average of state-owned banks | 1.46 | 1.41 | 1.33 | 1.39 | 1.56 | 1.58 | 1.59 | 1.58 | 1.42 | 1.22 | 1.16 | 1.13 |
| Average of non-state-owned banks | 1.14 | 1.01 | 0.99 | 1.17 | 1.38 | 1.40 | 1.44 | 1.38 | 1.24 | 1.07 | 1.05 | 1.05 |

Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



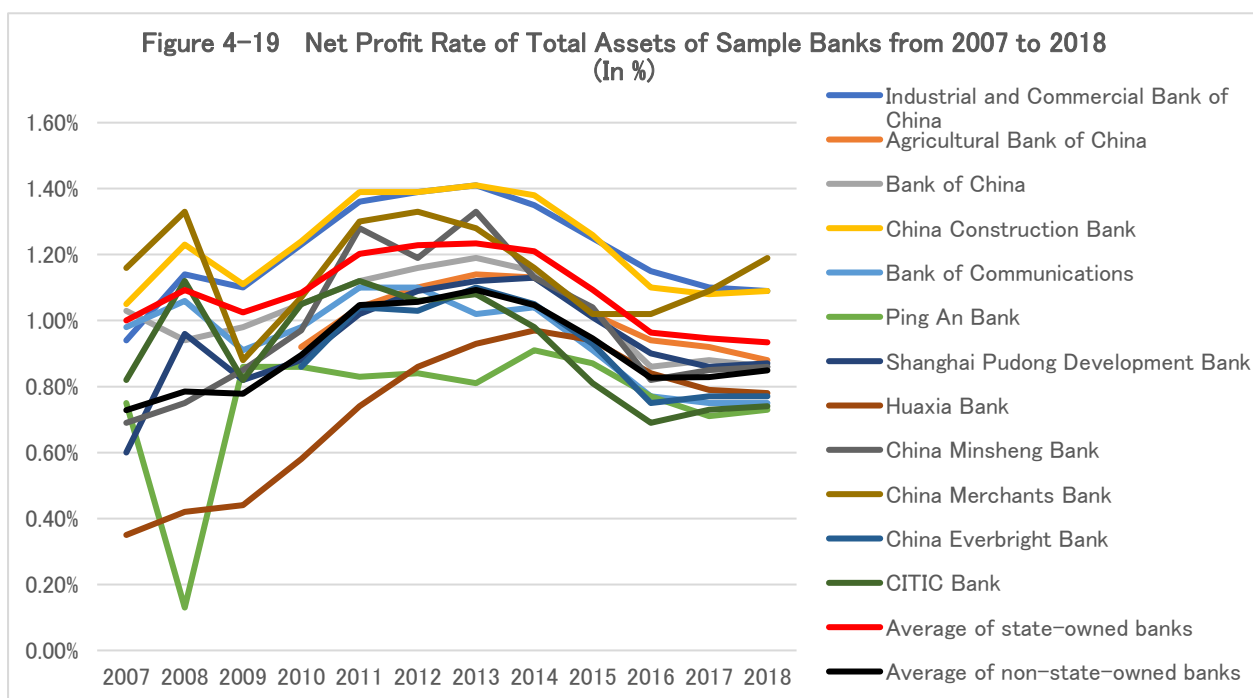
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks

Net Profit Rate of Total Assets is the ratio of a bank's net profit to its total average assets in a certain period of time. The higher the net profit rate of assets, the stronger the profitability of the bank to use all its assets. The lower the net profit rate of assets, the weaker the bank's profitability of using all assets. Judging from the average value, state-owned commercial banks are better than non-state-owned commercial banks in their ability to make profits from their assets. From an individual point of view, China Merchants Bank's net profit margin on total assets in 2018 exceeded that of Industrial and Commercial Bank of China and China Construction Bank in state-owned commercial banks, reaching 1.19%.

Table 4-9 Net Profit Rate of Total Assets of Sample Banks from 2007 to 2018 (In %)

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|
| Industrial and Commercial Bank of China | 0.94 | 1.14 | 1.10 | 1.23 | 1.36 | 1.39 | 1.41 | 1.35 | 1.25 | 1.15 | 1.10 | 1.09 |
| Agricultural Bank of China | | | | 0.92 | 1.04 | 1.10 | 1.14 | 1.13 | 1.02 | 0.94 | 0.92 | 0.88 |
| Bank of China | 1.03 | 0.94 | 0.98 | 1.05 | 1.12 | 1.16 | 1.19 | 1.15 | 1.03 | 0.86 | 0.88 | 0.86 |
| China Construction Bank | 1.05 | 1.23 | 1.11 | 1.24 | 1.39 | 1.39 | 1.41 | 1.38 | 1.26 | 1.10 | 1.08 | 1.09 |
| Bank of Communications | 0.98 | 1.06 | 0.91 | 0.98 | 1.10 | 1.10 | 1.02 | 1.04 | 0.91 | 0.77 | 0.75 | 0.75 |
| Ping An Bank | 0.75 | 0.13 | 0.86 | 0.86 | 0.83 | 0.84 | 0.81 | 0.91 | 0.87 | 0.77 | 0.71 | 0.73 |
| Shanghai Pudong Development Bank | 0.60 | 0.96 | 0.82 | 0.88 | 1.02 | 1.09 | 1.12 | 1.13 | 1.01 | 0.90 | 0.86 | 0.87 |
| Huaxia Bank | 0.35 | 0.42 | 0.44 | 0.58 | 0.74 | 0.86 | 0.93 | 0.97 | 0.94 | 0.84 | 0.79 | 0.78 |
| China Minsheng Bank | 0.69 | 0.75 | 0.85 | 0.97 | 1.28 | 1.19 | 1.33 | 1.13 | 1.04 | 0.82 | 0.85 | 0.86 |
| China Merchants Bank | 1.16 | 1.33 | 0.88 | 1.07 | 1.30 | 1.33 | 1.28 | 1.16 | 1.02 | 1.02 | 1.09 | 1.19 |
| China Everbright Bank | | | | 0.86 | 1.04 | 1.03 | 1.10 | 1.05 | 0.93 | 0.75 | 0.77 | 0.77 |
| CITIC Bank | 0.82 | 1.12 | 0.82 | 1.05 | 1.12 | 1.06 | 1.08 | 0.98 | 0.81 | 0.69 | 0.73 | 0.74 |
| Average of state-owned banks | 1.00 | 1.09 | 1.03 | 1.08 | 1.20 | 1.23 | 1.23 | 1.21 | 1.09 | 0.96 | 0.95 | 0.93 |
| Average of non-state-owned banks | 0.73 | 0.79 | 0.78 | 0.90 | 1.05 | 1.06 | 1.09 | 1.05 | 0.95 | 0.83 | 0.83 | 0.85 |

Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.

The bank's operating costs are all the expenses incurred by the bank in its financial operations, and are the main components of the bank's total costs. This part can see the trend of cost control and expenditure of commercial banks within the scope of business, which is helpful for profitability analysis. The operating costs of commercial Banks are mainly composed of interest expenses, fees and commission expenses, operating expenses and non-operating expenses.

Table 4-10 Operating costs of Sample Banks from 2007 to 2018 (In RMB Million)

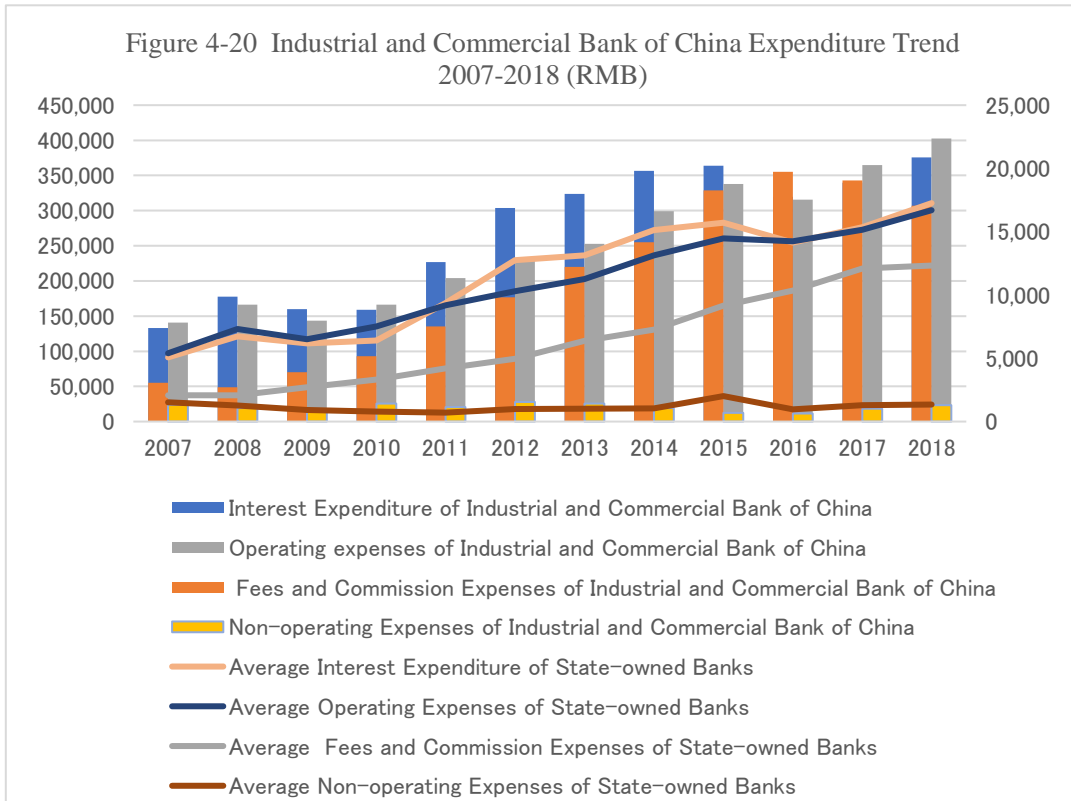
| | | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Industrial and Commercial Bank of China | Interest expense | 132,822 | 177,537 | 160,057 | 159,013 | 226,816 | 303,611 | 323,776 | 356,357 | 363,912 | 319,634 | 339,516 | 375,576 |
| | Fees and Commission Expenses | 3,055 | 2,709 | 3,895 | 5,168 | 7,527 | 9,817 | 12,224 | 14,181 | 18,279 | 19,741 | 19,041 | 17,046 |
| | Operating expenses | 140,972 | 166,227 | 143,460 | 166,334 | 204,214 | 229,487 | 252,591 | 299,280 | 338,112 | 315,576 | 364,660 | 402,602 |
| | Non-operating expenses | 1,331 | 1,064 | 959 | 1,418 | 1,140 | 1,538 | 1,419 | 1,062 | 692 | 637 | 1,006 | 1,303 |
| Bank of China | Interest expense | 109,126 | 123,991 | 102,543 | 119,571 | 185,038 | 249,564 | 235,410 | 281,578 | 286,406 | 260,091 | 284,227 | 328,194 |
| | Fees and Commission Expenses | 4,066 | 3,765 | 4,221 | 4,731 | 5,356 | 5,275 | 6,493 | 7,298 | 8,495 | 9,655 | 12,109 | 12,789 |
| | Operating expenses | 92,462 | 142,135 | 121,640 | 134,654 | 159,627 | 178,786 | 195,317 | 225,412 | 243,945 | 263,619 | 261,049 | 275,622 |
| | Non-operating expenses | -- | 1,145 | 655 | 748 | 543 | 623 | 507 | 757 | 730 | 522 | 971 | 651 |
| China Construction Bank | Interest expense | 92,048 | 131,580 | 127,578 | 126,283 | 177,675 | 250,039 | 256,709 | 301,728 | 312,807 | 278,838 | 297,698 | 324,748 |
| | Fees and Commission Expenses | 1,418 | 1,610 | 1,780 | 2,024 | 2,500 | 2,711 | 3,149 | 3,721 | 7,874 | 9,354 | 13,524 | 14,982 |
| | Operating expenses | 118,924 | 148,900 | 129,582 | 149,785 | 179,418 | 210,460 | 230,636 | 273,223 | 309,107 | 312,701 | 323,473 | 350,377 |
| | Non-operating expenses | 1,151 | 1,287 | 1,248 | 973 | 1,001 | 788 | 903 | 1,321 | 1,518 | 1,436 | 2,382 | 1,424 |
| Agricultural Bank of China | Interest expense | 85,852 | 121,852 | 114,508 | 115,508 | 165,722 | 224,184 | 237,182 | 269,398 | 289,653 | 259,086 | 271,769 | 306,964 |
| | Fees and Commission Expenses | 926 | 996 | 1,645 | 2,016 | 2,774 | 3,729 | 6,526 | 7,760 | 7,945 | 9,884 | 12,354 | 13,384 |
| | Operating expenses | 101,790 | 159,118 | 148,532 | 170,988 | 220,993 | 234,993 | 249,613 | 289,914 | 303,297 | 281,421 | 301,683 | 348,372 |

| | | | | | | | | | | | | | |
|----------------------------------|------------------------------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|
| | Non-operating expenses | 3,404 | 2,535 | 1,177 | 531 | 562 | 2,044 | 1,984 | 1,955 | 6,693 | 2,074 | 1,751 | 2,489 |
| Bank of Communications | Interest expense | 36,376 | 51,244 | 50,075 | 56,910 | 88,271 | 120,470 | 128,634 | 153,733 | 160,954 | 154,973 | 190,152 | 217,956 |
| | Fees and Commission Expenses | 968 | 1,284 | 2,015 | 2,597 | 2,915 | 3,244 | 3,437 | 3,310 | 3,204 | 3,089 | 3,509 | 3,436 |
| | Operating expenses | 31,472 | 40,877 | 42,718 | 54,534 | 62,060 | 72,957 | 84,919 | 93,559 | 108,116 | 107,779 | 112,938 | 126,134 |
| | Non-operating expenses | 217 | 308 | 504 | 255 | 282 | 15 | 242 | 140 | 430 | 173 | 317 | 854 |
| China Merchants Bank | Interest expense | 17,683 | 25,750 | 25,474 | 27,437 | 44,938 | 61,727 | 74,582 | 110,834 | 97,993 | 80,886 | 97,153 | 110,527 |
| | Fees and Commission Expenses | 819 | 1,032 | 1,160 | 1,079 | 1,296 | 1,428 | 2,181 | 3,847 | 4,379 | 5,138 | 5,890 | 6,566 |
| | Operating expenses | 20,043 | 28,896 | 29,533 | 38,413 | 49,544 | 54,254 | 64,693 | 93,094 | 127,223 | 131,307 | 130,357 | 141,947 |
| | Non-operating expenses | 125 | 62 | 63 | 91 | 77 | 71 | 117 | 148 | 139 | 141 | 203 | 375 |
| Ping An Bank | Interest expense | 8,438 | 13,867 | 9,001 | 10,423 | 27,041 | 41,578 | 52,414 | 66,156 | 65,550 | 54,708 | 74,059 | 88,143 |
| | Fees and Commission Expenses | 147 | 205 | 206 | 251 | 465 | 728 | 1,365 | 2,328 | 2,740 | 3,450 | 5,051 | 8,065 |
| | Operating expenses | 5,032 | 6,376 | 7,380 | 8,685 | 14,362 | 19,076 | 25,344 | 32,150 | 36,783 | 31,418 | 32,638 | 36,540 |
| | Non-operating expenses | 40 | 63 | 24 | 17 | 50 | 88 | 26 | 92 | 89 | 65 | 104 | 102 |
| Shanghai Pudong Development Bank | Interest expense | 14,263 | 24,187 | 26,652 | 27,763 | 59,780 | 76,881 | 92,627 | 113,832 | 115,245 | 106,694 | 138,906 | 155,644 |
| | Fees and Commission Expenses | 474 | 540 | 513 | 413 | 489 | 575 | 669 | 975 | 1,515 | 2,544 | 5,193 | 7,196 |
| | Operating expenses | 15,114 | 19,229 | 19,646 | 24,784 | 32,161 | 38,533 | 46,492 | 61,430 | 80,483 | 91,132 | 98,344 | 106,199 |
| | Non-operating expenses | 35 | 50 | 54 | 39 | 75 | 99 | 118 | 164 | 173 | 144 | 644 | 163 |
| China Minsheng Bank | Interest expense | 17,490 | 25,931 | 21,201 | 24,903 | 52,460 | 74,734 | 99,121 | 106,916 | 109,114 | 109,234 | 144,358 | 158,667 |

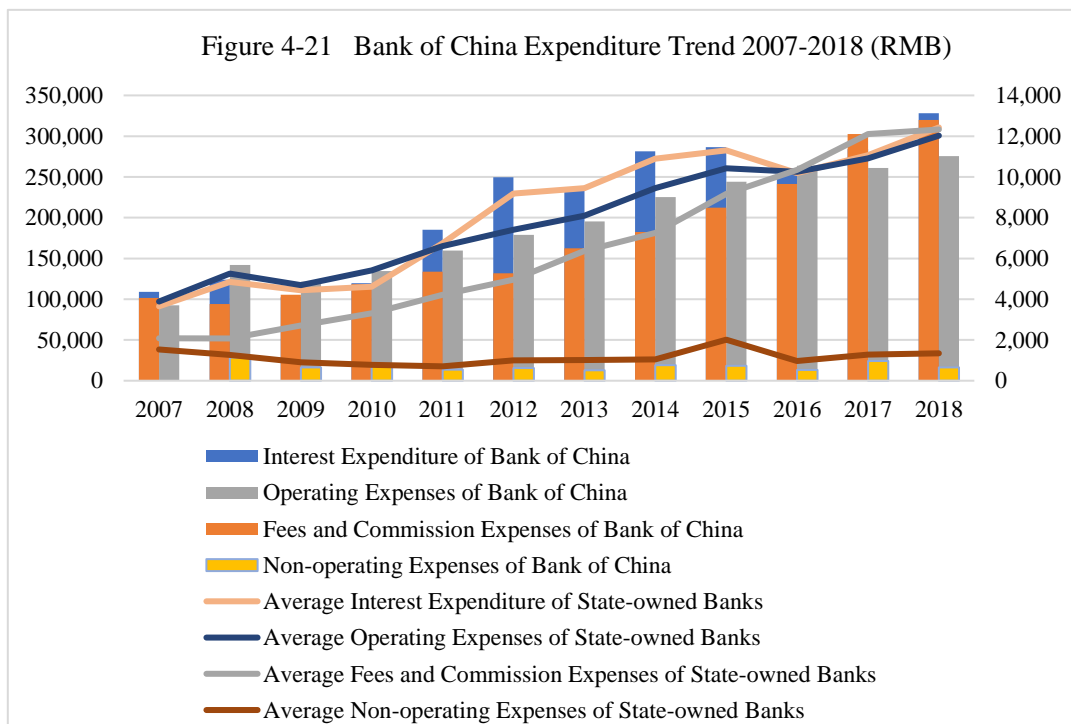
| | | | | | | | | | | | | | |
|------------------------------|------------------------------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | Fees and Commission Expenses | 274 | 294 | 342 | 464 | 890 | 1,568 | 3,105 | 4,054 | 3,902 | 4,005 | 6,326 | 4,553 |
| | Operating expenses | 16,102 | 24,605 | 26,455 | 31,757 | 45,083 | 52,379 | 59,083 | 75,990 | 94,175 | 95,045 | 83,432 | 97,478 |
| | Non-operating expenses | 47 | 81 | 146 | 169 | 324 | 651 | 400 | 536 | 140 | 492 | 369 | 553 |
| Huaxia Bank | Interest expense | 11,630 | 20,910 | 16,699 | 20,608 | 32,243 | 38,051 | 37,351 | 48,121 | 45,241 | 39,253 | 52,914 | 64,498 |
| | Fees and Commission Expenses | 262 | 241 | 279 | 347 | 419 | 398 | 549 | 1,029 | 1,063 | 1,468 | 2,040 | 2,371 |
| | Operating expenses | 10,405 | 13,577 | 12,318 | 16,451 | 21,020 | 22,576 | 24,559 | 30,994 | 33,910 | 37,906 | 40,267 | 45,539 |
| | Non-operating expenses | 67 | 51 | 36 | 79 | 34 | 28 | 25 | 60 | 60 | 48 | 71 | 72 |
| China Everbright Bank | Interest expense | 13,333 | 20,769 | 17,822 | 23,733 | 38,444 | 53,708 | 69,220 | 75,667 | 75,448 | 78,162 | 99,393 | 107,524 |
| | Fees and Commission Expenses | 488 | 433 | 376 | 372 | 408 | 515 | 810 | 1,288 | 1,444 | 1,820 | 2,251 | 2,658 |
| | Operating expenses | 11,579 | 16,572 | 13,736 | 18,549 | 21,925 | 28,405 | 31,021 | 40,115 | 53,919 | 54,100 | 51,269 | 69,254 |
| | Non-operating expenses | 136 | 285 | 82 | 73 | 62 | 75 | 85 | 102 | 87 | 85 | 103 | 280 |
| CITIC Bank | Interest expense | 15,324 | 22,776 | 20,147 | 24,325 | 41,517 | 63,324 | 77,647 | 110,898 | 111,228 | 107,336 | 121,117 | 129,021 |
| | Fees and Commission Expenses | 285 | 408 | 498 | 612 | 644 | 984 | 1,507 | 1,659 | 1,965 | 3,080 | 4,829 | 5,591 |
| | Operating expenses | 14,735 | 22,540 | 21,679 | 27,796 | 35,523 | 47,931 | 52,273 | 70,312 | 90,497 | 99,152 | 104,339 | 110,327 |
| | Non-operating expenses | 80 | 86 | 71 | 91 | 65 | 152 | 102 | 157 | 142 | 408 | 337 | 467 |
| Average of state-owned banks | Interest expense | 91,245 | 121,241 | 110,952 | 115,457 | 168,704 | 229,574 | 236,342 | 272,559 | 282,746 | 254,524 | 276,672 | 310,688 |
| | Fees and Commission Expenses | 2,087 | 2,073 | 2,711 | 3,307 | 4,214 | 4,955 | 6,366 | 7,254 | 9,159 | 10,345 | 12,107 | 12,327 |
| | Operating expenses | 97,124 | 131,451 | 117,186 | 135,259 | 165,262 | 185,337 | 202,615 | 236,278 | 260,515 | 256,219 | 272,761 | 300,621 |

| | | | | | | | | | | | | | |
|----------------------------------|------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|
| | Non-operating expenses | 1,526 | 1,268 | 909 | 785 | 706 | 1,002 | 1,011 | 1,047 | 2,013 | 968 | 1,285 | 1,344 |
| Average of non-state-owned banks | Interest expense | 14,023 | 22,027 | 19,571 | 22,742 | 42,346 | 58,572 | 71,852 | 90,346 | 88,546 | 82,325 | 103,986 | 116,289 |
| | Fees and Commission Expenses | 393 | 450 | 482 | 505 | 659 | 885 | 1,455 | 2,169 | 2,430 | 3,072 | 4,511 | 5,286 |
| | Operating expenses | 13,287 | 18,828 | 18,678 | 23,776 | 31,374 | 37,593 | 43,352 | 57,726 | 73,856 | 77,151 | 77,235 | 86,755 |
| | Non-operating expenses | 76 | 97 | 68 | 80 | 98 | 166 | 125 | 180 | 119 | 198 | 262 | 287 |

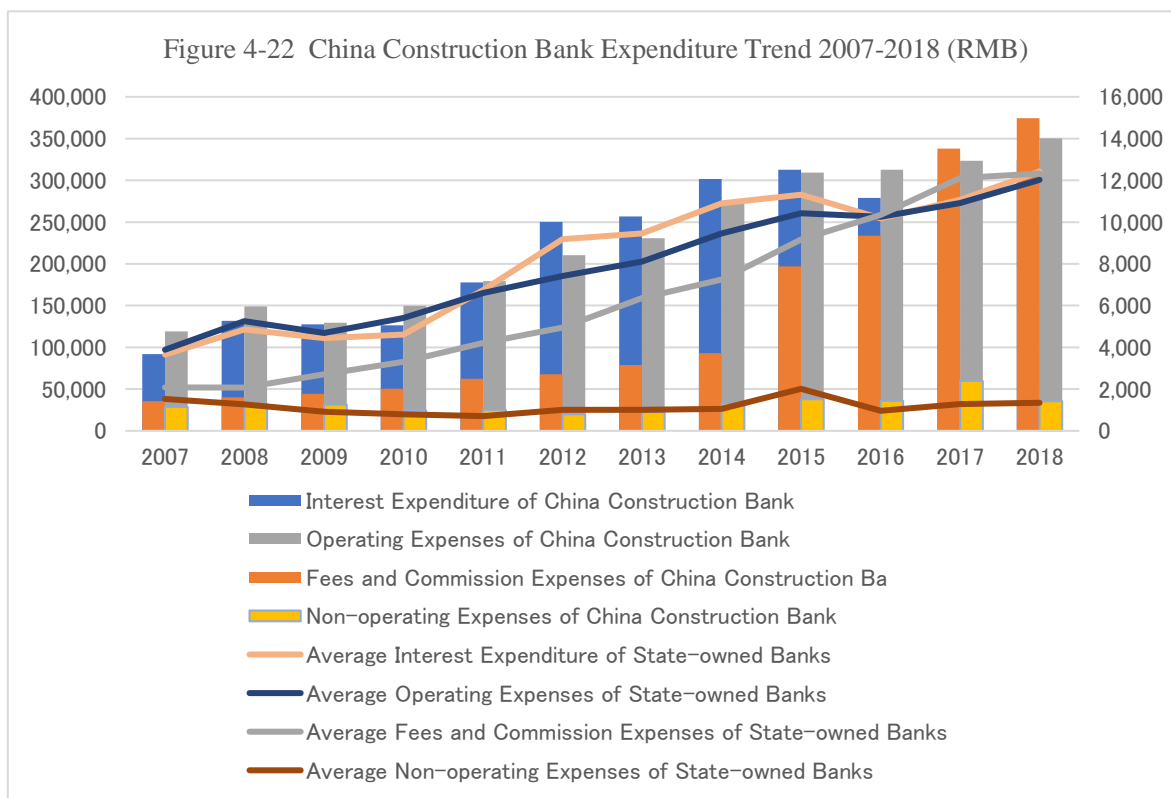
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



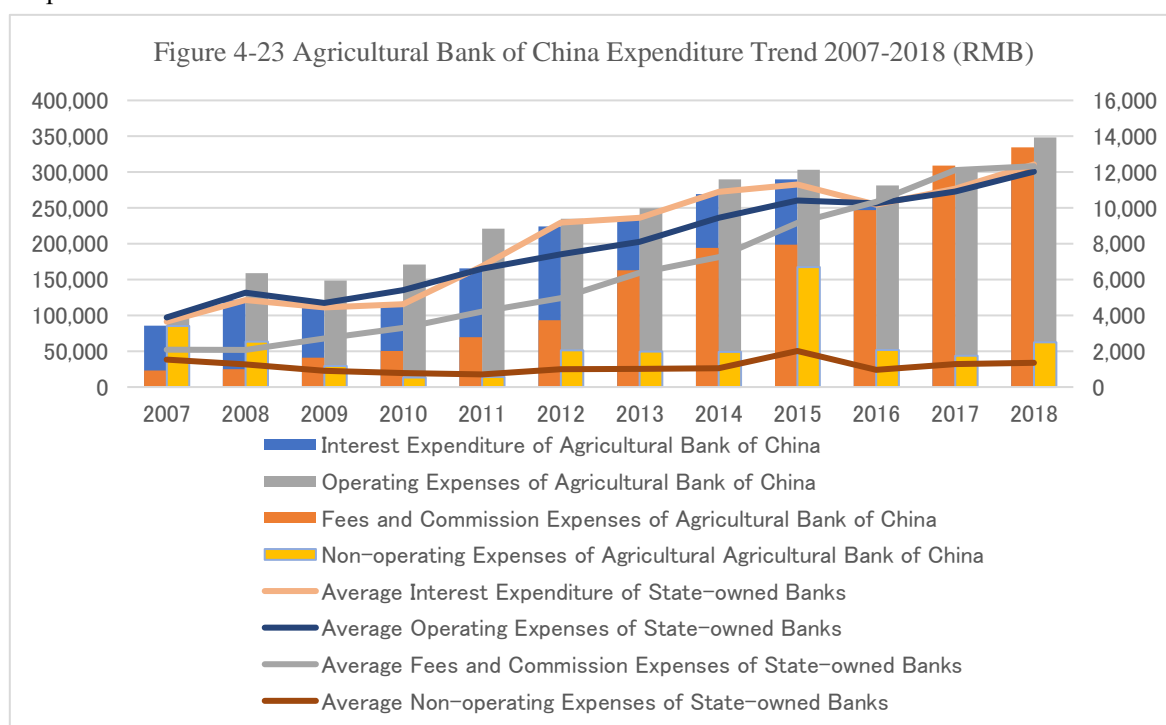
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



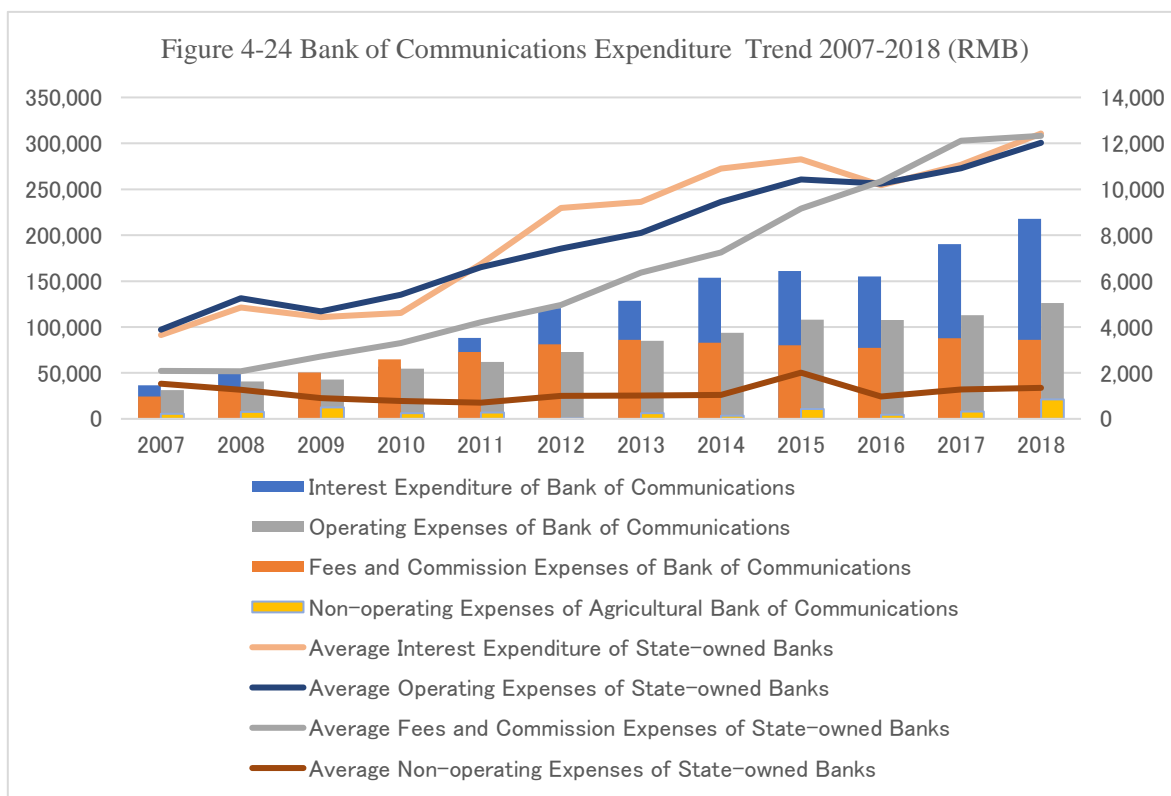
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



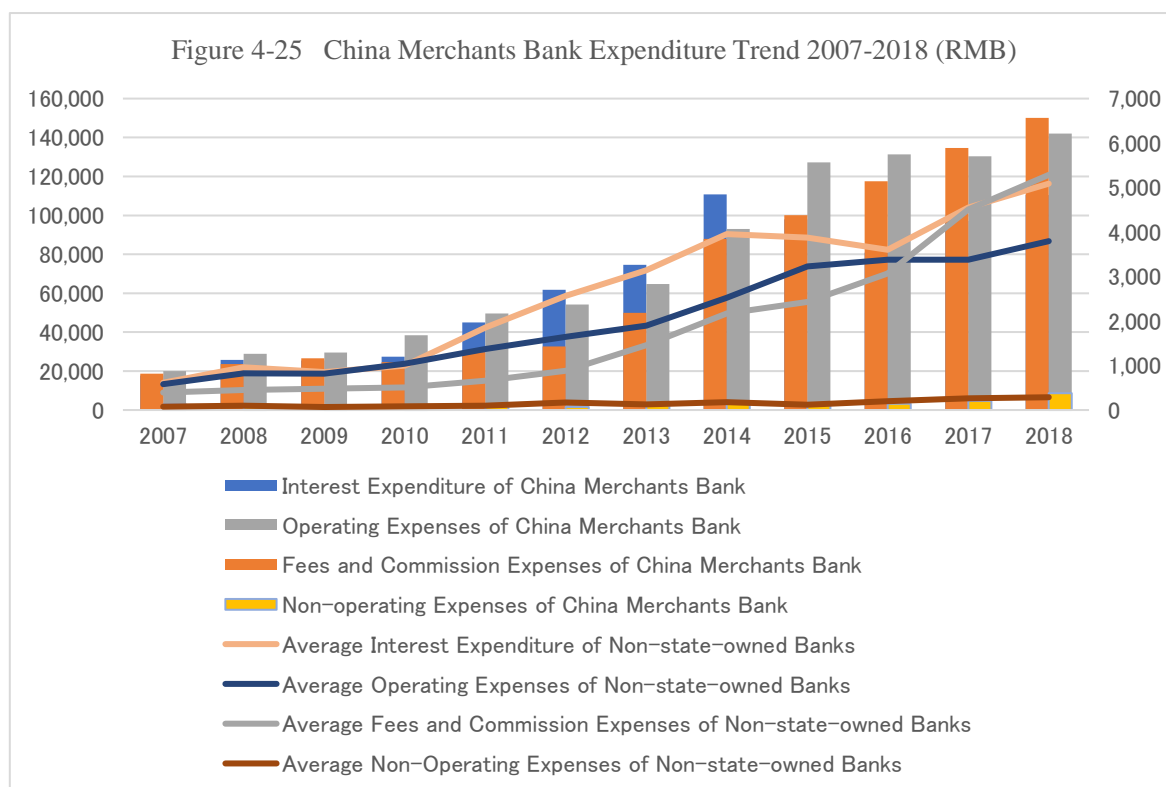
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



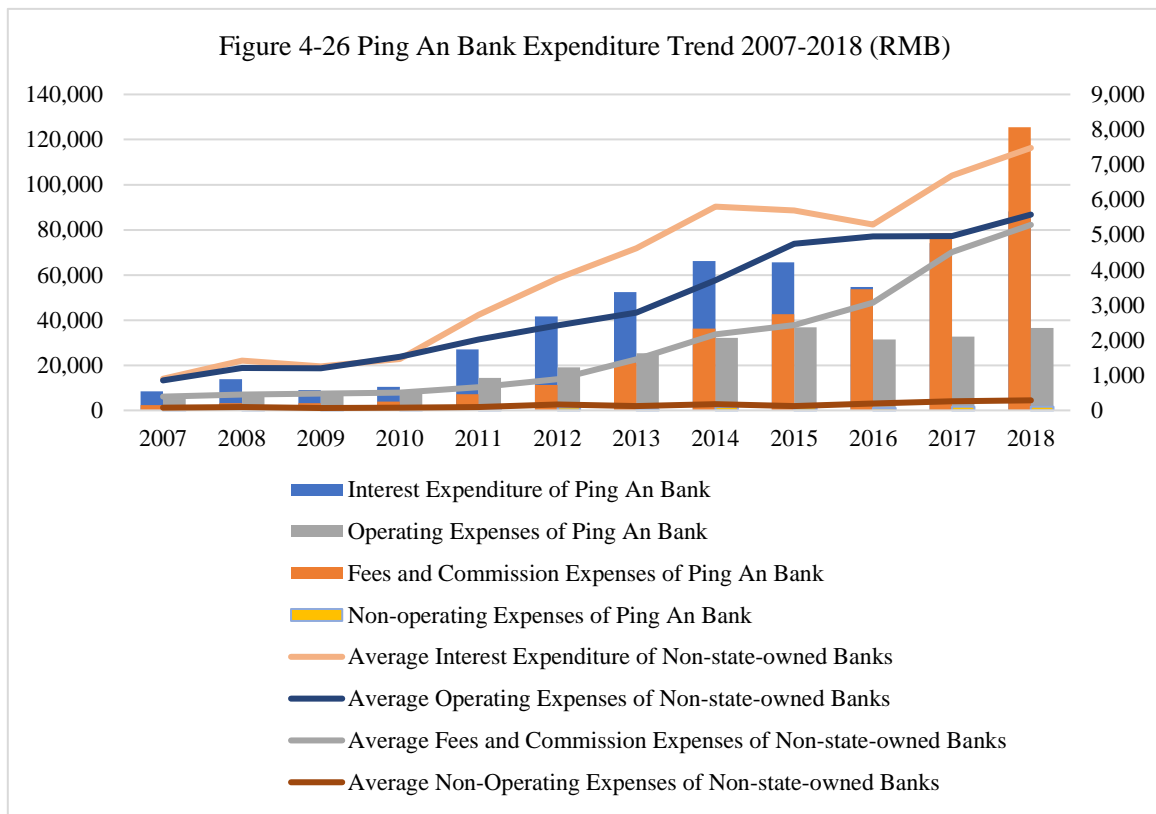
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



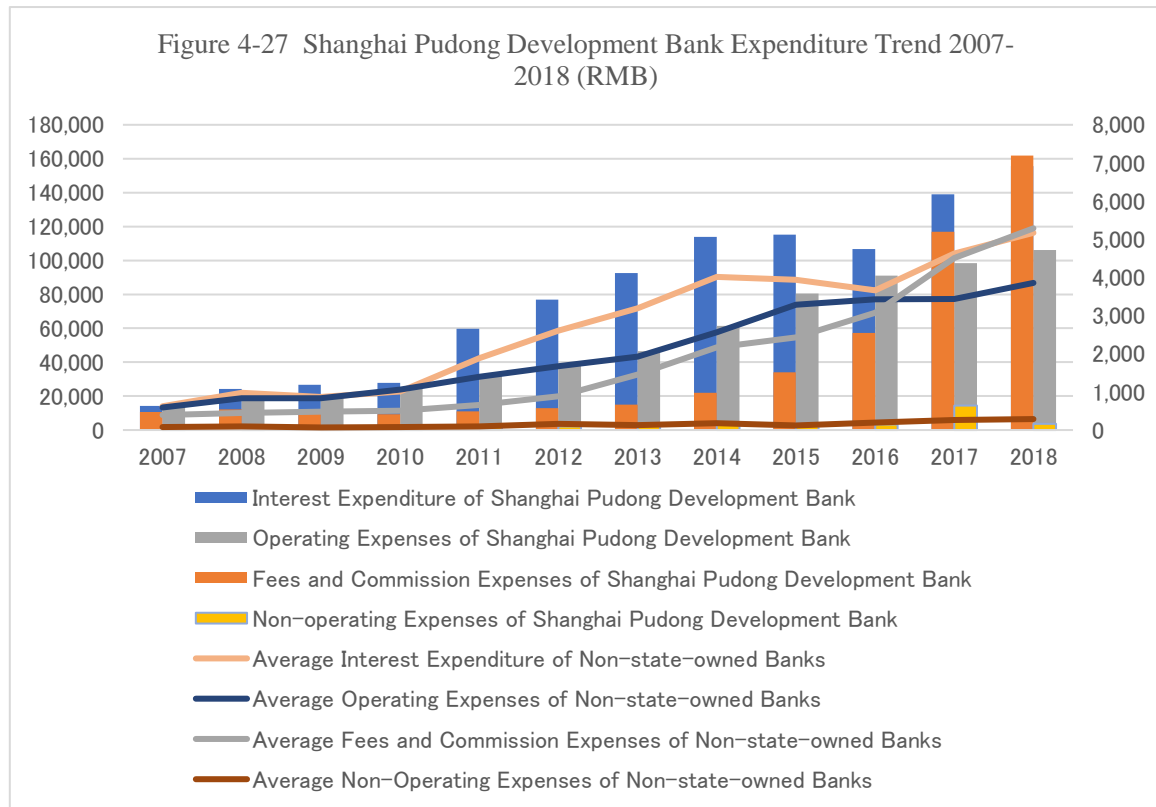
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



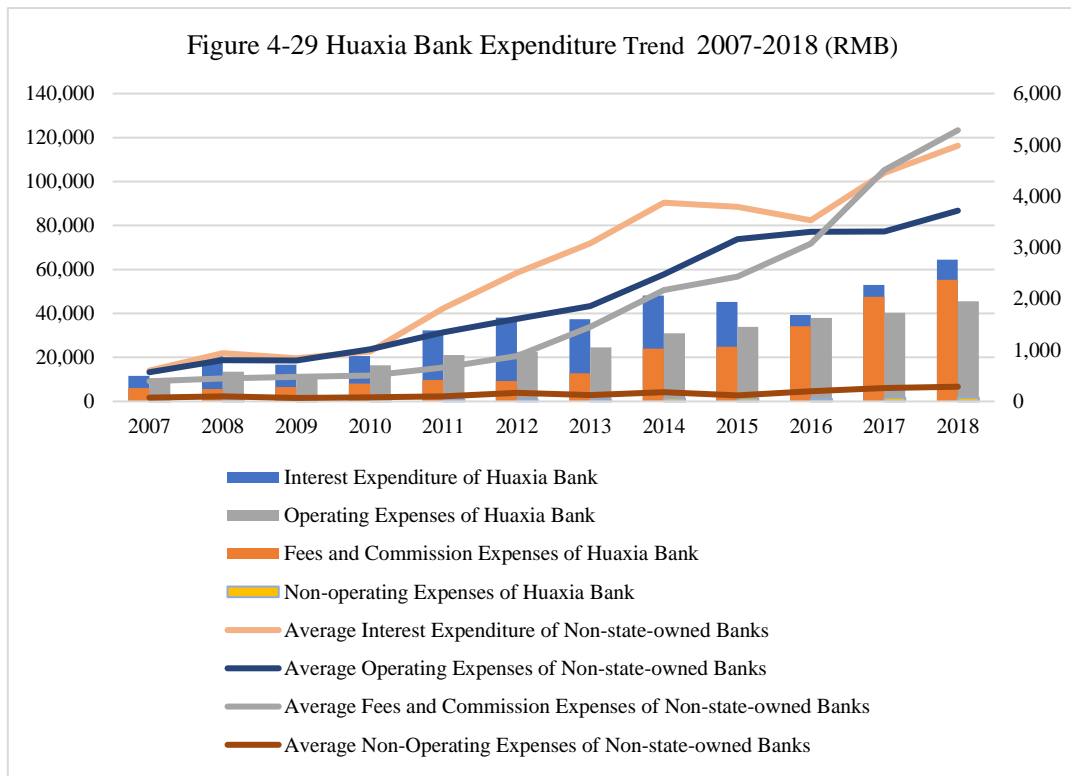
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



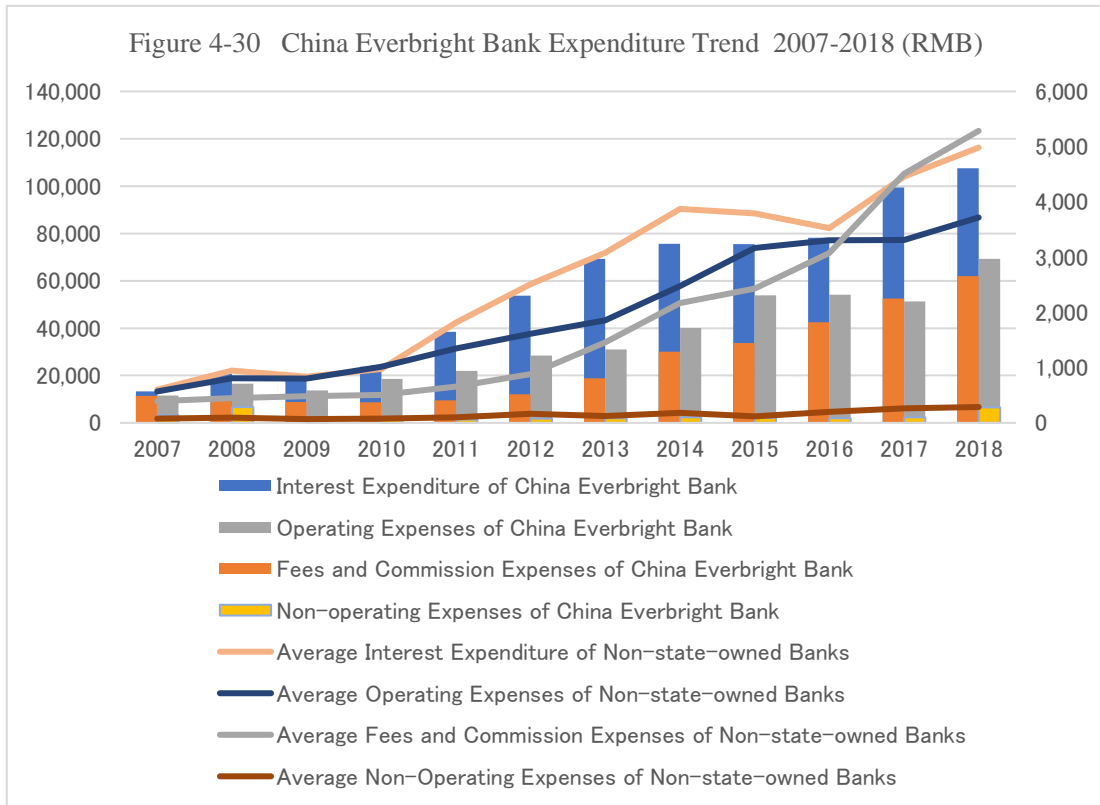
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



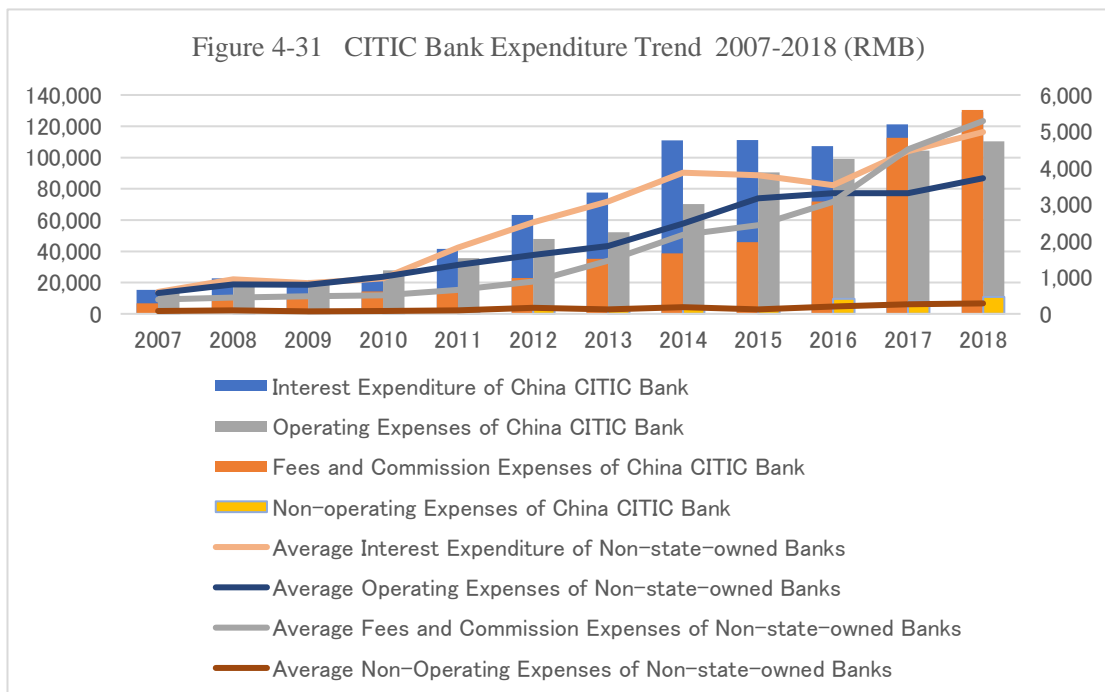
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.

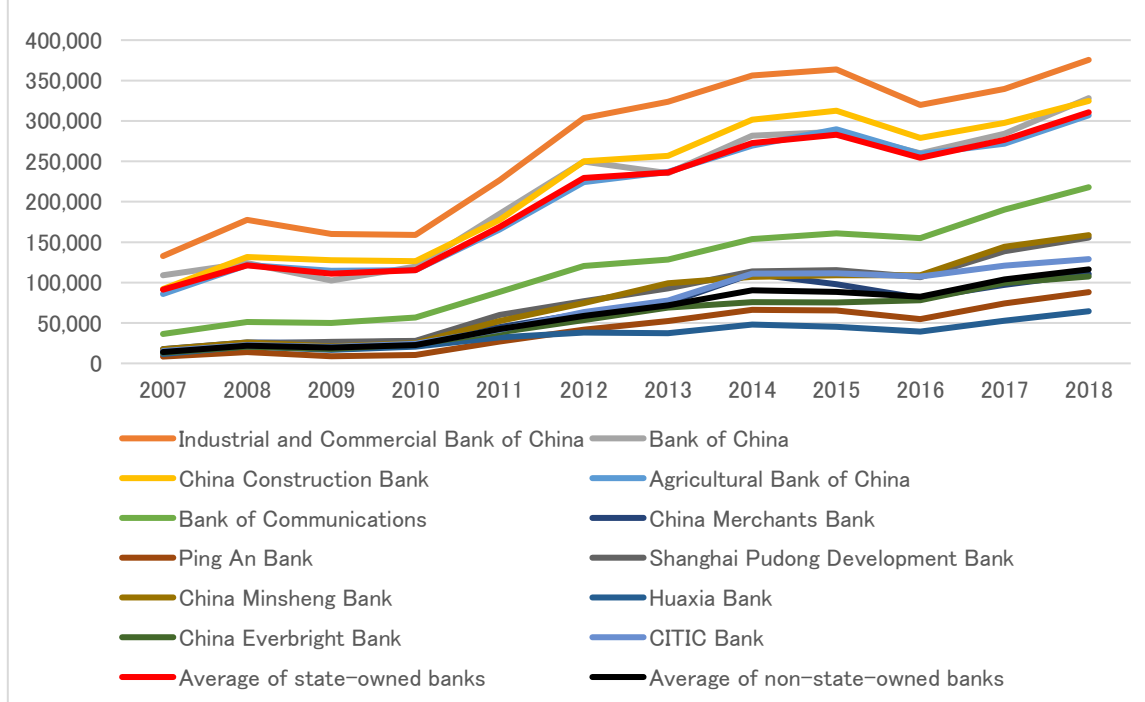


Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



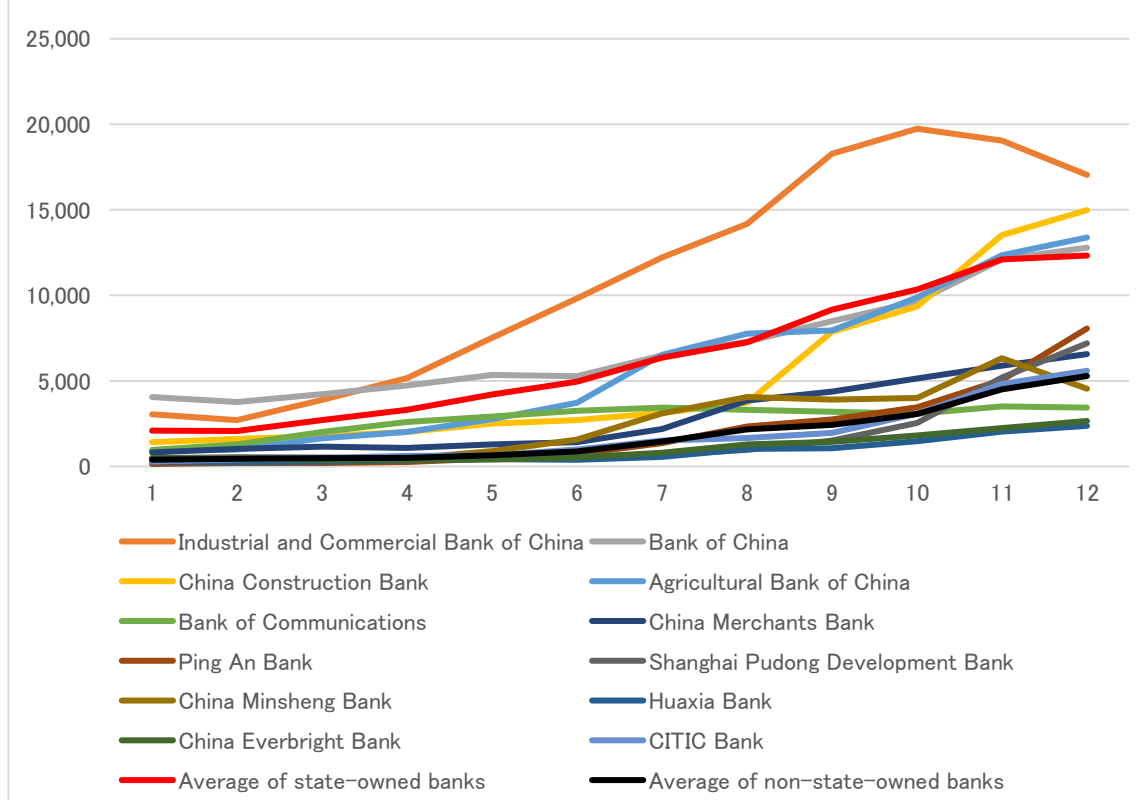
Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.

Figure 4-32 Interest Expenditure of Sample Banks 2007-2018

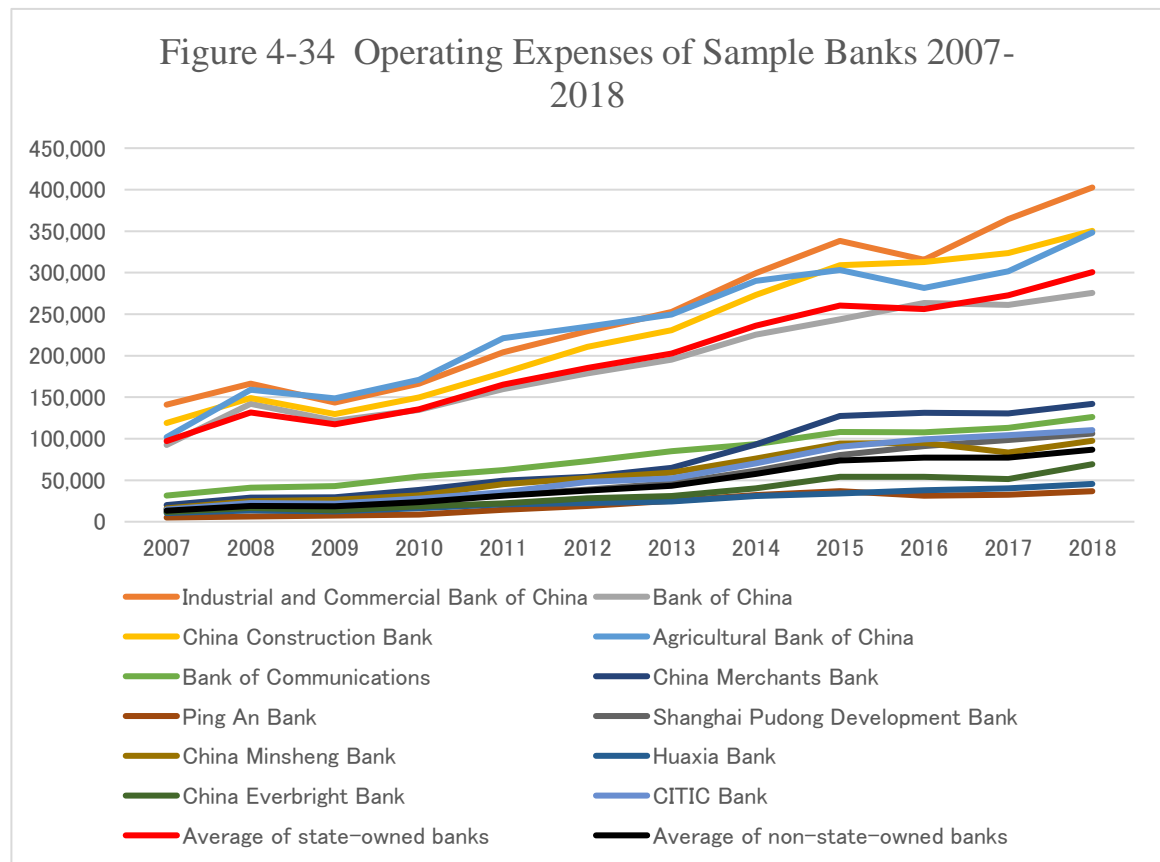


Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks

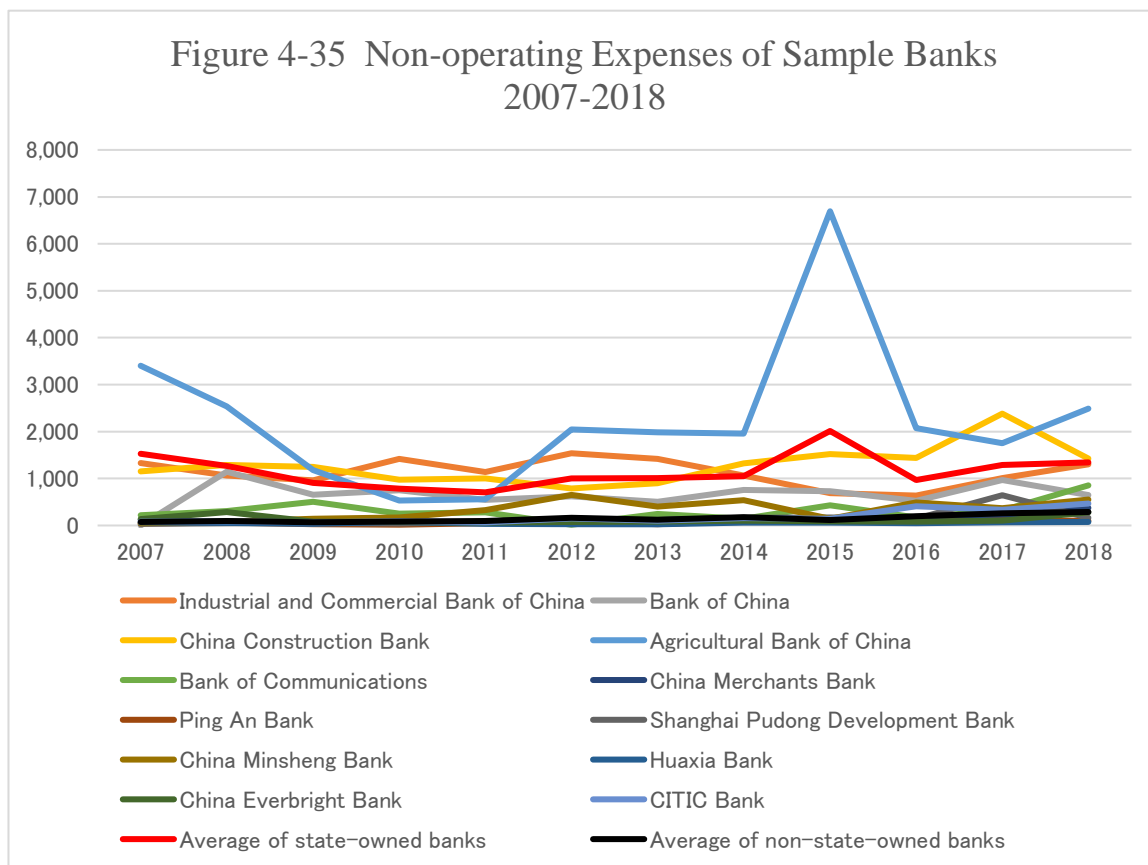
Figure 4-33 Fees and Commission Expenses of Sample Banks 2007-2018



Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks



Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.



Data sources: CSMAR database: <http://cndata.csmar.com/> and annual reports of sample banks.

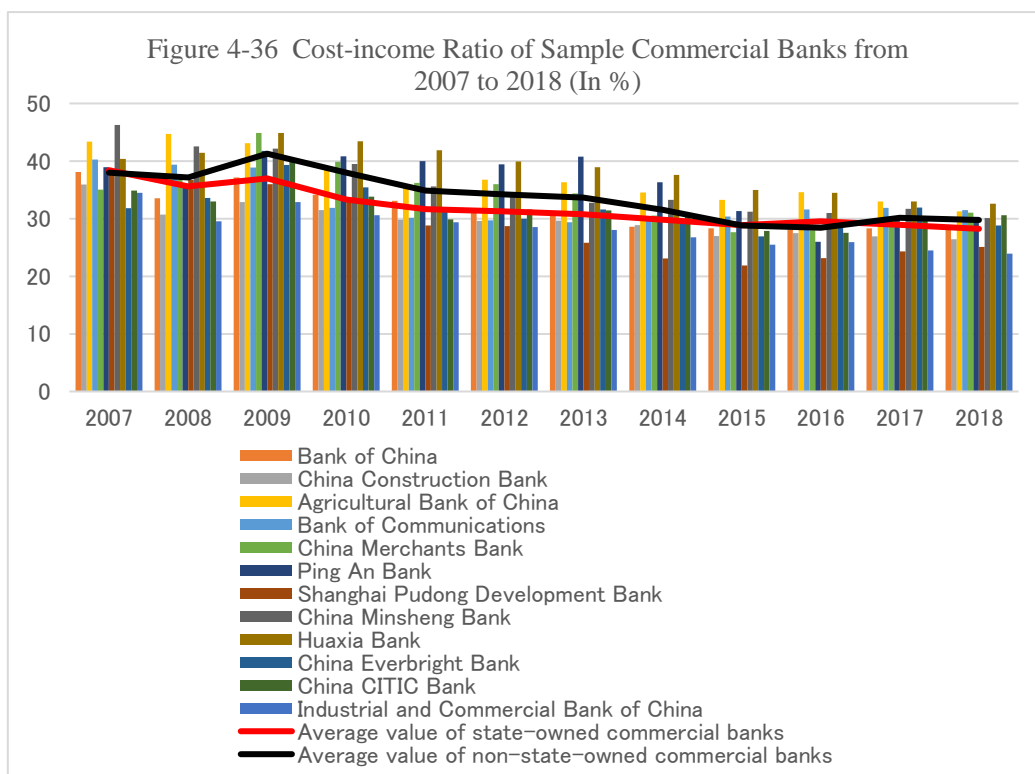
The cost-income ratio refers to the ratio of operating expenses plus depreciation to operating income. The cost-income ratio should not be higher than 45%. In the sample, the cost-income ratio of Agricultural Bank of China, Huaxia Bank and Ping An Bank all exceeded the average value, but did not exceed 45%.

Table 4-11 Cost-Income Ratio of Sample Banks from 2007 to 2018 (In %)

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Industrial and Commercial Bank of China | 34.48 | 29.54 | 32.87 | 30.61 | 29.38 | 28.56 | 28.03 | 26.75 | 25.49 | 25.91 | 24.46 | 23.91 |
| Bank of China | 38.07 | 33.55 | 37.15 | 34.16 | 33.07 | 31.81 | 30.61 | 28.57 | 28.3 | 28.08 | 28.34 | 28.09 |

| | | | | | | | | | | | | |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| China Construction Bank | 35.92 | 30.71 | 32.9 | 31.47 | 29.79 | 29.57 | 29.65 | 28.85 | 26.98 | 27.49 | 26.95 | 26.42 |
| Agricultural Bank of China | 43.36 | 44.71 | 43.11 | 38.59 | 35.89 | 36.76 | 36.3 | 34.56 | 33.28 | 34.59 | 32.96 | 31.27 |
| Bank of Communications | 40.26 | 39.38 | 38.87 | 31.89 | 30.13 | 29.71 | 29.35 | 30.29 | 30.36 | 31.6 | 31.85 | 31.5 |
| China Merchants Bank | 35.05 | 36.78 | 44.86 | 39.9 | 36.19 | 35.98 | 34.36 | 30.54 | 27.67 | 28.01 | 30.23 | 31.02 |
| Ping An Bank | 38.93 | 35.99 | 41.76 | 40.84 | 39.99 | 39.41 | 40.77 | 36.33 | 31.31 | 25.97 | 29.89 | 30.32 |
| Shanghai Pudong Development Bank | 38.62 | 36.69 | 35.99 | 33.06 | 28.79 | 28.71 | 25.83 | 23.12 | 21.86 | 23.16 | 24.34 | 25.12 |
| China Minsheng Bank | 46.26 | 42.55 | 42.17 | 39.48 | 35.61 | 34.01 | 32.75 | 33.27 | 31.22 | 30.98 | 31.72 | 30.07 |
| Huaxia Bank | 40.39 | 41.41 | 44.88 | 43.41 | 41.89 | 39.95 | 38.93 | 37.57 | 35.01 | 34.5 | 32.96 | 32.58 |
| China Everbright Bank | 31.81 | 33.61 | 39.3 | 35.44 | 31.95 | 29.97 | 31.58 | 29.82 | 26.91 | 28.77 | 31.92 | 28.79 |
| CITIC Bank | 34.89 | 32.98 | 39.95 | 33.82 | 29.86 | 31.58 | 31.41 | 30.32 | 27.85 | 27.56 | 29.92 | 30.57 |
| Average of state-owned banks | 38.42 | 35.58 | 36.98 | 33.34 | 31.65 | 31.28 | 30.79 | 29.80 | 28.88 | 29.53 | 28.91 | 28.24 |
| Average of non- state-owned banks | 37.99 | 37.14 | 41.27 | 37.99 | 34.90 | 34.23 | 33.66 | 31.57 | 28.83 | 28.42 | 30.14 | 29.78 |

Data Sources: Genius Finance: <http://www.genius.com.cn/geniusData.html> (2007-2018)



Data Sources: Genius Finance: <http://www.genius.com.cn/geniusData.html> and annual reports of sample banks.

4.2.4 Safety Capability Index Analysis

Non-performing loan ratio refers to the proportion of non-performing loans in the total loan balance of financial institutions. According to the requirements of the first paragraph of Article 9 of the *Core Indicators for Risk Supervision of Commercial Banks*,⁶⁶ the non-performing loan ratio of commercial banks in China should not be higher than 5%. From the sample data, both state-owned commercial banks and non-state-owned commercial banks are within the scope of safety level, and the relevant changes are relatively stable.

Capital adequacy ratio refers to the risk ratio weighted by the capital of

⁶⁶ Issued by Regulatory Association of China's Bank Insurance Industry on January 1, 2006

commercial banks, and is an important indicator to measure the capital security of commercial banks. The higher the capital adequacy ratio of a commercial bank, the greater its ability to bear the risk of default assets and the smaller its capital risk. From the sample data, the average level of capital adequacy ratio of state-owned commercial banks is higher than that of non-state-owned commercial banks. It can be seen that the capital risk of state-owned commercial banks is slightly smaller than that of non-state-owned commercial banks.

Provision coverage rate is the ratio of loan loss reserve to non-performing loans. It is a reserve used to offset the possible stagnant and bad debts of commercial banks. The ratio can measure whether the reserve is sufficient and can effectively deal with the risks of operation and management. According to the *Guidelines on Provision for Bank Loan Losses*,⁶⁷ the provision ratio for loss loans is at least 100%. According to the sample, the average provision coverage rate of non-state-owned commercial banks is higher than that of state-owned commercial banks, both higher than the national standard.

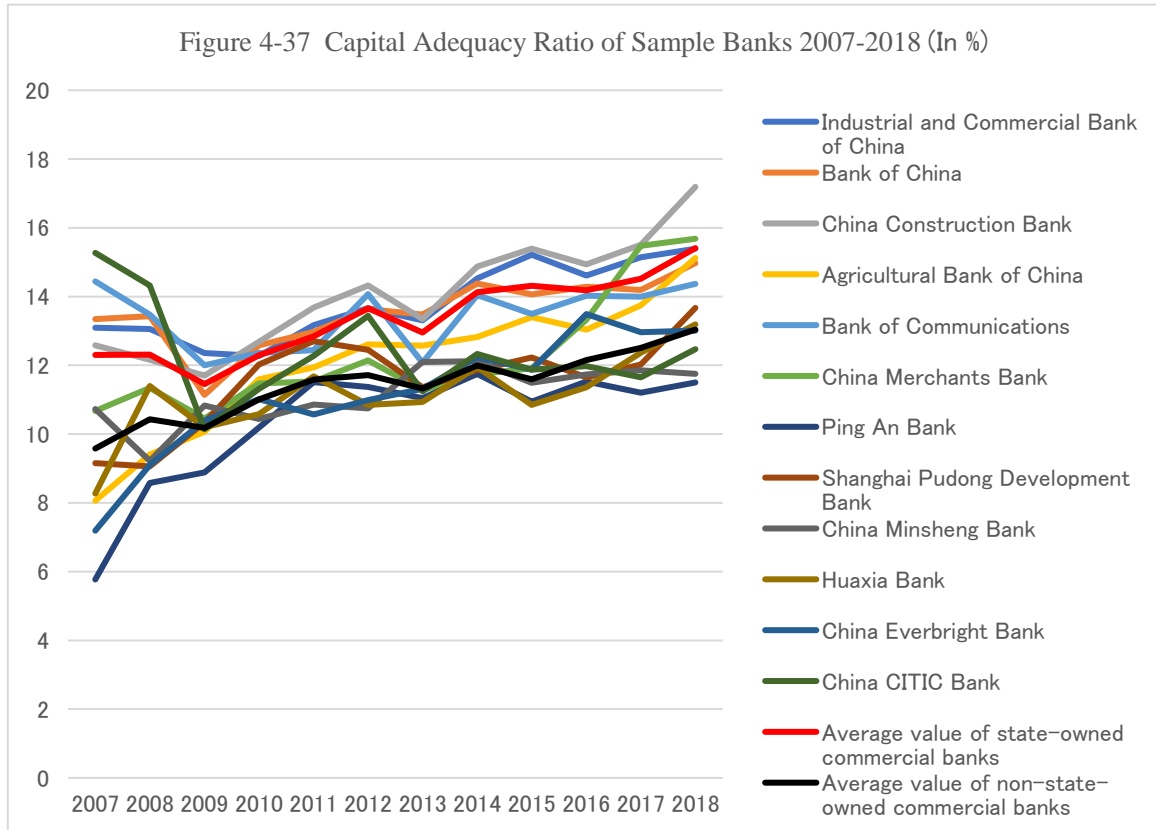
⁶⁷Issued by The People's Bank of China on April 2, 2002

Table 4-12 Capital Adequacy Ratio, Non-performing Loan Rate and Provision Coverage Rate of Sample Banks from 2007 to 2018 (In %)

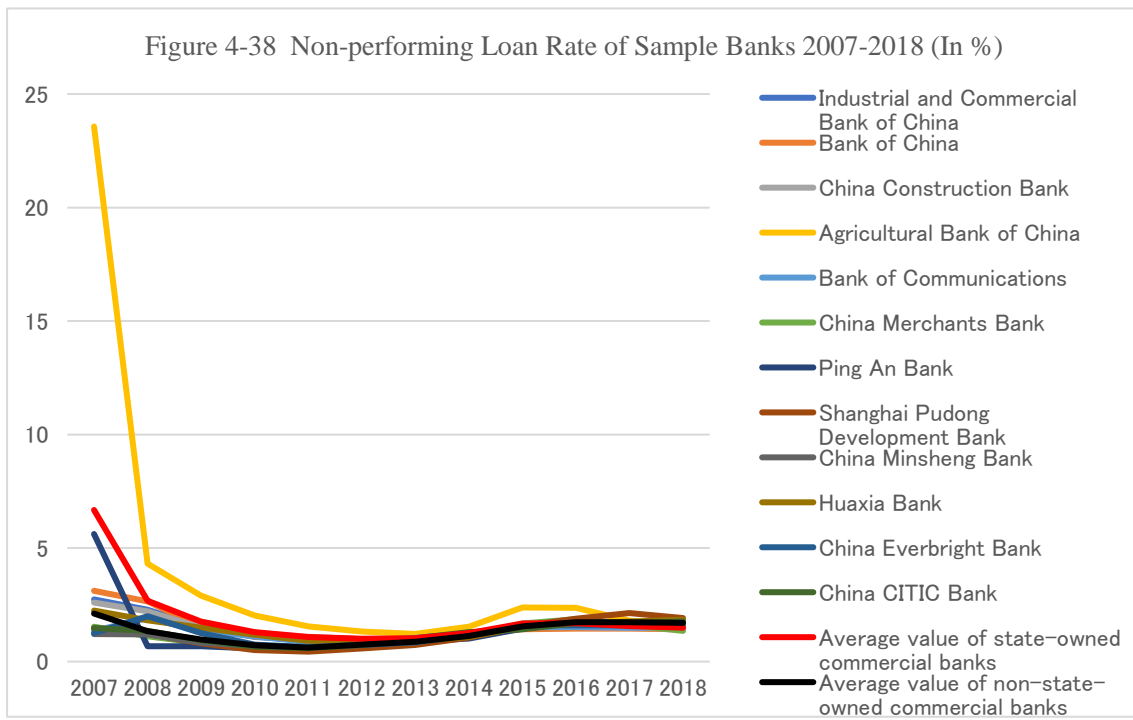
| | Bank Name | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---------------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Capital adequacy ratio | Industrial and Commercial Bank of China | 13.09 | 13.06 | 12.36 | 12.27 | 13.17 | 13.66 | 13.31 | 14.53 | 15.22 | 14.61 | 15.14 | 15.39 |
| | Bank of China | 13.34 | 13.43 | 11.14 | 12.58 | 12.97 | 13.63 | 13.47 | 14.38 | 14.06 | 14.28 | 14.19 | 14.97 |
| | China Construction Bank | 12.58 | 12.16 | 11.70 | 12.68 | 13.68 | 14.32 | 13.34 | 14.87 | 15.39 | 14.94 | 15.50 | 17.19 |
| | Agricultural Bank of China | 8.06 | 9.41 | 10.07 | 11.59 | 11.94 | 12.61 | 12.57 | 12.82 | 13.40 | 13.04 | 13.74 | 15.12 |
| | Bank of Communications | 14.44 | 13.47 | 12.00 | 12.36 | 12.44 | 14.07 | 12.08 | 14.04 | 13.49 | 14.02 | 14.00 | 14.37 |
| | China Merchants Bank | 10.67 | 11.34 | 10.45 | 11.47 | 11.53 | 12.14 | 11.28 | 11.74 | 11.91 | 13.33 | 15.48 | 15.68 |
| | Ping An Bank | 5.77 | 8.58 | 8.88 | 10.19 | 11.51 | 11.37 | 11.04 | 11.75 | 10.94 | 11.53 | 11.20 | 11.50 |
| | Shanghai Pudong Development Bank | 9.15 | 9.06 | 10.34 | 12.02 | 12.70 | 12.45 | 11.36 | 11.86 | 12.23 | 11.65 | 12.02 | 13.67 |
| | China Minsheng Bank | 10.73 | 9.22 | 10.83 | 10.44 | 10.86 | 10.75 | 12.10 | 12.12 | 11.49 | 11.73 | 11.85 | 11.75 |
| | Huaxia Bank | 8.27 | 11.40 | 10.20 | 10.58 | 11.68 | 10.85 | 10.93 | 11.95 | 10.85 | 11.36 | 12.37 | 13.19 |
| | China Everbright Bank | 7.19 | 9.10 | 10.39 | 11.02 | 10.57 | 10.99 | 11.31 | 12.24 | 11.87 | 13.49 | 12.96 | 13.01 |
| | CITIC Bank | 15.27 | 14.32 | 10.14 | 11.31 | 12.27 | 13.44 | 11.24 | 12.33 | 11.87 | 11.98 | 11.65 | 12.47 |
| | Average of state-owned banks | 12.30 | 12.31 | 11.45 | 12.30 | 12.84 | 13.66 | 12.95 | 14.13 | 14.31 | 14.18 | 14.51 | 15.41 |
| | Average of non-state-owned banks | 9.58 | 10.43 | 10.18 | 11.00 | 11.59 | 11.71 | 11.32 | 12.00 | 11.59 | 12.15 | 12.50 | 13.04 |
| Non-performing loan ratio | Industrial and Commercial Bank of China | 2.74 | 2.29 | 1.54 | 1.08 | 0.94 | 0.85 | 0.94 | 1.13 | 1.50 | 1.62 | 1.55 | 1.52 |
| | Bank of China | 3.12 | 2.65 | 1.52 | 1.10 | 1.00 | 0.95 | 0.96 | 1.18 | 1.43 | 1.46 | 1.45 | 1.42 |
| | China Construction Bank | 2.60 | 2.21 | 1.50 | 1.14 | 1.09 | 0.99 | 0.99 | 1.19 | 1.58 | 1.52 | 1.49 | 1.46 |
| | Agricultural Bank of China | 23.57 | 4.32 | 2.91 | 2.03 | 1.55 | 1.33 | 1.22 | 1.54 | 2.39 | 2.37 | 1.81 | 1.59 |
| | Bank of Communications | 1.36 | 1.92 | 1.36 | 1.12 | 0.86 | 0.92 | 1.05 | 1.25 | 1.51 | 1.52 | 1.50 | 1.49 |
| | China Merchants Bank | 1.54 | 1.11 | 0.82 | 0.68 | 0.56 | 0.61 | 0.83 | 1.11 | 1.68 | 1.87 | 1.61 | 1.36 |
| | Ping An Bank | 5.62 | 0.68 | 0.68 | 0.58 | 0.53 | 0.95 | 0.89 | 1.02 | 1.45 | 1.74 | 1.70 | 1.75 |
| | Shanghai Pudong Development Bank | 1.46 | 1.21 | 0.80 | 0.51 | 0.44 | 0.58 | 0.74 | 1.06 | 1.56 | 1.89 | 2.14 | 1.92 |
| | China Minsheng Bank | 1.22 | 1.20 | 0.84 | 0.69 | 0.63 | 0.76 | 0.85 | 1.17 | 1.60 | 1.68 | 1.71 | 1.76 |
| | Huaxia Bank | 2.25 | 1.82 | 1.50 | 1.18 | 0.92 | 0.88 | 0.90 | 1.09 | 1.52 | 1.67 | 1.76 | 1.85 |

| | | | | | | | | | | | | | |
|--------------------|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | China Everbright Bank | 1.25 | 2.00 | 1.25 | 0.75 | 0.64 | 0.74 | 0.86 | 1.19 | 1.61 | 1.60 | 1.59 | 1.59 |
| | CITIC Bank | 1.48 | 1.36 | 0.95 | 0.67 | 0.60 | 0.74 | 1.03 | 1.30 | 1.43 | 1.69 | 1.68 | 1.77 |
| | Average of state-owned banks | 6.68 | 2.68 | 1.77 | 1.29 | 1.09 | 1.01 | 1.03 | 1.26 | 1.68 | 1.70 | 1.56 | 1.50 |
| | Average of non-state-owned banks | 2.12 | 1.34 | 0.98 | 0.72 | 0.62 | 0.75 | 0.87 | 1.13 | 1.55 | 1.73 | 1.74 | 1.71 |
| provision coverage | Industrial and Commercial Bank of China | 103.50 | 130.15 | 164.41 | 228.20 | 266.92 | 295.55 | 257.19 | 206.90 | 156.34 | 136.69 | 154.07 | 175.76 |
| | Bank of China | 108.18 | 121.72 | 151.17 | 196.67 | 220.75 | 236.30 | 229.35 | 187.60 | 153.30 | 162.82 | 159.18 | 181.97 |
| | China Construction Bank | 104.41 | 131.58 | 175.77 | 221.14 | 241.44 | 271.29 | 268.22 | 222.33 | 150.99 | 150.36 | 171.08 | 208.37 |
| | Agricultural Bank of China | 93.42 | 63.53 | 105.37 | 168.05 | 263.10 | 326.14 | 367.04 | 286.53 | 189.43 | 173.40 | 208.37 | 252.18 |
| | Bank of Communications | 95.63 | 116.83 | 151.05 | 185.84 | 256.37 | 250.68 | 213.65 | 178.88 | 155.57 | 150.50 | 153.08 | 173.13 |
| | China Merchants Bank | 180.39 | 223.29 | 246.66 | 302.41 | 400.13 | 351.79 | 266.00 | 233.42 | 178.95 | 180.02 | 262.11 | 358.18 |
| | Ping An Bank | 48.28 | 105.14 | 161.84 | 271.50 | 320.66 | 182.32 | 201.06 | 200.90 | 165.86 | 155.37 | 151.08 | 155.24 |
| | Shanghai Pudong Development Bank | 191.08 | 192.49 | 245.93 | 380.56 | 499.60 | 399.85 | 319.65 | 249.09 | 211.40 | 169.13 | 132.44 | 154.88 |
| | China Minsheng Bank | 113.14 | 150.04 | 206.04 | 270.45 | 357.29 | 314.53 | 259.74 | 182.20 | 153.63 | 155.41 | 155.61 | 134.05 |
| | Huaxia Bank | 109.27 | 151.22 | 166.84 | 209.04 | 308.21 | 320.34 | 301.53 | 233.13 | 167.12 | 158.73 | 156.51 | 158.59 |
| | China Everbright Bank | 193.99 | 150.11 | 91.64 | 313.38 | 367.00 | 339.63 | 241.02 | 180.52 | 156.39 | 152.02 | 158.18 | 176.16 |
| | CITIC Bank | 110.01 | 150.03 | 149.36 | 213.51 | 272.31 | 288.25 | 206.62 | 181.26 | 167.81 | 155.50 | 169.44 | 157.98 |
| | Average of state-owned banks | 101.03 | 112.76 | 149.55 | 199.98 | 249.72 | 275.99 | 267.09 | 216.45 | 161.13 | 154.75 | 169.16 | 198.28 |
| | Average of non-state-owned banks | 135.17 | 160.33 | 181.19 | 280.12 | 360.74 | 313.82 | 256.52 | 208.65 | 171.59 | 160.88 | 169.34 | 185.01 |

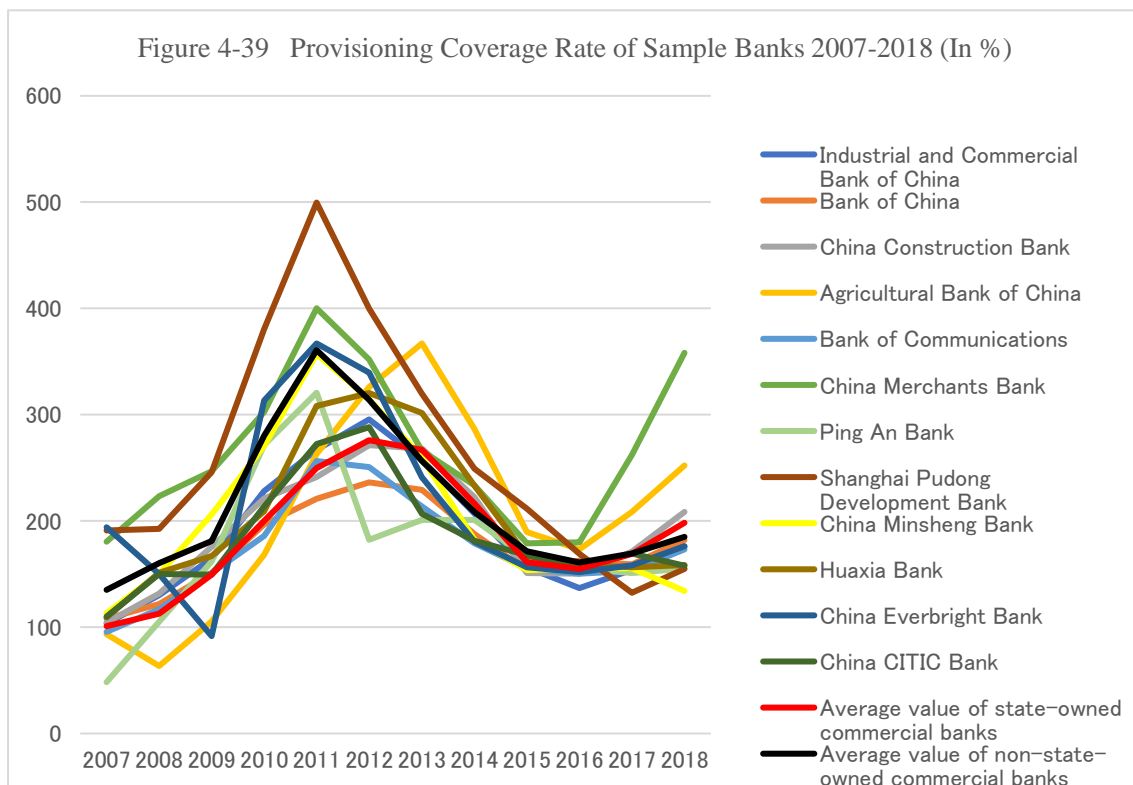
Data Sources: Genius Finance: <http://www.genius.com.cn/geniusData.html> , BankFocus: findabank.bvdinfo.com , and annual reports of sample banks .



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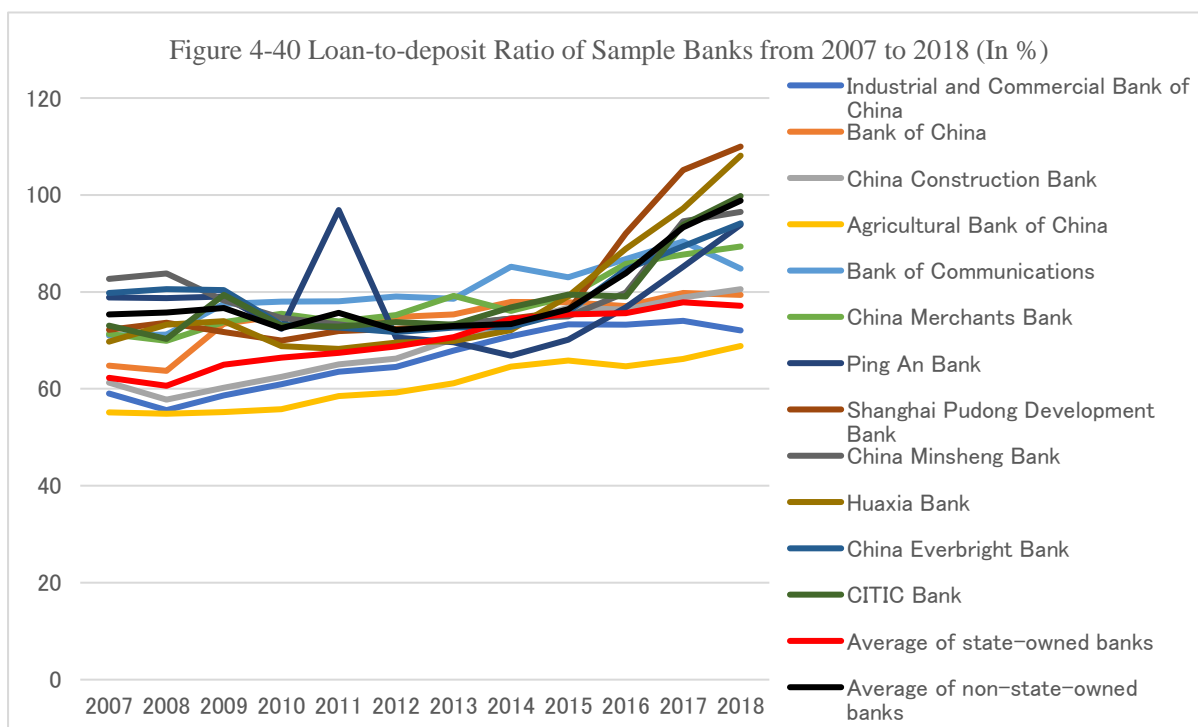
4.2.5 Analysis of Capital Flow Capacity Indicators

The loan-to-deposit ratio can be used as a measurement of bank liquidity from a side. The higher the ratio, the more loan assets corresponding to liabilities, the lower the bank liquidity. According to the sample data, the ratio of Shanghai Pudong Development Bank and Huaxia Bank among non-state-owned commercial banks exceeds 100%, while the loan-to-deposit ratio of state-owned commercial banks is lower than the loan-to-deposit ratio of non-state-owned commercial banks.

Table 4-13 Loan-to-deposit Ratio of Sample Banks from 2007 to 2018 (In %)

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|
| Industrial and Commercial Bank of China | 59.05 | 55.60 | 58.63 | 60.93 | 63.52 | 64.53 | 67.86 | 70.88 | 73.29 | 73.25 | 74.03 | 72.03 |
| Bank of China | 64.78 | 63.71 | 73.45 | 75.08 | 71.93 | 74.83 | 75.34 | 77.93 | 77.89 | 77.08 | 79.78 | 79.41 |
| China Construction Bank | 61.27 | 57.77 | 60.24 | 62.47 | 65.05 | 66.23 | 70.28 | 73.45 | 76.71 | 76.33 | 78.85 | 80.56 |
| Agricultural Bank of China | 55.17 | 54.86 | 55.19 | 55.77 | 58.50 | 59.22 | 61.17 | 64.61 | 65.81 | 64.63 | 66.20 | 68.84 |
| Bank of Communications | 70.99 | 71.21 | 77.54 | 78.00 | 78.03 | 79.05 | 78.56 | 85.16 | 82.99 | 86.77 | 90.40 | 84.80 |
| China Merchants Bank | 71.35 | 69.91 | 73.74 | 75.45 | 73.92 | 75.20 | 79.17 | 76.08 | 79.07 | 85.79 | 87.72 | 89.37 |
| Ping An Bank | 78.86 | 78.70 | 79.08 | 72.37 | 96.89 | 70.59 | 69.62 | 66.84 | 70.14 | 76.79 | 85.19 | 93.84 |
| Shanghai Pudong Development Bank | 72.17 | 73.64 | 71.71 | 69.96 | 71.93 | 72.37 | 73.05 | 74.46 | 76.01 | 92.03 | 105.16 | 109.98 |
| China Minsheng Bank | 82.68 | 83.78 | 78.28 | 74.64 | 73.28 | 71.88 | 73.33 | 74.48 | 74.96 | 79.86 | 94.54 | 96.51 |
| Huaxia Bank | 69.76 | 73.24 | 73.96 | 68.78 | 68.24 | 69.51 | 69.90 | 72.13 | 79.10 | 88.92 | 97.22 | 108.11 |
| China Everbright Bank | 79.78 | 80.55 | 80.35 | 73.25 | 72.67 | 71.70 | 72.65 | 72.78 | 75.91 | 84.65 | 89.41 | 94.14 |
| CITIC Bank | 73.07 | 70.30 | 79.41 | 73.04 | 72.87 | 73.74 | 73.21 | 76.78 | 79.45 | 79.08 | 93.82 | 99.78 |
| Average of state-owned banks | 62.25 | 60.63 | 65.01 | 66.45 | 67.41 | 68.77 | 70.64 | 74.41 | 75.34 | 75.61 | 77.85 | 77.13 |
| Average of non-state-owned banks | 75.38 | 75.73 | 76.65 | 72.50 | 75.69 | 72.14 | 72.99 | 73.36 | 76.38 | 83.87 | 93.29 | 98.82 |

Data Sources: Genius Finance: <http://www.genius.com.cn/geniusData.html> , BankFocus: findabank.bvdinfo.com , and annual reports of sample banks

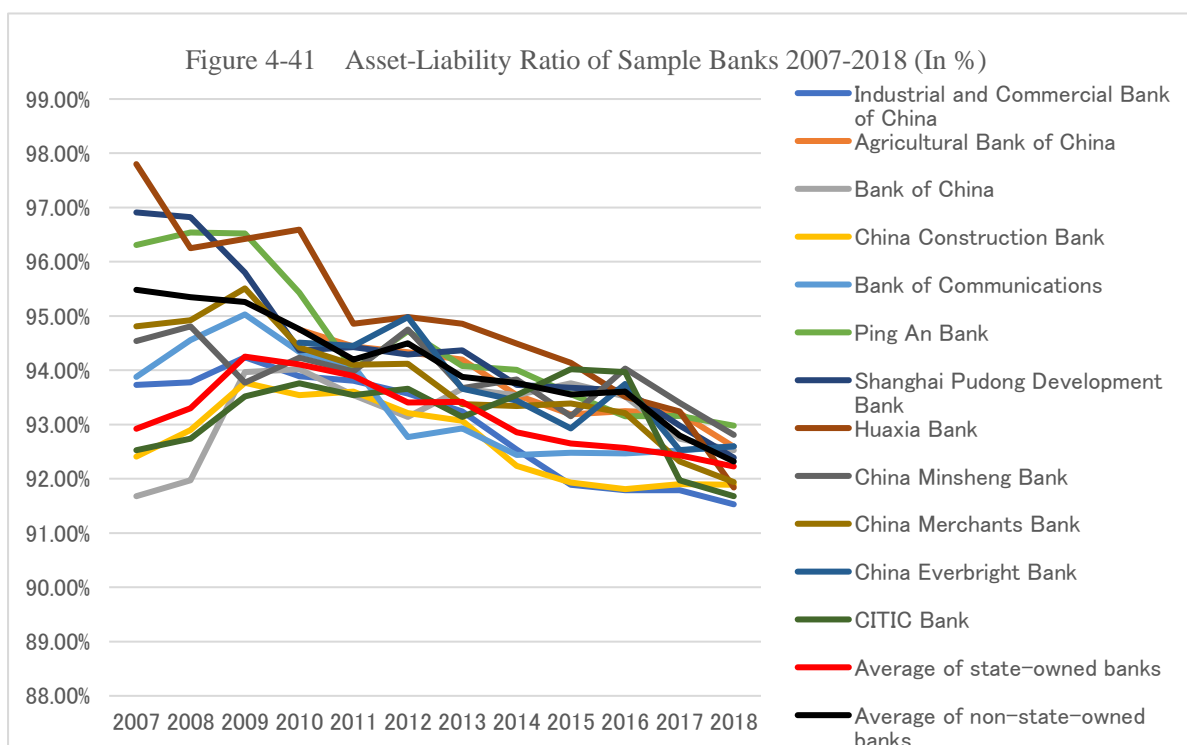


Asset-liability ratio is an index to measure the ability of commercial banks using the funds provided by creditors to carry out business activities and to reflect the degree of security of creditors in issuing loans. The higher the asset-liability ratio is within a reasonable range, the stronger the bank's ability to absorb deposits and extend loans, but the index should not exceed 100%. Judging from the changes, the changes of state-owned commercial banks and non-state-owned commercial banks have no obvious rules, but both show a decreasing trend. In 2007, the distribution of asset-liability ratio of various books was relatively scattered, but by 2018, there was a trend of convergence, stable at 91%-93%. This shows that there is no obvious difference between state-owned commercial banks and non-state-owned commercial banks in the ability of capital operation and the degree of security of creditors in issuing loans.

Table 4-14 Asset-Liability Ratio of Sample Banks from 2007 to 2018 (In %)

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Industrial and Commercial Bank of China | 93.73 | 93.78 | 94.24 | 93.89 | 93.81 | 93.57 | 93.24 | 92.54 | 91.89 | 91.79 | 91.79 | 91.53 |
| Agricultural Bank of China | | | | 94.75 | 94.44 | 94.33 | 94.20 | 93.54 | 93.19 | 93.25 | 93.21 | 92.59 |
| Bank of China | 91.68 | 91.97 | 93.97 | 94.02 | 93.54 | 93.14 | 93.66 | 93.54 | 93.76 | 93.52 | 92.74 | 92.53 |
| China Construction Bank | 92.41 | 92.90 | 93.77 | 93.54 | 93.61 | 93.21 | 93.07 | 92.24 | 91.93 | 91.81 | 91.90 | 91.89 |
| Bank of Communications | 93.88 | 94.56 | 95.03 | 94.34 | 94.08 | 92.77 | 92.93 | 92.44 | 92.48 | 92.47 | 92.52 | 92.60 |
| Ping An Bank | 96.31 | 96.54 | 96.52 | 95.43 | 94.01 | 94.72 | 94.08 | 94.01 | 93.56 | 93.15 | 93.16 | 92.98 |
| Shanghai Pudong Development Bank | 96.91 | 96.82 | 95.80 | 94.37 | 94.43 | 94.29 | 94.37 | 93.73 | 93.68 | 93.63 | 92.98 | 92.39 |
| Huaxia Bank | 97.80 | 96.25 | 96.42 | 96.59 | 94.86 | 94.98 | 94.86 | 94.49 | 94.14 | 93.51 | 93.24 | 91.84 |
| China Minsheng Bank | 94.54 | 94.81 | 93.77 | 94.23 | 93.98 | 94.75 | 93.67 | 93.83 | 93.15 | 94.03 | 93.40 | 92.81 |
| China Merchants Bank | 94.81 | 94.92 | 95.51 | 94.42 | 94.10 | 94.12 | 93.38 | 93.34 | 93.39 | 93.21 | 92.32 | 91.94 |
| China Everbright Bank | | | | 94.51 | 94.45 | 94.98 | 93.66 | 93.44 | 92.93 | 93.75 | 92.53 | 92.60 |
| CITIC Bank | 92.53 | 92.74 | 93.52 | 93.76 | 93.54 | 93.66 | 93.14 | 93.54 | 94.02 | 93.97 | 91.97 | 91.68 |
| Average of state-owned banks | 92.93 | 93.30 | 94.25 | 94.11 | 93.90 | 93.40 | 93.42 | 92.86 | 92.65 | 92.57 | 92.43 | 92.23 |
| Average of non-state-owned banks | 95.48 | 95.35 | 95.26 | 94.76 | 94.20 | 94.50 | 93.88 | 93.77 | 93.55 | 93.61 | 92.80 | 92.32 |

Data Sources: Genius Finance: <http://www.genius.com.cn/geniusData.html> , BankFocus: findabank.bvdinfo.com , and annual reports of sample banks.



Data Sources: Genius Finance: <http://www.genius.com.cn/geniusData.html> , BankFocus: findabank.bvdinfo.com , and annual reports of sample banks.

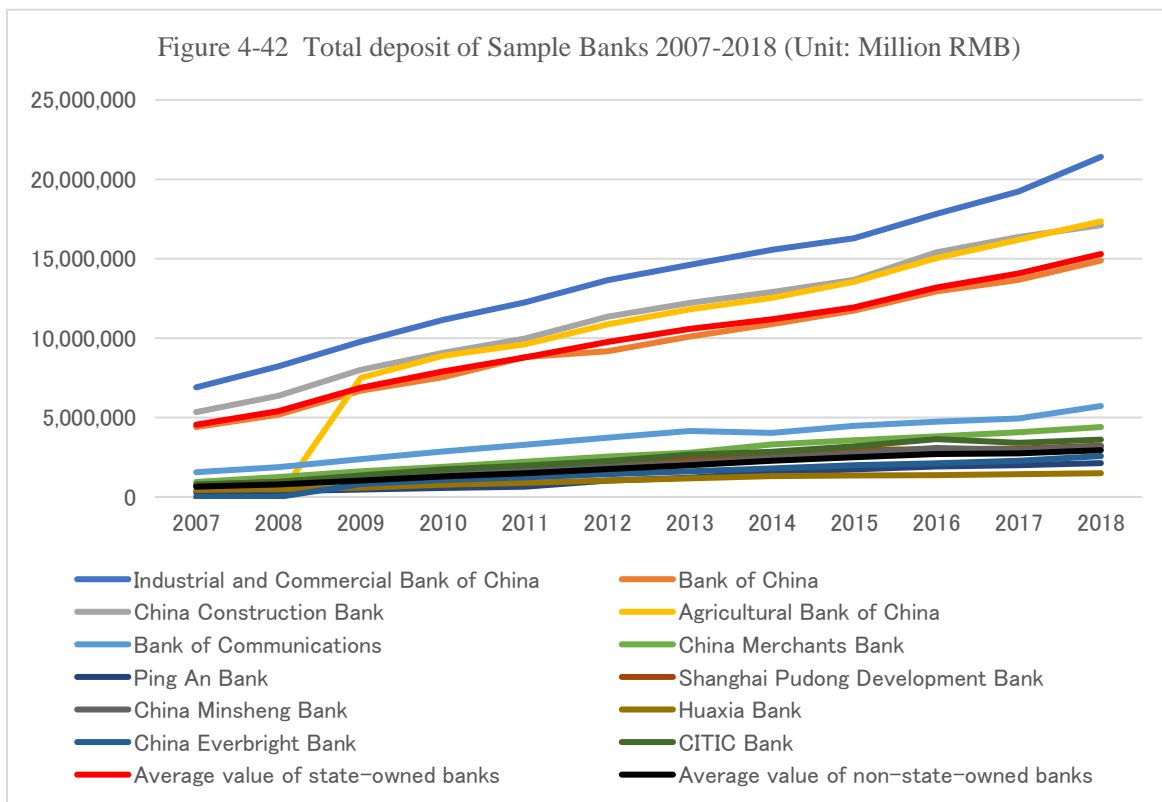
Deposits are the main source of funds for banks, and the scale of deposits restricts the scale of loans. Therefore, the deposit growth rate is also an important indicator of the sustainable development ability of the banking industry. Interest income from loans is the main source of income for commercial banks, and the scale of loans restricts the scale of profits. In this indicator, the deposit scale and loan scale of state-owned commercial banks are both better than those of non-state-owned commercial banks, further demonstrating the obvious advantages of state-owned commercial banks in scale and reputation.

Table 4-15 Total Deposits and Loans of Sample Banks 2007-2018 (Unit: Million RMB)

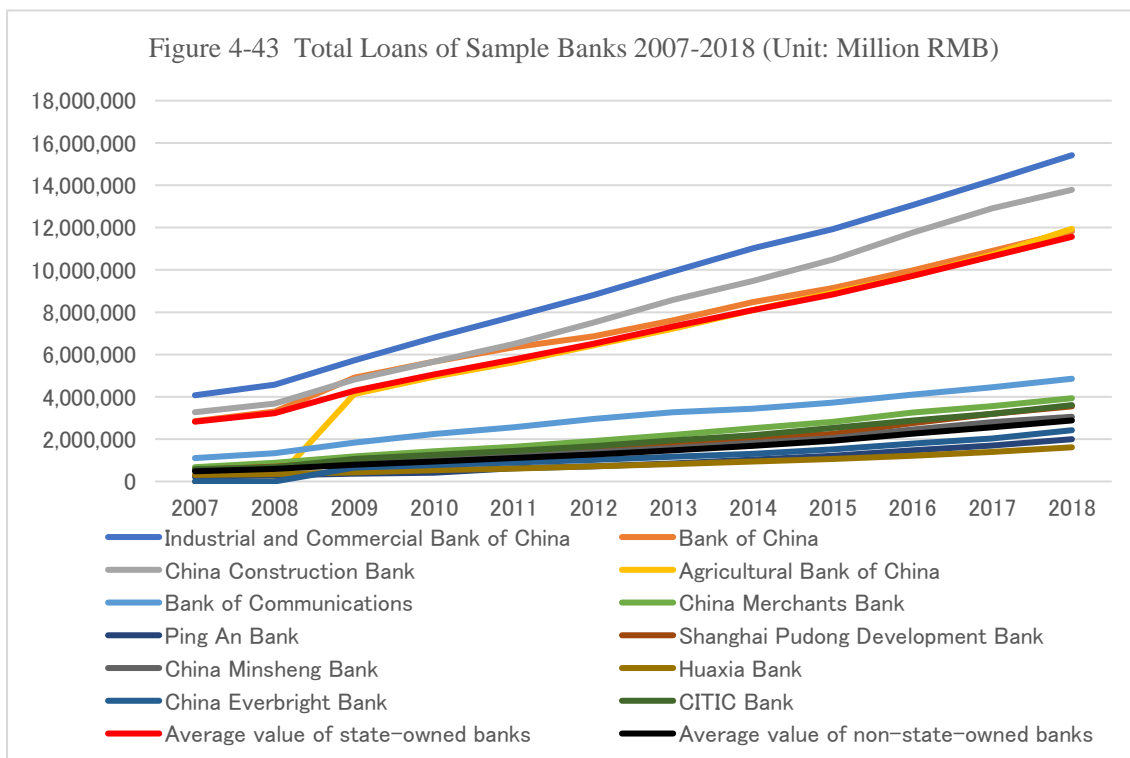
| | | 2018 | 2017 | 2016 | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 | 2009 | 2008 | 2007 |
|---|---------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|-----------|-----------|
| Industrial and Commercial Bank of China | Total deposit | 21,408,934 | 19,226,349 | 17,825,302 | 16,281,939 | 15,556,601 | 14,620,825 | 13,642,910 | 12,261,219 | 11,145,557 | 9,771,277 | 8,223,446 | 6,898,413 |
| | Total loans | 15,419,905 | 14,233,448 | 13,056,846 | 11,933,466 | 11,026,331 | 9,922,374 | 8,803,692 | 7,788,897 | 6,790,506 | 5,728,626 | 4,571,994 | 4,073,229 |
| Bank of China | Total deposit | 14,883,596 | 13,657,924 | 12,939,748 | 11,729,171 | 10,885,223 | 10,097,786 | 9,173,995 | 8,817,961 | 7,539,153 | 6,685,049 | 5,173,352 | 4,400,111 |
| | Total loans | 11,819,272 | 10,896,558 | 9,973,362 | 9,135,860 | 8,483,275 | 7,607,791 | 6,864,696 | 6,342,814 | 5,660,621 | 4,910,358 | 3,296,146 | 2,850,561 |
| China Construction Bank | Total deposit | 17,108,678 | 16,363,754 | 15,402,915 | 13,668,533 | 12,898,675 | 12,223,037 | 11,343,079 | 9,987,450 | 9,075,369 | 8,001,323 | 6,375,915 | 5,340,316 |
| | Total loans | 13,783,053 | 12,903,441 | 11,757,032 | 10,485,140 | 9,474,523 | 8,590,057 | 7,512,312 | 6,496,411 | 5,669,128 | 4,819,773 | 3,683,575 | 3,272,157 |
| Agricultural Bank of China | Total deposit | 17,346,290 | 16,194,279 | 15,038,001 | 13,538,360 | 12,533,397 | 11,811,411 | 10,862,935 | 9,622,026 | 8,887,905 | 7,497,618 | -- | -- |
| | Total loans | 11,940,685 | 10,720,611 | 9,719,639 | 8,909,918 | 8,098,067 | 7,224,713 | 6,433,399 | 5,628,705 | 4,956,741 | 4,138,187 | -- | -- |
| Bank of Communications | Total deposit | 5,724,489 | 4,930,345 | 4,728,589 | 4,484,814 | 4,029,668 | 4,157,833 | 3,728,412 | 3,283,232 | 2,867,847 | 2,372,055 | 1,865,815 | 1,555,809 |
| | Total loans | 4,854,228 | 4,456,914 | 4,102,959 | 3,722,006 | 3,431,735 | 3,266,368 | 2,947,299 | 2,561,750 | 2,236,927 | 1,839,314 | 1,328,590 | 1,104,460 |
| China Merchants Bank | Total deposit | 4,400,674 | 4,064,345 | 3,802,049 | 3,571,698 | 3,304,438 | 2,775,276 | 2,532,444 | 2,220,060 | 1,897,178 | 1,608,146 | 1,250,648 | 943,534 |
| | Total loans | 3,933,034 | 3,565,044 | 3,261,681 | 2,824,286 | 2,513,919 | 2,197,094 | 1,904,463 | 1,641,075 | 1,431,451 | 1,185,822 | 874,362 | 673,167 |
| Ping An Bank | Total deposit | 2,128,557 | 2,000,420 | 1,921,835 | 1,733,921 | 1,533,183 | 1,217,002 | 1,021,108 | 640,585 | 562,912 | 454,635 | 360,514 | 281,277 |
| | Total loans | 1,997,529 | 1,704,230 | 1,475,801 | 1,216,138 | 1,024,734 | 847,289 | 720,780 | 620,642 | 407,391 | 359,517 | 283,741 | 221,814 |
| Shanghai Pudong Development Bank | Total deposit | 3,227,018 | 3,037,936 | 3,002,015 | 2,954,149 | 2,724,004 | 2,419,696 | 2,134,365 | 1,851,055 | 1,638,680 | 1,295,342 | 947,294 | 763,473 |
| | Total loans | 3,549,205 | 3,194,600 | 2,762,806 | 2,245,518 | 2,028,380 | 1,767,494 | 1,544,553 | 1,331,436 | 1,146,489 | 928,855 | 697,565 | 550,988 |
| China Minsheng Bank | Total deposit | 3,167,292 | 2,966,311 | 3,082,242 | 2,732,262 | 2,433,810 | 2,146,689 | 1,926,194 | 1,644,738 | 1,416,939 | 1,127,938 | 785,786 | 671,219 |
| | Total loans | 3,056,746 | 2,804,307 | 2,461,586 | 2,048,048 | 1,812,666 | 1,574,263 | 1,384,610 | 1,205,221 | 1,057,571 | 882,979 | 658,360 | 554,959 |
| Huaxia Bank | Total deposit | 1,492,492 | 1,433,907 | 1,368,300 | 1,351,663 | 1,303,216 | 1,177,592 | 1,036,000 | 896,024 | 767,622 | 581,678 | 485,350 | 438,782 |
| | Total loans | 1,613,516 | 1,394,082 | 1,216,654 | 1,069,172 | 939,989 | 823,169 | 720,168 | 611,463 | 527,937 | 430,226 | 355,478 | 306,078 |
| China Everbright Bank | Total deposit | 2,571,961 | 2,272,665 | 2,120,887 | 1,993,843 | 1,785,337 | 1,605,278 | 1,426,941 | 1,225,278 | 1,063,180 | 807,703 | -- | -- |
| | Total loans | 2,421,329 | 2,032,056 | 1,795,278 | 1,513,543 | 1,299,455 | 1,166,310 | 1,023,187 | 890,365 | 778,828 | 648,969 | -- | -- |

| | | | | | | | | | | | | | |
|--|---------------|------------|------------|------------|------------|------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|
| CITIC Bank | Total deposit | 3,616,423 | 3,407,636 | 3,639,290 | 3,182,775 | 2,849,574 | 2,651,678 | 2,255,141 | 1,968,051 | 1,730,816 | 1,341,927 | 945,835 | 787,211 |
| | Total loans | 3,608,412 | 3,196,887 | 2,877,927 | 2,528,780 | 2,187,908 | 1,941,175 | 1,662,901 | 1,434,037 | 1,264,245 | 1,065,649 | 664,924 | 575,208 |
| Average value of state-owned banks | Total deposit | 15,294,397 | 14,074,530 | 13,186,911 | 11,940,563 | 11,180,713 | 10,582,178 | 9,750,266 | 8,794,378 | 7,903,166 | 6,865,464 | 5,409,632 | 4,548,662 |
| | Total loans | 11,563,429 | 10,642,194 | 9,721,968 | 8,837,278 | 8,102,786 | 7,322,261 | 6,512,280 | 5,763,715 | 5,062,785 | 4,287,252 | 3,220,076 | 2,825,102 |
| Average value of non-state-owned banks | Total deposit | 2,943,488 | 2,740,460 | 2,705,231 | 2,502,902 | 2,276,223 | 1,999,030 | 1,761,742 | 1,492,256 | 1,296,761 | 1,031,053 | 795,905 | 647,583 |
| | Total loans | 2,882,824 | 2,555,887 | 2,264,533 | 1,920,784 | 1,686,722 | 1,473,828 | 1,280,095 | 1,104,891 | 944,845 | 786,002 | 589,072 | 480,369 |

Data Sources: Genius Finance: <http://www.genius.com.cn/geniusData.html> , BankFocus: findabank.bvdinfo.com , and annual reports of sample banks.



Data Sources: Genius Finance: <http://www.genius.com.cn/geniusData.html> , BankFocus: findabank.bvdinfo.com , and annual reports of sample banks.



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5. Establishment of Performance Evaluation System and DEA Empirical Analysis

5.1 Overview of Data Envelopment Analysis

5.1.1 Basic Ideas of Data Envelopment Analysis Method

Data Envelopment Analysis (DEA) is a linear programming technique and is the most commonly used non-parametric frontier efficiency analysis method. It was originally proposed by famous strategists Charnes, Cooper and Rhodes (CCR, 1978) to evaluate the efficiency of public and non-profit sectors. ⁶⁸The basic idea of DEA is to regard an economic system or a production process as an entity (a unit) within a certain possible range, through the input of a certain number of production factors and the output of a certain number of "products" activities, such entities (units) are called Decision Making Units (DMU).

Then, a large number of DMUs form the evaluated group. Through the analysis of the input or output ratio, the weight of each input or output index of DMU is used as a variable to carry out evaluation and calculation, so as to determine the front of effective production and whether DMU is DEA efficient (i. e. with the highest relative efficiency). At the same time, the projection method can be used to point out the reasons why DMU is not DEA

⁶⁸ Subhash C. Ray. Data Envelopment Analysis with Alternative Returns to Scale[M]. Springer International Publishing:2019-12-14.

efficient or weak DEA efficient and the direction and degree to be improved.

Specifically, DEA is an improved weighted ratio method. The weight of each input or output is not given in advance by the evaluator, but the relative benefit of the evaluated unit is taken as the objective function and obtained through optimization. The restriction of the model is that the relative efficiency of the total output of all decision-making units to the total input shall not be greater than 1, all weights shall not be negative, and all decision-making units shall have uniform weights. ⁶⁹Since the evaluation of the relative benefits of each decision-making unit is based on other decision-making units with similar input and output, the selection of the weight in the calculation is to maximize the relative benefits of the evaluated unit, so the evaluation of each unit always gives it the weight of using the least input and obtaining the highest output. Through this calculation, we will finally get a group of decision-making units with the highest benefits. Compared with other units, their specific input and output items are at the frontier. This result can be helpful to get decision-making units with high benefits due to specific advantages. When a decision-making unit falls on the frontier boundary, we call the decision-making unit efficient, and its relative efficiency value is 1, which means that under other conditions, the decision-making unit cannot reduce input or increase output. If the decision-making unit falls within the boundary, the decision-making unit is inefficient, and

⁶⁹ Guo Junmei. Research on the Performance Evaluation of China's Listed Commercial Banks Based on DEA [D]. Southwestern University of Finance and Economics, 2012.

the efficiency value at this time is between 0 and 1, which indicates that the input can be reduced or the output can be increased under the condition that the input is unchanged.

5.1.2 Features and Advantages of Data Envelopment Analysis Methods

Each DMU can be regarded as the same entity, that is, each DMU has the same input and output under a certain perspective. Through the comprehensive analysis of the input and output data, DEA can obtain the quantitative index of the comprehensive efficiency of each DMU. Based on this, the DMU can be ranked in order to determine the effective DMU (i. e. the DMU with the highest relative efficiency), and point out the reasons and extent of the ineffectiveness of other DMUs, so as to provide management information to the competent department. DEA can also judge whether the input scale of each DMU is appropriate, and give the correct direction and degree for each DMU to adjust the input scale.⁷⁰

DEA, a nonparametric method, has the following advantages: 1. DEA does not need to construct a certain basic production function and estimate the parameter coefficient of the function, which can avoid inaccurate results caused by wrong setting of the function form. 2. DEA can objectively generate weights through mathematical planning and effectively deal with the problem of inconsistent input (or output) units. 3. DEA can effectively

⁷⁰ Tang Yunhe. Research on DEA Comprehensive Evaluation of Operational Efficiency of Commercial Banks [D]. University of Science and Technology of China, 2009.

deal with qualitative and quantitative input (or output) indicators, i. e. the compatibility of ratio scale and sequence scale data, and it is less limited by the amount of observed values.

5.1.3 CRS Model with Constant Return on Scale

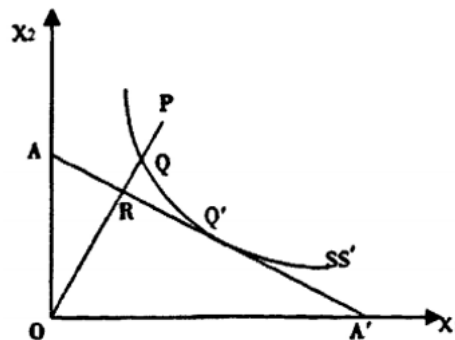


Figure 5-1 Technical efficiency and allocation efficiency with constant

1. Technical Efficiency-TE refers to the minimum input combination when producing a given output level. TE reflects an enterprise's ability to maximize its output at a given input level. Allocation Efficiency-AE refers to the maximum output capacity that an enterprise can obtain through the use of organizational resources with the input price given. The combination of the two forms the total Economic Efficiency-EE, which reflects the DMU's ability to minimize costs when producing a given output. ⁷¹

As shown in Figure 5-1, X_1 and X_2 are two inputs for the decision unit to produce product y . Assuming constant returns on scale, the equal output curve SS' represents all efficient combinations of X_1 and X_2 , and all points

⁷¹ Zhang Jianhua. DEA method for efficiency research of commercial banks in China and empirical analysis of efficiency from 1997 to 2001 [J]. Financial Research, 2003 (03): 11-25.

on the SS' curve represent technically efficient DMU. The technical efficiency of any DMU can reflect the quality of input elements and whether the combination of elements is optimized or not. In a given limited sample data, the technical efficiency of one DMU is measured according to the input and output of relatively few other DMUs. Therefore, the value of TE is a relative number.

If price information of elements X1 and X2 can be obtained, then we can obtain the equal cost curve AA'. The cut-off point Q' represents the optimal operating point. DMU at this point is not only technically effective, but also cost-effective. DMU at point Q represents effective technology. Compared with point A on the equal cost curve, it is not cost effective because it deviates from the minimum cost equilibrium. In addition, DMU at point P is neither technically efficient nor cost-efficient, because it puts in more elements than Q in the case of the same production with Q.

Farrell defines the technical efficiency at point P as OQ/OP and the configuration efficiency as OR/OQ . Obviously, the equal yield curve SS' represents the set of all technical efficiency points that produce the same yield, while the upper side is the technical inefficiency point.

Economic efficiency $EE=OR/OP= (OQ/OP) \times (OR/OQ) =TE \times AE$, thus, it is the product of technical efficiency and configuration efficiency. Economic efficiency and allocation efficiency can be measured only when input prices are available, while technical efficiency can be measured only based on

input-output data. These three efficiency values are between 0 and 1, and the value equal to 1 means efficiency, otherwise it means inefficiency.

2. CRS Model with Constant Returns on Scale

CRS model is the most basic DEA model (also called CCR model) proposed by Charnes, Cooper and Rhodes(1978). The model assumes that there are n banks, each bank is a DMU with m inputs and s outputs. ⁷²

The input data and output data of each bank are represented by x_{ij}, y_{ij}

x_{ij} = the input amount of the decision unit j (recorded as DMU_j) to the input type i , $x_{ij} > 0$;

y_{ij} = output quantity of the decision unit j (recorded as DMU_j) to the output type r , $y_{ij} > 0$;

v_i = A measure (or weight) of the input type i ;

u_r = A measure (or weight) of the output type r ;

$i=1,2,\dots,m; j=1,2,\dots,n; r=1,2,\dots,s$.

For convenience, write it down as

$$X_j = (x_{1j}, x_{2j}, \dots, x_{mj})^T, j = 1, \dots, n;$$

⁷² Lu Feng. Measurement and Research on the Efficiency of Chinese Commercial Banks [D]. Shanxi University, 2012.

$$Y_j = (y_{1j}, y_{2j}, \dots, y_{mj})^T, j = 1, \dots, n;$$

$$v = (v_1, v_2, \dots, v_m)^T;$$

$$u = (u_1, u_2, \dots, u_s)^T$$

Here, X_j and Y_j are the input and output of DMU_j respectively. They are constants, which can be obtained according to historical data or statistical data. v and u are respectively the weight vectors corresponding to m input and s output, and are variables.

For DMU_j , its efficiency evaluation index is: $h_j = \frac{u^T Y_j}{v^T X_j}, j = 1, 2, \dots, n$: we can always choose appropriate weight coefficients v and u to make $h_j \leq 1$.

Now investigate the efficiency evaluation of DMU_{j_0} : The following fractional programming problem is formed by taking the efficiency evaluation index

$$h_{j_0} = \frac{u^T Y_{j_0}}{v^T X_{j_0}} \text{ of } DMU_{j_0} \text{ as the target and the efficiency index } h_j = \frac{u^T Y_j}{v^T X_j}, j =$$

$1, 2, \dots, n$ of all decision-making units (including DMU_{j_0}) as the constraint:

$$\begin{cases} \max h_{j_0} = \frac{u^T Y_{j_0}}{v^T X_{j_0}} \\ h_j = \frac{u^T Y_j}{v^T X_j} \leq 1, j = 1, 2, \dots, n, \\ u \geq 0, v \geq 0 \end{cases} \text{(Formula 5-1)}$$

Formula 5-1 is CRS model. The fractional programming is difficult to calculate and can be divided into a linear programming form of an equation through transformation, namely:

$$\begin{cases} \max u^T Y_{j_0} \\ \omega^T X_j - \mu^T Y_{j_0} \geq 0, j = 1, 2, \dots, n \\ \omega^T X_j = 1 \\ \omega \geq 0, \mu \geq 0 \end{cases} \text{(Formula 5-2)}$$

Where, ω, μ is the optimal solution of Formula 5-2, satisfying $\omega^T X_j = 1, \omega \geq 0, \mu \geq 0$

According to the definition of Farrell(1957), assuming that θ is the technical efficiency (CRS efficiency) value of the bank under investigation (i.e. DMU_{j_0}), satisfying $0 \leq \theta \leq 1$, the dual programming of the linear programming is:

$$\begin{cases} \min \theta \\ \sum_{j=1}^n X_j \lambda_j \leq \theta X_{j_0} \\ \sum_{j=1}^n Y_j \lambda_j \geq Y_{j_0} \\ \lambda_j \geq 0, j = 1, 2, \dots, n \end{cases} \text{(Formula 5-3)}$$

Formula 5-3 is easier to solve. This is the CRS model we usually see. Here, θ is a scalar quantity. When $\theta < 1$, it indicates that the DMU is inefficient and its input of elements is wasted. therefore, the use of its input must be reduced proportionally by $1-\theta$; $\theta=1$ indicates that the DMU is efficient. If all the values θ of DMU_j are solved, the overall technical efficiency of each bank can be obtained.

5.2 Ideas for Empirical Analysis

On the basis of following the five principles of comprehensiveness, controllability, availability, relevance and accuracy, this paper compares and analyzes the current management performance evaluation concepts and

evaluation systems of commercial banks at home and abroad, and selects input and output indicators to establish a performance index system for the three aspects of commercial banks' operating capability, profitability and growth capability.

Based on the data of 11 years from 2007 to 2018, this paper takes 12 representative listed joint-stock commercial banks in China as research samples and conducts DEA analysis. The data obtained from DEA analysis are compared horizontally and vertically to analyze the causes of performance differences among banks and between years.

5.3 Establishment of Performance Indicator System

Selecting reasonable performance evaluation indexes is the basis for establishing a performance evaluation system. We can select some indexes from many indexes that can reflect the operating performance of commercial banks for research, and then we can evaluate the operating performance of commercial banks. Therefore, the establishment of index system plays an important role in the objective, accurate and scientific evaluation.

5.3.1 Principles for Selecting Performance Evaluation Indicators

The purpose of establishing the index system is to make a comprehensive evaluation of economic phenomena based on actual data. In order to ensure the science, rationality and effectiveness of the index system, we must follow the following principles when establishing an effective index system:

I. Principle of comprehensiveness

That is, the coverage of the indicators should be extensive and comprehensive, and they should be able to fully and comprehensively reflect the bank's operating performance.

The fundamental purpose of establishing a performance evaluation model is to assess the operating conditions of commercial banks, judge the viability and development potential of banks through assessment, and identify whether the overall operation of banks is healthy. Therefore, the index system should fully reflect the general principles of liquidity, safety and profitability of bank management, and through the setting of indexes and the distribution of weights, promote the optimization of business structure, improve asset quality, resolve risks and realize the maximization of bank value.⁷³

II. Principle of controllability

That is, the selected indicators can be controlled and managed by the bank through operation and management or other methods.

If the selected indicators are uncontrollable for the evaluation object, then these indicators also have no practical significance. Because no matter how banks do it, it cannot affect this index, so the index chosen is meaningless.

⁷³ Peng Jianzhou. Talking about the problems and countermeasures in the performance evaluation system of China's commercial banks [J]. China Collective Economy, 2019 (24): 111-113.

Therefore, the selected indicators must be controllable for banks.

III. Principle of availability

Also known as the principle of feasibility or operability, this refers to the availability of data, that is, operability. On the surface, this seems to be in conflict with the comprehensive principle put forward earlier, but in fact it is not. What we want here is to follow the principle of availability as much as possible on the premise of following the principle of comprehensiveness. This is because the index data in the evaluation model must be easily available. If the evaluation work is difficult to carry out or the cost is too high, the index system will lose its practicability. Therefore, the availability of data should be considered as much as possible when selecting indexes.

IV. Principle of relevance

It means to select those indicators that are closely related to the bank's performance, i. e. those that have great impact on the bank's operating performance. In this way, it is possible to exclude those indexes with weak correlation, avoid the index system being too complicated, make its operation simple and easy, and more comprehensively and systematically reflect the bank's performance with fewer indexes (fewer quantity and fewer levels).

V. Principle of accuracy

There are many indicators related to the operating performance of

commercial banks. We should focus on the selection of indicators rather than on the quantity. We should focus on the key points and not cover all aspects. Otherwise, we cannot accurately evaluate the operating conditions of the assessed objects, and we cannot effectively guide the banks to achieve the overall operating objectives. We should mainly consider whether the selected indicators are representative and can accurately reflect most of the information of commercial banks' operating performance. We should discard some non-important indicators to form the best indicator system.

5.3.2 Establishment of Index System

The function of basic indicators is to comprehensively and clearly reflect the operating performance and basic benefit level of commercial banks. It is the most basic and important indicator to evaluate the performance of commercial banks. According to the above five principles, this paper selects the evaluation index for commercial banks' operation ability, profitability and growth ability. The specific design of the index system is as follows:

I. Operational Capacity Indicators

In the process of operation, banks will gain certain income and profits by investing certain labor, assets and capital to operate. Therefore, the input and output indicators in this paper are selected as follows:

Input: Number of Employees, Net Fixed Assets, Paid-in Capital

Output: operating income, net profit

II. Profitability indicators

As an economic entity, the bank's ultimate goal must be to obtain profits. Therefore, it needs to input certain economic costs to obtain profits. The input and output indicators selected in this paper are:

Input: interest expense, operating expenses, net asset Output: interest income, investment income, net profit

What needs to be explained here is that although the bank's investment includes many other aspects from the perspective of capital, due to the availability of data, only the three most important indicators are selected as input indicators in this paper.

III. Indicators of growth capacity

The performance growth capability index of commercial banks examines a dynamic efficiency of commercial banks. We regard the bank as a continuous operating entity and distinguish the performance by year. We have reason to believe that the performance of the bank in the current year is closely related to the basis of the performance of the previous year. In other words, the current income of the bank is based on the use of the funds of the previous year. Therefore, we determine the following input and output: Input: total assets of the previous year, owner's equity of the previous year and net profit of the previous year. Output: Increase in assets this year, increase in owner's equity this year and increase in net profit this year

5.4 DEA Empirical Analysis in Performance Evaluation of Chinese Commercial Banks

5.4.1 Selection of Samples

According to the needs of analysis and the availability of data, this paper selects the data of nearly 11 years from 2007 to 2018 and takes 12 representative listed joint-stock commercial banks in China as research samples. They are: Industrial and Commercial Bank of China, Bank of China, China Construction Bank, Agricultural Bank of China, Bank of Communications, CITIC Bank, Huaxia Bank, China Minsheng Bank, Ping An Bank, China Merchants Bank, China Everbright Bank and Shanghai Pudong Development Bank. Among them, Five banks in front are state-controlled large commercial banks, while the other seven are national small and medium-sized joint-stock commercial banks. Most of the data in this article come from the 2007-2018 *Almanac of China's Finance and Banking* and the annual reports of commercial banks published on the website of the China Banking Association. Individual data are obtained through calculation.

Among them, in order to obtain accurate and detailed operating data, the data of commercial banks listed in A shares and H shares from 2007 to 2018 are initially selected, and then data of commercial banks with abnormal operating results and short listing time are excluded (short listing time: Postal Savings Bank of China, abnormal operating results disclosure: China Bohai Bank, HENGFENG BANK)

5.4.2 Data Processing

In this paper, the input-oriented DEA model is used to calculate with DEAP version 2.1. The results are as follows:

Table 5-1 Data Calculation Results of 2007

| | Operating capacity | | | | Profitability index | | | |
|---|----------------------|---------------------------|------------------|-----------------|----------------------|---------------------------|------------------|-----------------|
| | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale |
| Industrial and Commercial Bank of China | 0.567 | 1 | 0.567 | Decrease | 0.615 | 1 | 0.615 | Decrease |
| Bank of China | 0.496 | 1 | 0.496 | Decrease | 0.562 | 0.908 | 0.619 | Decrease |
| China Construction Bank | 0.654 | 1 | 0.654 | Decrease | 0.676 | 1 | 0.676 | Decrease |
| Agricultural Bank of China | 0.337 | 1 | 0.337 | Decrease | 0.598 | 0.942 | 0.635 | Decrease |
| Bank of Communications | 0.6 | 0.898 | 0.669 | Decrease | 1 | 1 | 1 | Unchanged |
| China Merchants Bank | 1 | 1 | 1 | Unchanged | 1 | 1 | 1 | Unchanged |
| Ping An Bank | 1 | 1 | 1 | Unchanged | 1 | 1 | 1 | Unchanged |
| Pudong Development Bank | 1 | 1 | 1 | Unchanged | 0.98 | 0.983 | 0.997 | Decrease |
| China Minsheng Bank | 0.857 | 0.857 | 1 | Unchanged | 0.841 | 0.869 | 0.967 | Decrease |
| Huaxia Bank | 0.836 | 1 | 0.836 | Increase | 0.558 | 0.747 | 0.747 | Increase |
| China Everbright Bank | 0.924 | 0.943 | 0.979 | Decrease | 0.73 | 0.783 | 0.932 | Increase |
| CITIC Bank | 1 | 1 | 1 | Unchanged | 0.778 | 0.833 | 0.933 | Increase |

Table 5-2 Data Calculation Results of 2018

| | Operating capacity | | | | Profitability index | | | | Growth capacity index | | | |
|---|----------------------|---------------------------|------------------|-----------------|----------------------|---------------------------|------------------|-----------------|-----------------------|---------------------------|------------------|-----------------|
| | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale |
| Industrial and Commercial Bank of China | 0.701 | 1 | 0.701 | Decrease | 0.922 | 1 | 0.922 | Decrease | 0.441 | 1 | 0.441 | Decrease |
| Bank of China | 0.469 | 1 | 0.469 | Decrease | 0.702 | 0.755 | 0.929 | Decrease | 0.373 | 0.468 | 0.797 | Decrease |
| China Construction Bank | 0.744 | 1 | 0.744 | Decrease | 0.92 | 1 | 0.92 | Decrease | 0.465 | 1 | 0.465 | Decrease |
| Agricultural Bank of China | 0.319 | 0.675 | 0.472 | Decrease | 0.55 | 0.587 | 0.938 | Decrease | 1 | 1 | 1 | Unchanged |
| Bank of Communications | 0.627 | 0.831 | 0.755 | Decrease | 0.963 | 0.989 | 0.973 | Decrease | 0.634 | 0.807 | 0.785 | Decrease |
| China Merchants Bank | 0.897 | 1 | 0.897 | Decrease | 1 | 1 | 1 | Unchanged | 0.57 | 0.619 | 0.922 | Increase |
| Ping An Bank | 1 | 1 | 1 | Unchanged | 0.133 | 1 | 0.133 | Increase | 0.802 | 1 | 0.802 | Increase |
| Pudong Development Bank | 1 | 1 | 1 | Unchanged | 0.898 | 1 | 0.898 | Increase | 1 | 1 | 1 | Unchanged |
| China Minsheng Bank | 0.94 | 0.981 | 0.958 | Decrease | 0.562 | 0.823 | 0.683 | Increase | 0.339 | 0.519 | 0.654 | Increase |
| Huaxia Bank | 0.812 | 1 | 0.812 | Increase | 0.315 | 0.83 | 0.38 | Increase | 1 | 1 | 1 | Unchanged |
| China Everbright Bank | 0.745 | 0.828 | 0.899 | Increase | 0.645 | 0.982 | 0.657 | Increase | 0.426 | 0.735 | 0.58 | Increase |
| CITIC Bank | 0.961 | 1 | 0.961 | Decrease | 0.841 | 0.977 | 0.862 | Increase | 0.655 | 0.75 | 0.874 | Increase |

Table 5-3 Data Calculation Results of 2009

| | Operating capacity index | | | | Profitability index | | | | Growth capacity index | | | |
|---|--------------------------|---------------------------|------------------|-----------------|----------------------|---------------------------|------------------|-----------------|-----------------------|---------------------------|------------------|-----------------|
| | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale |
| Industrial and Commercial Bank of China | 0.656 | 1 | 0.656 | Decrease | 1 | 1 | 1 | Unchanged | 0.517 | 1 | 0.517 | Decrease |
| Bank of China | 0.538 | 0.985 | 0.546 | Decrease | 0.994 | 1 | 0.994 | Increase | 0.666 | 1 | 0.666 | Decrease |
| China Construction Bank | 0.664 | 1 | 0.664 | Decrease | 1 | 1 | 1 | Unchanged | 0.665 | 1 | 0.665 | Decrease |
| Agricultural Bank of China | 0.326 | 0.727 | 0.448 | Decrease | 0.678 | 0.689 | 0.984 | Increase | 0.717 | 1 | 0.717 | Decrease |
| Bank of Communications | 0.656 | 0.989 | 0.663 | Decrease | 0.826 | 0.857 | 0.965 | Increase | 0.548 | 0.637 | 0.861 | Decrease |
| China Merchants Bank | 0.77 | 1 | 0.77 | Decrease | 0.855 | 0.957 | 0.893 | Increase | 0.732 | 0.812 | 0.902 | Decrease |
| Ping An Bank | 1 | 1 | 1 | Unchanged | 0.777 | 1 | 0.777 | Increase | 1 | 1 | 1 | Unchanged |
| Pudong Development Bank | 1 | 1 | 1 | Unchanged | 0.746 | 0.832 | 0.897 | Increase | 1 | 1 | 1 | Unchanged |
| China Minsheng Bank | 1 | 1 | 1 | Unchanged | 0.765 | 0.852 | 0.897 | Increase | 1 | 1 | 1 | Unchanged |
| Huaxia Bank | 0.827 | 0.999 | 0.828 | Increase | 0.401 | 0.695 | 0.576 | Increase | 0.508 | 0.649 | 0.782 | Increase |
| China Everbright Bank | 0.748 | 0.82 | 0.912 | Increase | 0.617 | 0.745 | 0.828 | Increase | 1 | 1 | 1 | Unchanged |
| CITIC Bank | 1 | 1 | 1 | Unchanged | 0.863 | 0.998 | 0.865 | Increase | 1 | 1 | 1 | Unchanged |

Table 5-4 Data Calculation Results of 2010

| | Operating capacity index | | | | Profitability index | | | | Growth capacity index | | | |
|---|--------------------------|---------------------------|------------------|-----------------|----------------------|---------------------------|------------------|-----------------|-----------------------|---------------------------|------------------|-----------------|
| | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale |
| Industrial and Commercial Bank of China | 0.71 | 1 | 0.71 | Decrease | 1 | 1 | 1 | Unchanged | 0.724 | 1 | 0.724 | Decrease |
| Bank of China | 0.575 | 0.942 | 0.61 | Decrease | 0.867 | 0.875 | 0.99 | Increase | 0.687 | 1 | 0.687 | Decrease |
| China Construction Bank | 0.63 | 1 | 0.63 | Decrease | 1 | 1 | 1 | Unchanged | 0.681 | 0.867 | 0.786 | Decrease |
| Agricultural Bank of China | 0.368 | 0.676 | 0.544 | Decrease | 0.768 | 0.779 | 0.986 | Increase | 0.827 | 1 | 0.827 | Decrease |
| Bank of Communications | 0.688 | 0.896 | 0.768 | Decrease | 0.794 | 0.836 | 0.95 | Increase | 0.673 | 0.757 | 0.89 | Decrease |
| China Merchants Bank | 0.974 | 1 | 0.974 | Decrease | 0.878 | 1 | 0.878 | Increase | 0.847 | 0.928 | 0.913 | Decrease |
| Ping An Bank | 1 | 1 | 1 | Unchanged | 0.725 | 1 | 0.725 | Increase | 0.818 | 1 | 0.818 | Increase |
| Pudong Development Bank | 1 | 1 | 1 | Unchanged | 0.775 | 0.864 | 0.897 | Increase | 1 | 1 | 1 | Unchanged |
| China Minsheng Bank | 1 | 1 | 1 | Unchanged | 0.776 | 0.889 | 0.874 | Increase | 0.971 | 0.978 | 0.993 | Decrease |
| Huaxia Bank | 1 | 1 | 1 | Unchanged | 0.461 | 0.699 | 0.659 | Increase | 1 | 1 | 1 | Unchanged |
| China Everbright Bank | 0.899 | 0.93 | 0.966 | Increase | 0.698 | 0.836 | 0.835 | Increase | 1 | 1 | 1 | Unchanged |
| CITIC Bank | 0.95 | 1 | 0.95 | Decrease | 0.843 | 0.997 | 0.846 | Increase | 0.946 | 1 | 0.946 | Decrease |

Table 5-5 Data Calculation Results of 2011

| | Operating capacity index | | | | Profitability index | | | | Growth capacity index | | | |
|---|--------------------------|---------------------------|------------------|-----------------|----------------------|---------------------------|------------------|-----------------|-----------------------|---------------------------|------------------|-----------------|
| | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale |
| Industrial and Commercial Bank of China | 0.619 | 1 | 0.619 | Decrease | 1 | 1 | 1 | Unchanged | 0.537 | 1 | 0.537 | Decrease |
| Bank of China | 0.52 | 0.912 | 0.571 | Decrease | 0.814 | 0.825 | 0.986 | Increase | 0.339 | 0.875 | 0.388 | Decrease |
| China Construction Bank | 0.587 | 1 | 0.587 | Decrease | 1 | 1 | 1 | Unchanged | 0.542 | 0.99 | 0.547 | Decrease |
| Agricultural Bank of China | 0.388 | 0.725 | 0.536 | Decrease | 0.772 | 0.787 | 0.981 | Increase | 0.453 | 1 | 0.453 | Decrease |
| Bank of Communications | 0.66 | 0.863 | 0.765 | Decrease | 0.815 | 0.88 | 0.926 | Increase | 0.504 | 0.728 | 0.693 | Decrease |
| China Merchants Bank | 0.983 | 1 | 0.983 | Decrease | 0.937 | 1 | 0.937 | Increase | 0.736 | 0.771 | 0.955 | Decrease |
| Ping An Bank | 1 | 1 | 1 | Unchanged | 0.709 | 1 | 0.709 | Increase | 1 | 1 | 1 | Unchanged |
| Pudong Development Bank | 1 | 1 | 1 | Unchanged | 0.833 | 0.952 | 0.875 | Increase | 0.658 | 0.75 | 0.877 | Decrease |
| China Minsheng Bank | 1 | 1 | 1 | Unchanged | 0.925 | 1 | 0.925 | Increase | 1 | 1 | 1 | Unchanged |
| Huaxia Bank | 0.846 | 0.889 | 0.952 | Decrease | 0.537 | 1 | 0.537 | Increase | 0.825 | 1 | 0.825 | Increase |
| China Everbright Bank | 0.749 | 0.767 | 0.977 | Increase | 0.808 | 1 | 0.808 | Increase | 0.633 | 0.65 | 0.974 | Decrease |
| CITIC Bank | 0.951 | 1 | 0.951 | Decrease | 0.851 | 1 | 0.851 | Increase | 0.753 | 1 | 0.753 | Decrease |

Table 5-6 Data Calculation Results of 2012

| | Operating capacity index | | | | Profitability index | | | | Growth capacity index | | | |
|---|--------------------------|---------------------------|------------------|-----------------|----------------------|---------------------------|------------------|-----------------|-----------------------|---------------------------|------------------|-----------------|
| | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale |
| Industrial and Commercial Bank of China | 0.583 | 1 | 0.583 | Decrease | 1 | 1 | 1 | Unchanged | 0.589 | 1 | 0.589 | Decrease |
| Bank of China | 0.523 | 0.893 | 0.586 | Decrease | 0.836 | 0.841 | 0.993 | Increase | 0.475 | 0.667 | 0.712 | Decrease |
| China Construction Bank | 0.579 | 1 | 0.579 | Decrease | 1 | 1 | 1 | Unchanged | 0.584 | 0.949 | 0.615 | Decrease |
| Agricultural Bank of China | 0.395 | 0.71 | 0.556 | Decrease | 0.823 | 0.832 | 0.989 | Increase | 0.6 | 1 | 0.6 | Decrease |
| Bank of Communications | 0.66 | 0.902 | 0.732 | Decrease | 0.809 | 0.869 | 0.932 | Increase | 1 | 1 | 1 | Unchanged |
| China Merchants Bank | 1 | 1 | 1 | Unchanged | 0.959 | 1 | 0.959 | Increase | 0.798 | 0.809 | 0.986 | Increase |
| Ping An Bank | 1 | 1 | 1 | Unchanged | 0.681 | 1 | 0.681 | Increase | 0.97 | 1 | 0.97 | Increase |
| Pudong Development Bank | 1 | 1 | 1 | Unchanged | 0.856 | 0.997 | 0.859 | Increase | 0.796 | 0.8 | 0.995 | Decrease |
| China Minsheng Bank | 0.904 | 1 | 0.904 | Decrease | 0.861 | 0.933 | 0.923 | Increase | 1 | 1 | 1 | Unchanged |
| Huaxia Bank | 0.946 | 1 | 0.946 | Increase | 0.62 | 1 | 0.62 | Increase | 1 | 1 | 1 | Unchanged |
| China Everbright Bank | 0.809 | 0.921 | 0.878 | Increase | 0.799 | 1 | 0.799 | Increase | 0.879 | 0.963 | 0.913 | Increase |
| CITIC Bank | 0.933 | 0.97 | 0.962 | Decrease | 0.765 | 0.874 | 0.875 | Increase | 0.392 | 0.618 | 0.635 | Increase |

Table 5-7 Data Calculation Results of 2013

| | Operating capacity index | | | | Profitability index | | | | Growth capacity index | | | |
|---|--------------------------|---------------------------|------------------|-----------------|----------------------|---------------------------|------------------|-----------------|-----------------------|---------------------------|------------------|-----------------|
| | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale |
| Industrial and Commercial Bank of China | 0.563 | 1 | 0.563 | Decrease | 1 | 1 | 1 | Unchanged | 0.592 | 1 | 0.592 | Decrease |
| Bank of China | 0.52 | 0.939 | 0.554 | Decrease | 0.846 | 0.867 | 0.976 | Increase | 0.596 | 0.986 | 0.605 | Decrease |
| China Construction Bank | 0.552 | 1 | 0.552 | Decrease | 1 | 1 | 1 | Unchanged | 0.644 | 1 | 0.644 | Decrease |
| Agricultural Bank of China | 0.376 | 0.747 | 0.504 | Decrease | 0.836 | 0.852 | 0.981 | Increase | 0.714 | 1 | 0.714 | Decrease |
| Bank of Communications | 0.641 | 0.91 | 0.705 | Decrease | 0.751 | 0.81 | 0.927 | Increase | 0.612 | 0.675 | 0.906 | Decrease |
| China Merchants Bank | 0.977 | 1 | 0.977 | Decrease | 0.92 | 1 | 0.92 | Increase | 1 | 1 | 1 | Unchanged |
| Ping An Bank | 1 | 1 | 1 | Unchanged | 0.579 | 0.969 | 0.598 | Increase | 1 | 1 | 1 | Unchanged |
| Pudong Development Bank | 1 | 1 | 1 | Unchanged | 0.851 | 0.959 | 0.888 | Increase | 0.96 | 0.968 | 0.992 | Increase |
| China Minsheng Bank | 0.822 | 0.946 | 0.869 | Decrease | 0.958 | 1 | 0.958 | Increase | 0.831 | 0.848 | 0.98 | Increase |
| Huaxia Bank | 0.937 | 1 | 0.937 | Increase | 0.663 | 1 | 0.663 | Increase | 0.916 | 1 | 0.916 | Increase |
| China Everbright Bank | 0.701 | 0.861 | 0.815 | Increase | 0.828 | 1 | 0.828 | Increase | 1 | 1 | 1 | Unchanged |
| CITIC Bank | 0.87 | 0.911 | 0.956 | Decrease | 0.781 | 0.906 | 0.862 | Increase | 1 | 1 | 1 | Unchanged |

Table 5-8 Data Calculation Results of 2014

| | Operating capacity index | | | | Profitability index | | | | Growth capacity index | | | |
|---|--------------------------|---------------------------|------------------|-----------------|----------------------|---------------------------|------------------|-----------------|-----------------------|---------------------------|------------------|-----------------|
| | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale |
| Industrial and Commercial Bank of China | 0.551 | 1 | 0.551 | Decrease | 1 | 1 | 1 | Unchanged | 0.861 | 1 | 0.861 | Decrease |
| Bank of China | 0.53 | 0.936 | 0.566 | Decrease | 0.865 | 0.878 | 0.985 | Increase | 1 | 1 | 1 | Unchanged |
| China Construction Bank | 0.565 | 1 | 0.565 | Decrease | 1 | 1 | 1 | Unchanged | 0.743 | 0.905 | 0.821 | Decrease |
| Agricultural Bank of China | 0.374 | 0.839 | 0.446 | Decrease | 0.859 | 0.894 | 0.961 | Increase | 0.842 | 1 | 0.842 | Decrease |
| Bank of Communications | 0.671 | 0.891 | 0.753 | Decrease | 0.783 | 0.857 | 0.914 | Increase | 0.613 | 0.616 | 0.996 | Increase |
| China Merchants Bank | 0.996 | 1 | 0.996 | Decrease | 0.869 | 0.961 | 0.905 | Increase | 0.89 | 0.979 | 0.909 | Decrease |
| Ping An Bank | 1 | 1 | 1 | Unchanged | 0.674 | 1 | 0.674 | Increase | 1 | 1 | 1 | Unchanged |
| Pudong Development Bank | 1 | 1 | 1 | Unchanged | 0.841 | 0.969 | 0.868 | Increase | 1 | 1 | 1 | Unchanged |
| China Minsheng Bank | 0.805 | 0.883 | 0.911 | Decrease | 0.833 | 0.947 | 0.879 | Increase | 1 | 1 | 1 | Unchanged |
| Huaxia Bank | 0.933 | 1 | 0.933 | Increase | 0.714 | 1 | 0.714 | Increase | 0.838 | 1 | 0.838 | Increase |
| China Everbright Bank | 0.713 | 0.864 | 0.825 | Increase | 0.787 | 1 | 0.787 | Increase | 0.795 | 0.919 | 0.866 | Increase |
| CITIC Bank | 0.871 | 0.883 | 0.987 | Decrease | 0.735 | 0.848 | 0.866 | Increase | 0.77 | 0.772 | 0.998 | Decrease |

Table 5-9 Data Calculation Results of 2015

| | Operating capacity index | | | | Profitability index | | | | Growth capacity index | | | |
|---|--------------------------|---------------------------|------------------|-----------------|----------------------|---------------------------|------------------|-----------------|-----------------------|---------------------------|------------------|-----------------|
| | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale |
| Industrial and Commercial Bank of China | 0.566 | 1 | 0.566 | Decrease | 1 | 1 | 1 | Unchanged | 0.784 | 1 | 0.784 | Decrease |
| Bank of China | 0.55 | 0.903 | 0.609 | Decrease | 0.895 | 0.911 | 0.982 | Increase | 0.701 | 1 | 0.701 | Decrease |
| China Construction Bank | 0.589 | 1 | 0.589 | Decrease | 0.998 | 1 | 0.998 | Increase | 0.707 | 0.954 | 0.741 | Decrease |
| Agricultural Bank of China | 0.397 | 0.881 | 0.451 | Decrease | 0.818 | 0.844 | 0.969 | Increase | 0.709 | 1 | 0.709 | Decrease |
| Bank of Communications | 0.7 | 0.871 | 0.804 | Decrease | 0.753 | 0.831 | 0.906 | Increase | 0.714 | 0.798 | 0.896 | Decrease |
| China Merchants Bank | 1 | 1 | 1 | Unchanged | 0.847 | 0.953 | 0.89 | Increase | 0.746 | 0.758 | 0.983 | Increase |
| Ping An Bank | 1 | 1 | 1 | Unchanged | 0.724 | 1 | 0.724 | Increase | 1 | 1 | 1 | Unchanged |
| Pudong Development Bank | 1 | 1 | 1 | Unchanged | 0.808 | 0.896 | 0.902 | Increase | 1 | 1 | 1 | Unchanged |
| China Minsheng Bank | 0.857 | 0.881 | 0.974 | Decrease | 0.832 | 0.93 | 0.895 | Increase | 1 | 1 | 1 | Unchanged |
| Huaxia Bank | 0.699 | 1 | 0.699 | Increase | 0.75 | 1 | 0.75 | Increase | 0.676 | 1 | 0.676 | Increase |
| China Everbright Bank | 0.806 | 0.976 | 0.826 | Increase | 0.747 | 0.899 | 0.831 | Increase | 1 | 1 | 1 | Unchanged |
| CITIC Bank | 0.91 | 1 | 0.91 | Decrease | 0.652 | 0.741 | 0.88 | Increase | 1 | 1 | 1 | Unchanged |

Table 5-10 Data Calculation Results of 2016

| | Operating capacity index | | | | Profitability index | | | | Growth capacity index | | | |
|---|--------------------------|---------------------------|------------------|-----------------|----------------------|---------------------------|------------------|-----------------|-----------------------|---------------------------|------------------|-----------------|
| | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale |
| Industrial and Commercial Bank of China | 0.595 | 1 | 0.595 | Decrease | 1 | 1 | 1 | Unchanged | 0.492 | 1 | 0.492 | Decrease |
| Bank of China | 0.586 | 0.902 | 0.65 | Decrease | 0.877 | 0.89 | 0.985 | Increase | 0.54 | 1 | 0.54 | Decrease |
| China Construction Bank | 0.631 | 1 | 0.631 | Decrease | 0.959 | 0.964 | 0.994 | Increase | 0.601 | 1 | 0.601 | Decrease |
| Agricultural Bank of China | 0.452 | 0.861 | 0.525 | Decrease | 0.814 | 0.83 | 0.98 | Increase | 0.454 | 0.86 | 0.527 | Decrease |
| Bank of Communications | 0.719 | 0.832 | 0.864 | Decrease | 0.71 | 0.781 | 0.908 | Increase | 0.872 | 1 | 0.872 | Decrease |
| China Merchants Bank | 1 | 1 | 1 | Unchanged | 0.908 | 1 | 0.908 | Increase | 1 | 1 | 1 | Unchanged |
| Ping An Bank | 1 | 1 | 1 | Unchanged | 0.813 | 1 | 0.813 | Increase | 1 | 1 | 1 | Unchanged |
| Pudong Development Bank | 1 | 1 | 1 | Unchanged | 0.793 | 0.889 | 0.892 | Increase | 0.97 | 1 | 0.97 | Decrease |
| China Minsheng Bank | 0.908 | 0.911 | 0.997 | Increase | 0.715 | 0.813 | 0.88 | Increase | 1 | 1 | 1 | Unchanged |
| Huaxia Bank | 0.797 | 1 | 0.797 | Increase | 0.725 | 1 | 0.725 | Increase | 1 | 1 | 1 | Unchanged |
| China Everbright Bank | 0.839 | 0.968 | 0.867 | Increase | 0.654 | 0.843 | 0.776 | Increase | 0.992 | 1 | 0.992 | Increase |
| CITIC Bank | 0.908 | 1 | 0.908 | Decrease | 0.609 | 0.709 | 0.859 | Increase | 0.897 | 1 | 0.897 | Decrease |

Table 5-11 Data Calculation Results of 2017

| | Operating capacity index | | | | Profitability index | | | | Growth capacity index | | | |
|---|--------------------------|---------------------------|------------------|-----------------|----------------------|---------------------------|------------------|-----------------|-----------------------|---------------------------|------------------|-----------------|
| | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale |
| Industrial and Commercial Bank of China | 0.605 | 1 | 0.605 | Decrease | 1 | 1 | 1 | Unchanged | 0.867 | 1 | 0.867 | Decrease |
| Bank of China | 0.561 | 0.828 | 0.678 | Decrease | 0.899 | 0.904 | 0.995 | Increase | 0.729 | 0.923 | 0.79 | Decrease |
| China Construction Bank | 0.655 | 1 | 0.655 | Decrease | 0.998 | 0.998 | 0.999 | Decrease | 0.814 | 1 | 0.814 | Decrease |
| Agricultural Bank of China | 0.485 | 0.919 | 0.527 | Decrease | 0.839 | 0.864 | 0.971 | Increase | 0.867 | 1 | 0.867 | Decrease |
| Bank of Communications | 0.732 | 0.796 | 0.919 | Decrease | 0.794 | 0.817 | 0.971 | Increase | 0.841 | 1 | 0.841 | Decrease |
| China Merchants Bank | 1 | 1 | 1 | Unchanged | 1 | 1 | 1 | Unchanged | 1 | 1 | 1 | Unchanged |
| Ping An Bank | 1 | 1 | 1 | Unchanged | 0.901 | 1 | 0.901 | Increase | 1 | 1 | 1 | Unchanged |
| Pudong Development Bank | 1 | 1 | 1 | Unchanged | 0.809 | 0.893 | 0.906 | Increase | 0.84 | 0.847 | 0.991 | Increase |
| China Minsheng Bank | 0.87 | 0.895 | 0.973 | Increase | 0.783 | 0.904 | 0.866 | Increase | 0.515 | 0.644 | 0.799 | Increase |
| Huaxia Bank | 0.796 | 1 | 0.796 | Increase | 0.717 | 1 | 0.717 | Increase | 0.8 | 1 | 0.8 | Increase |
| China Everbright Bank | 0.847 | 0.854 | 0.991 | Increase | 0.782 | 0.93 | 0.841 | Increase | 1 | 1 | 1 | Unchanged |
| CITIC Bank | 0.85 | 1 | 0.85 | Decrease | 0.677 | 0.754 | 0.899 | Increase | 0.404 | 0.606 | 0.667 | Increase |

Table 5-12 Data Calculation Results of 2018

| | Operating capacity index | | | | Profitability index | | | | Growth capacity index | | | |
|---|--------------------------|---------------------------|------------------|-----------------|----------------------|---------------------------|------------------|-----------------|-----------------------|---------------------------|------------------|-----------------|
| | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale | Technical efficiency | Pure technical efficiency | Scale efficiency | Return on scale |
| Industrial and Commercial Bank of China | 0.641 | 1 | 0.641 | Decrease | 1 | 1 | 1 | Unchanged | 0.738 | 1 | 0.738 | Decrease |
| Bank of China | 0.574 | 0.799 | 0.718 | Decrease | 0.941 | 0.945 | 0.995 | Increase | 1 | 1 | 1 | Unchanged |
| China Construction Bank | 0.725 | 1 | 0.725 | Decrease | 1 | 1 | 1 | Unchanged | 0.662 | 1 | 0.662 | Decrease |
| Agricultural Bank of China | 0.586 | 0.994 | 0.59 | Decrease | 0.83 | 0.843 | 0.985 | Increase | 1 | 1 | 1 | Unchanged |
| Bank of Communications | 0.764 | 0.775 | 0.986 | Increase | 0.792 | 0.814 | 0.973 | Increase | 0.777 | 0.78 | 0.996 | Increase |
| China Merchants Bank | 1 | 1 | 1 | Unchanged | 1 | 1 | 1 | Unchanged | 1 | 1 | 1 | Unchanged |
| Ping An Bank | 1 | 1 | 1 | Unchanged | 0.915 | 1 | 0.915 | Increase | 0.874 | 0.998 | 0.876 | Increase |
| Pudong Development Bank | 1 | 1 | 1 | Unchanged | 0.795 | 0.872 | 0.912 | Increase | 0.423 | 0.44 | 0.962 | Increase |
| China Minsheng Bank | 0.806 | 0.884 | 0.912 | Increase | 0.75 | 0.843 | 0.889 | Increase | 0.364 | 0.435 | 0.837 | Increase |
| Huaxia Bank | 0.741 | 1 | 0.741 | Increase | 0.692 | 1 | 0.692 | Increase | 1 | 1 | 1 | Unchanged |
| China Everbright Bank | 0.847 | 0.854 | 0.991 | Increase | 0.782 | 0.93 | 0.841 | Increase | 1 | 1 | 1 | Unchanged |
| CITIC Bank | 0.85 | 1 | 0.85 | Decrease | 0.677 | 0.754 | 0.899 | Increase | 0.404 | 0.606 | 0.667 | Increase |

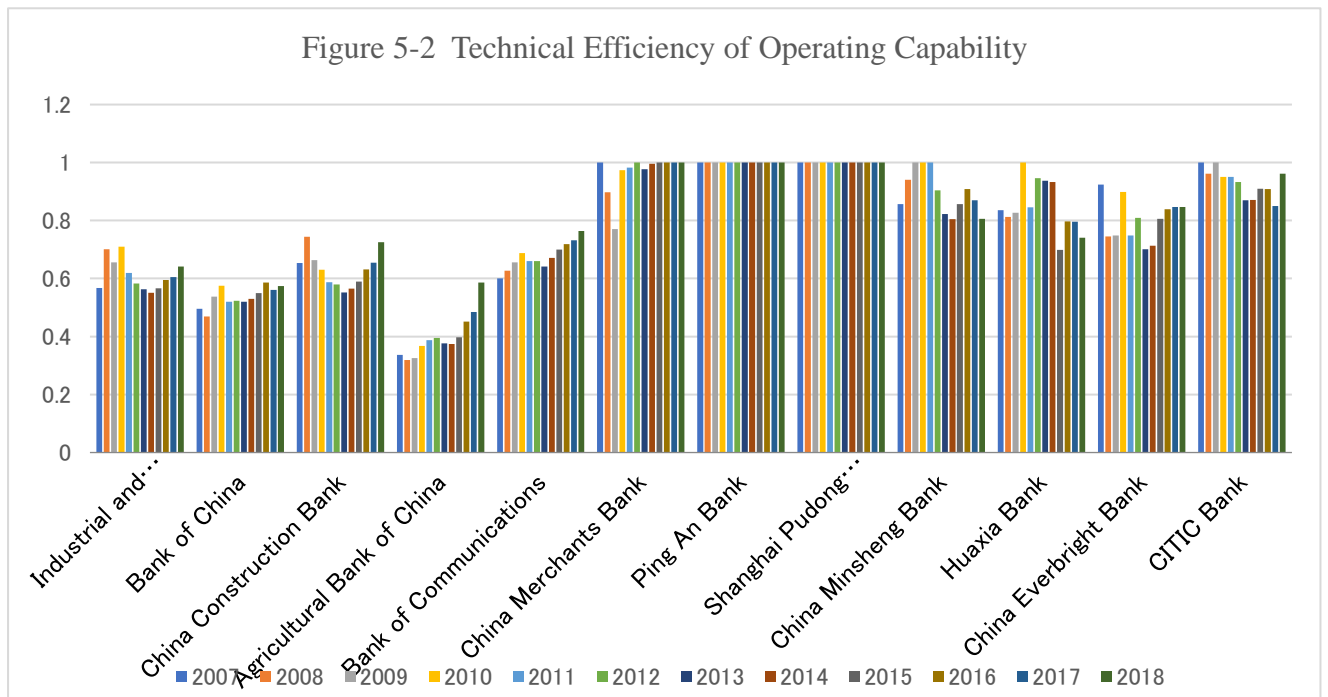
5.4.3 Analysis of Data Calculation Results

I. Comparison of the Same Efficiency Values of Banks in Different Years

Taking each bank of the study object as the abscissa and the efficiency value as the ordinate, the histogram of bank efficiency in each year is drawn to study the technical efficiency, pure technical efficiency and scale efficiency of each bank in both operating capacity and profitability.

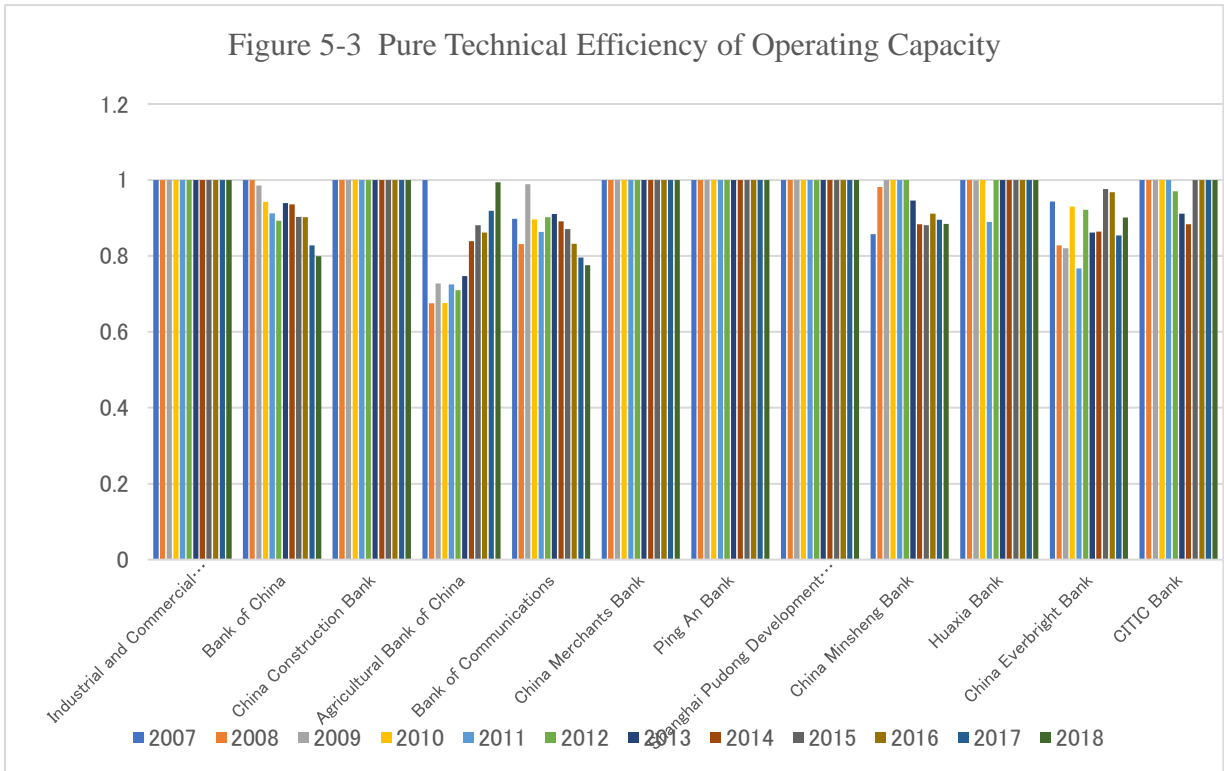
1. Operational Capacity Analysis

In terms of technical efficiency, non-state-owned commercial banks are generally higher than state-owned commercial banks. This is mainly reflected in the fact that the average technical efficiency value of the four banks, namely, ICBC, BOC, CCB and BCM, is only 0.57. Among the state-owned commercial banks, the Agricultural Bank of China has the lowest average technical efficiency value, which is only 0.40. CCB is relatively good, and its average technical efficiency value during 2007-2018 is 0.61. The average technical efficiency of non-state-owned commercial banks is 0.92, which is nearly 1.61 times that of state-owned commercial banks. The highest value of technical efficiency is 1(DEA effective). Minsheng Bank and Pudong Development Bank, as the optimal DEA units, have valid values of 1 for 12 years, followed by China Merchants Bank, with valid values of 1 for four consecutive years starting from 2015.

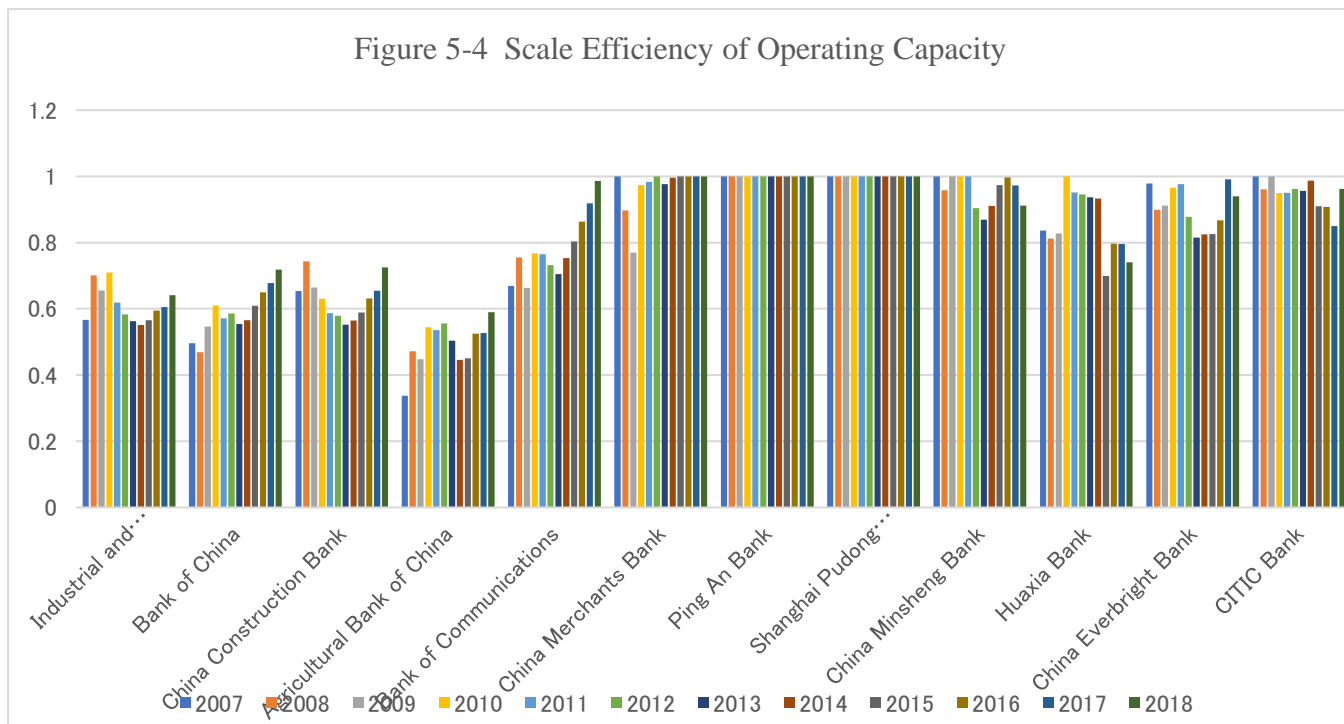


From the pure technical efficiency point of view, the Industrial and Commercial Bank and the Construction Bank of the state-owned commercial banks are good as a whole and have relative stability. From 2007 to 2018, the pure technical efficiency has been kept at 1, showing the maturity and stability of the organizational structure and division of labor of the state-owned banks. Non-state-owned commercial banks also performed well, especially China Merchants Bank, Pudong Development Bank and Ping An Bank, with pure technical efficiency values of 1 for 12 consecutive years from 2007 to 2018. Generally speaking, the efficiency value of non-state-controlled large commercial banks controlled is slightly higher than that of state-owned commercial banks, with the average values of 0.97 and 0.92 respectively. This shows that the management of non-state-owned commercial banks has been on the road of compliance from the beginning.

Figure 5-3 Pure Technical Efficiency of Operating Capacity



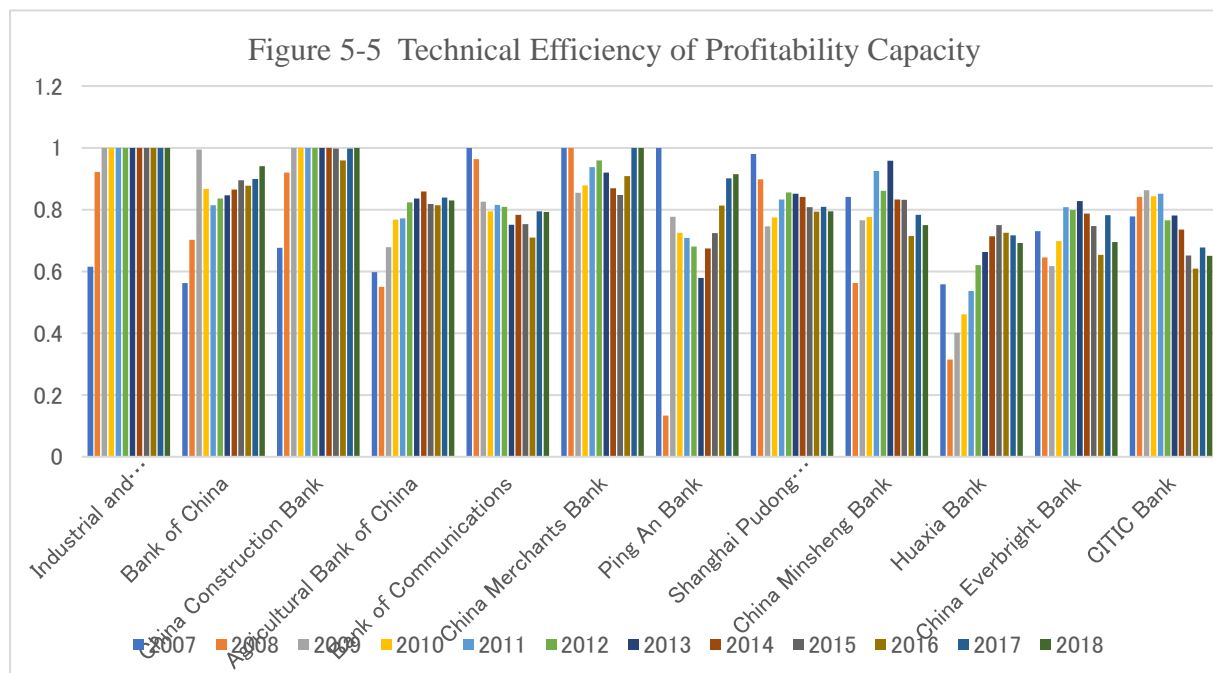
In terms of scale efficiency of operation capability, the performance of each bank is roughly the same as that of its technical efficiency. The low scale efficiency of state-owned commercial banks in operation shows that they have not given full play to their scale advantages and there is still the possibility of substantial improvement in performance. Although non-state-owned commercial banks are generally higher than state-owned commercial banks in terms of operation, they still show a trend of increasing scale efficiency (scale efficiency value < 1), and their operation is relatively stable, with great room for improvement in performance. Non-state-owned commercial banks can further expand their scale.



2. Profitability Analysis

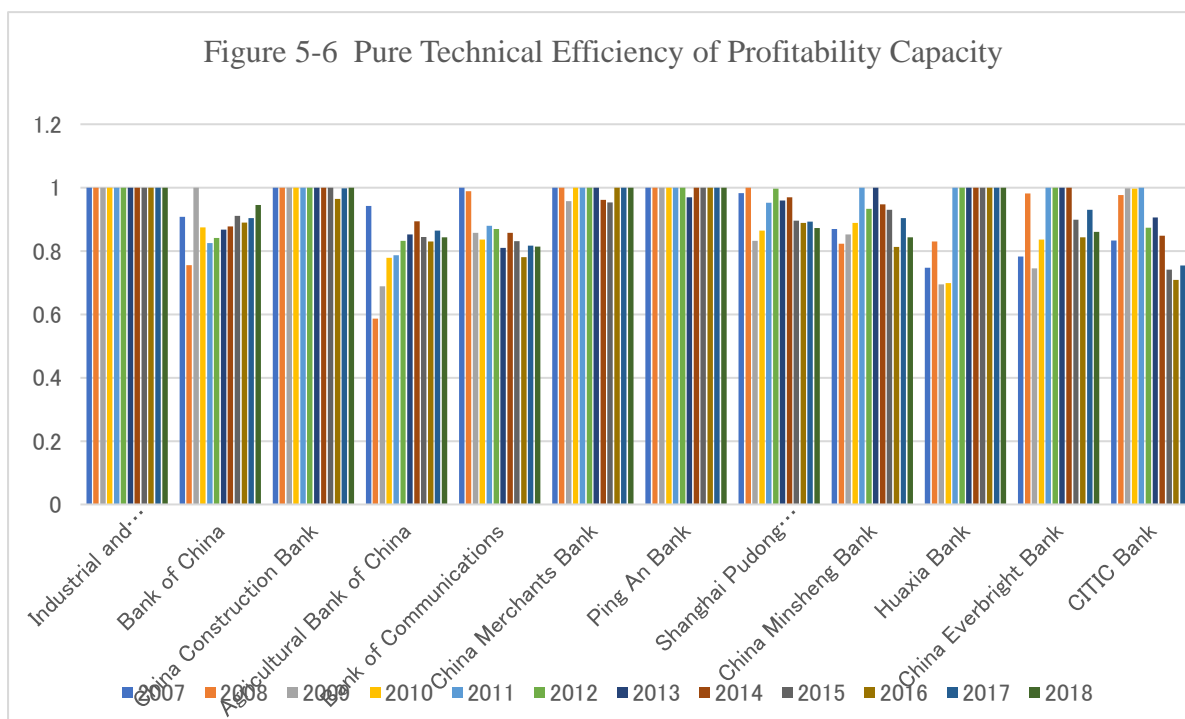
From the technical efficiency point of view, the state-controlled large commercial banks are slightly higher than the small and medium-sized joint-stock commercial banks, with the average values of 0.77 and 0.67 respectively. Moreover, each state-owned commercial bank has its own comparative advantages, especially the Industrial and Commercial Bank of China, which has achieved 10 consecutive years of effective profit (DEA =1), which is related to the support of national policies on the one hand, and the large local and foreign currency deposit and loan balances of state-controlled commercial banks on the other. Among non-state-owned commercial banks, China Merchants Bank has obvious advantages, with DEA values of 1 in 2007-2008 and 2017-2018, with an average value of 0.93, second only to Industrial and Commercial Bank of China and China

Construction Bank with an average value of 0.96.

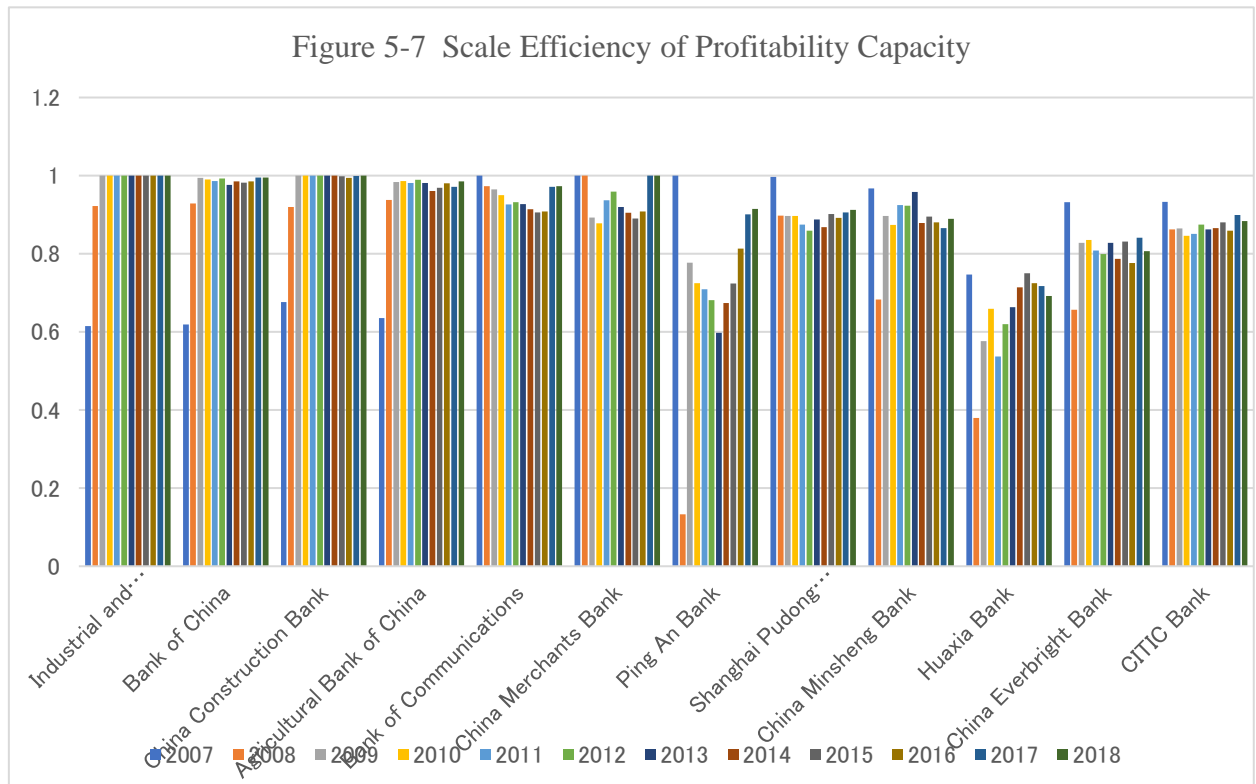


From a purely technical efficiency point of view, the banks are roughly equivalent and relatively stable, which shows that the overall input and output of China's commercial banks are relatively stable, and the ratio of bank income increase to cost input is synchronized. Industrial and Commercial Bank of the state-owned commercial banks still have advantages, with DEA=1 for 12 consecutive years. Agricultural Bank of the state-owned commercial banks and CITIC Bank of the non-state-owned commercial banks are at a relative disadvantage. On the whole, there is little difference in the average pure technical efficiency between state-owned commercial banks and non-state-owned commercial banks, with the values of 0.91 and 0.93

respectively.

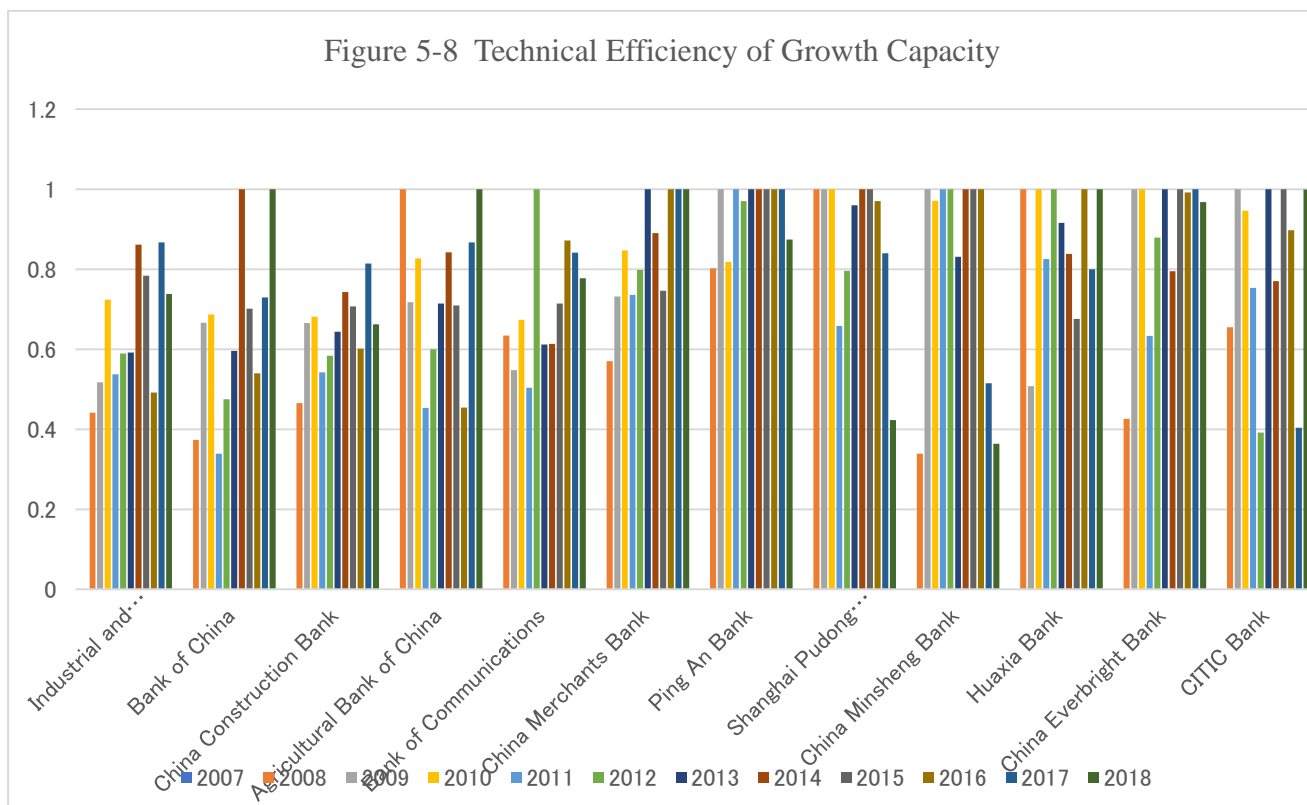


In terms of scale efficiency of profitability, the performance of state-owned commercial banks as a whole is better than that of non-state-owned commercial banks, with average values of 0.95 and 0.83 respectively. There is still room for improvement for non-state-owned commercial banks, such as Huaxia Bank, with an average value of 0.65, and there is still a certain gap with other non-state-owned commercial banks. Among non-state-owned commercial banks, China Merchants Bank performed best, with DEA=1 in terms of profitability, scale and efficiency from 2007 to 2008 and from 2017 to 2018.

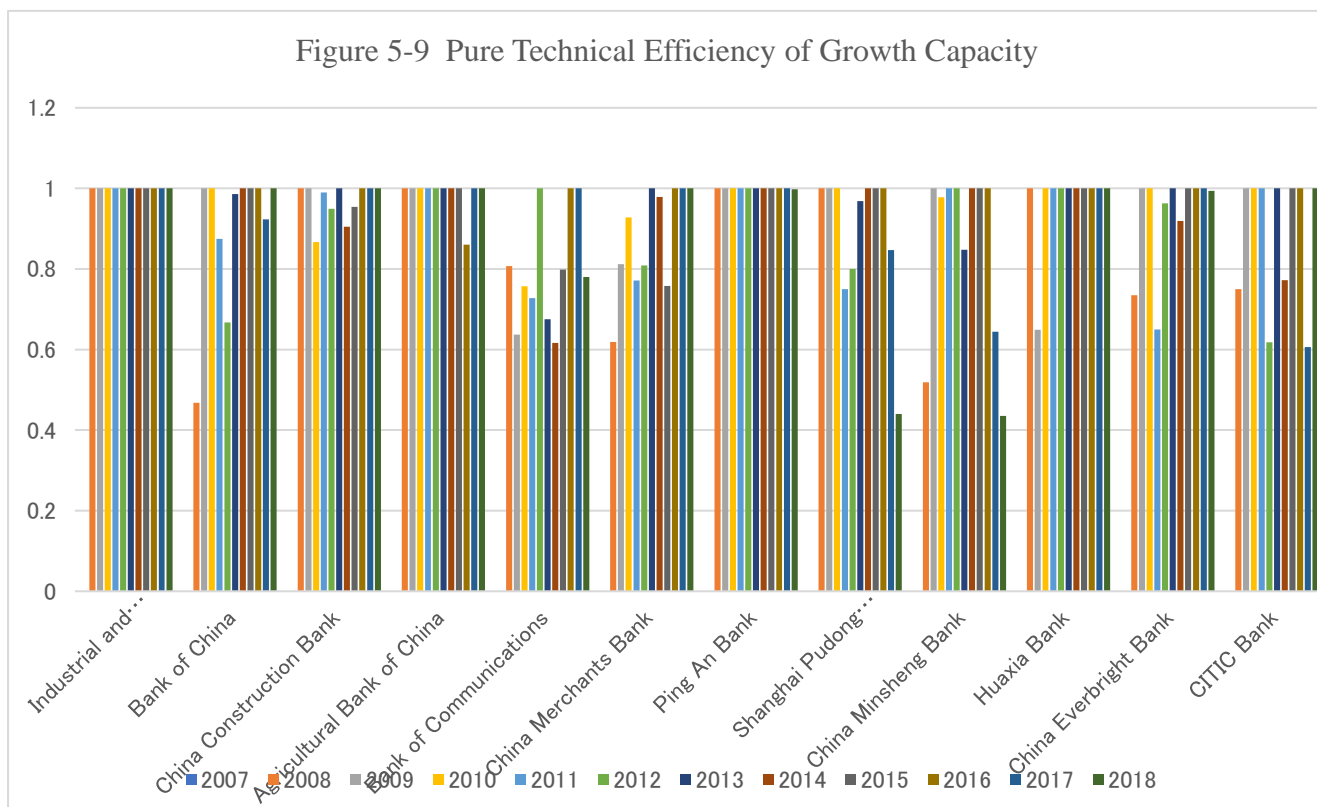


3. Analysis of Growth Capacity

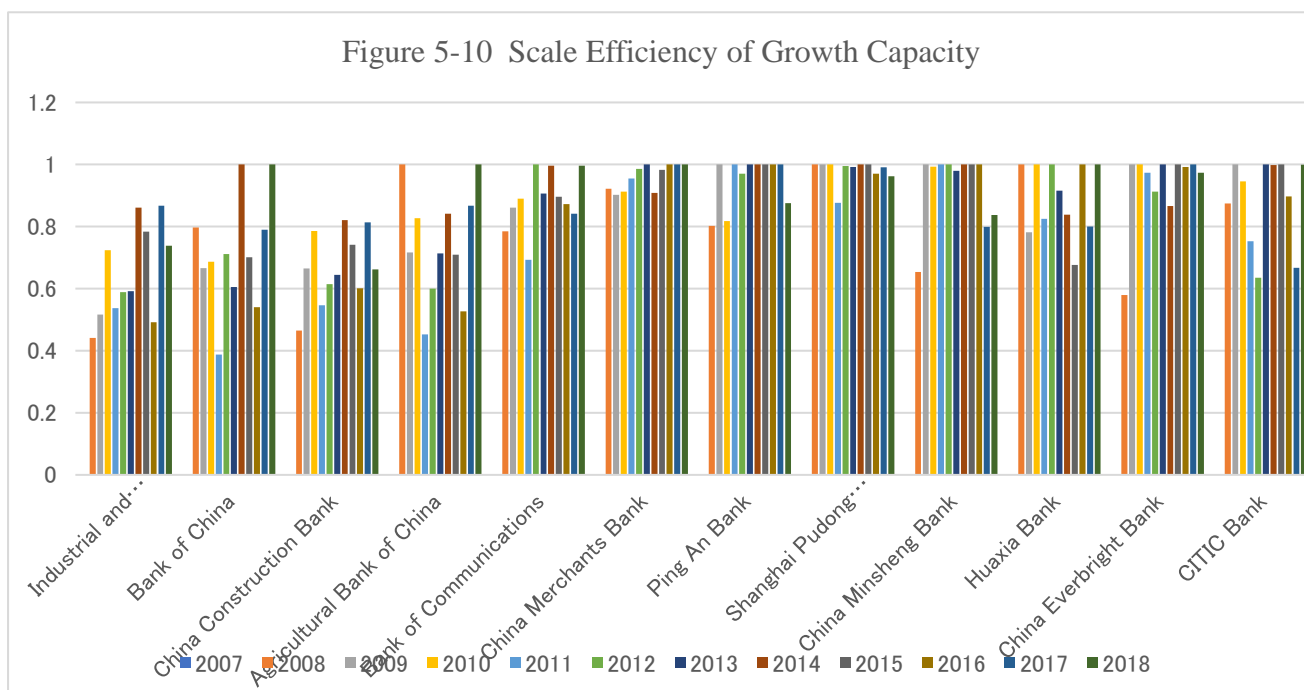
Judging from the technical efficiency of growth capacity, banks are uneven. The boundaries between large state-controlled commercial banks and small and medium-sized joint-stock commercial banks are no longer reflected in their differences in growth capacity. Moreover, there is a trend that the technical efficiency of the state-controlled commercial banks has declined significantly from 2016, with the overall average value of only 0.59. Among non-state-owned commercial banks, China Merchants Bank and Ping An Bank have higher technical efficiency in overall growth capacity. China Merchants Bank had a technical efficiency of 1 in 2016-2018 and Ping An Bank had a technical efficiency of 1 during 2013 -2017.



Not only the technical efficiency value is not stable enough, but also the pure technical efficiency value of sample banks is not stable enough. On the whole, the average value and stability of the growth capacity of state-owned commercial banks are higher than those of non-state-owned commercial banks. Among the sample banks, the Industrial and Commercial Bank of China has the best pure technical efficiency in terms of growth capacity with the value of 1 during the sample period. Among the non-state-owned commercial banks, Ping An Bank has the best performance with a pure technical efficiency of 1 in terms of growth capacity from 2007 to 2017.



In terms of Scale Efficiency of Growth Capacity, the performance of non-state-owned commercial banks is more prominent than that of state-owned commercial banks, with China Merchants Bank as the best. The average value during the sample period is 0.96, that of state-owned commercial banks is 0.70, and that of non-state-owned commercial banks is 0.93. There is still a certain gap. This shows that non-state-owned commercial banks are in the overall expansion stage at this stage.



5.5 Summary

This chapter studies the business performance of sample banks from 2007 to 2018, and uses CRS model with constant model reward for calculating and analyzing. It is found that non-state-owned commercial banks are generally superior to state-owned commercial banks in terms of technical efficiency of operating capacity; Industrial and Commercial Bank of China, Construction Bank of China, China Merchants Bank, Shanghai Pudong Development Bank and Ping An Bank perform best in terms of pure technical efficiency of operating capacity, which is close to 1; non-state-owned commercial banks are generally better than state-owned commercial banks in terms of scale efficiency of operating capacity. In terms of technical efficiency of profitability, Industrial and Commercial Bank and Construction

Bank that are state-owned commercial banks are the best; in terms of pure technical efficiency of profitability, Industrial and Commercial Bank and Ping An Bank perform well, and in terms of scale efficiency of profitability, state-owned commercial banks are generally superior to non-state-owned commercial banks. In terms of technical efficiency of growth capacity, non-state-owned commercial banks are generally better than state-owned commercial banks; in terms of pure technical efficiency of growth capacity, Industrial and Commercial Bank and Shanghai Pudong Development Bank are the most prominent; in terms of scale efficiency of growth capacity, non-state-owned commercial banks are generally better than state-owned commercial banks.

6. Regression Analysis of the Impact of Equity Structure on the Performance of Commercial Banks

6.1 Qualitative analysis

Domestic and foreign scholars have achieved rich results in the study of the impact of ownership concentration and the state-owned and non-state-owned shareholders on operating performance. The state-owned shareholders have dual goals: profit goal and administrative goal. Profit goal refers to the quality of the company's own operation and development. Administrative goal refers to the realization of macro-economic and policy goals and the positive support for the development of the state-owned economy. For

domestic commercial banks in China, they have the particularity of taking the state-owned shares as the main body, which makes the administrative goal of the state-owned shareholders replace the profit goal in the bank governance, thus damaging the business performance of commercial banks. At the same time, the above analysis shows that the state-owned shareholders is easy to cause insider control problems, which is not conducive to improving the business performance of commercial banks. Therefore, there should be a certain negative correlation between the proportion of state-owned shares and the business performance of banks.

Foreign shareholders are generally high-quality international financial companies. When the company is in a good state of scientific incentive and restraint mechanism, standardized operation and management system, and perfect corporate governance mechanism, the shareholders' meeting and management will consider to invest internationally. When the shareholding ratio of foreign shares reaches a certain level, banks and foreign institutional investors form a stable strategic investment relationship, which promotes the introduction of talents, the improvement of technology and management level, and the internationalization of business philosophy of China's commercial banks. From this perspective, the introduction of foreign shares promotes the bank's business performance to a certain extent, and the higher the proportion of foreign shares, the more stable and sustainable the promotion.

As for the bank president, it is mainly responsible for the company's

administrative management and implementation of decision making of the company and the main person responsible for the company's daily business activities. Although the president needs to serve the interests of shareholders, maintain and increase the value of operating assets, use its political connection to strive for more favorable financing conditions for the enterprise, and reduce the cost of capital; it may also use the company's resources to establish political connection with officials for private interests, thus resulting in the rise of the company's operating costs and the reduction of business performance. When the self-interest brought by moral hazard is equal to or even greater than the net income brought by serving the interests of shareholders, the impact of political connection on the company's performance will become inapparent or even negative

6.2 Model design and regression analysis

Model 1:

$$Perfor_{i,t} = a + bIDR_{i,t} + cAsset_{i,t} + dGroup_{i,t} + \mu_{i,t}$$

Perfor denotes the bank's income, with ROA (Return on Assets) (=income / total assets) as an indicator. IDR is the current Loan-deposit Ratio of the bank. Asset denotes the size of the bank, with the logarithm of the bank's total assets as an indicator. Group is a dummy variable, which is set as "0" for a state-owned bank and as "1" for a non-state-owned bank.

Due to the limitation of statistical receipts, the sample period of this regression analysis is from 2005 to 2018. The research sample includes five

state-owned commercial banks: Industrial and Commercial Bank of China, Agricultural Bank of China, Bank of China, China Construction Bank and Bank of Communications. There are altogether 7 non-state-owned commercial banks, including China Merchants Bank, Pudong Development Bank, China CITIC Bank, China Everbright Bank, Huaxia Bank, China Minsheng Bank and Ping An Bank.

Since both the left variable ROA and the right variable Asset of the model use the total assets of the bank, a multivariate covariance test is performed here first. Based on the test results, it is determined whether the regression analysis can be performed according to Model 1.

The test results are as follows:

Analysis of Variance Table

Model 1: roa ~ asset * aov

Model 2: roa ~ asset + aov

| | Res.Df | RSS | Df | Sum of Sq | F | Pr(>F) |
|---|--------|-----------|----|-------------|--------|--------|
| 1 | 206 | 0.0012000 | | | | |
| 2 | 207 | 0.0012007 | -1 | -6.3702e-07 | 0.1094 | 0.7412 |

The p value is greater than 0.05, which proves that the interaction between ROA and Asset is not significant, so it indicates that the regression analysis can be performed on Model 1.

The results of the regression analysis are shown in Table 1.

Table 6-1 Results of the Regression Analysis on Model 1

| | Estimated Value | t Value | p Value |
|-----------------|-----------------|---------|-----------------|
| IDR | 0.0027 | 3.7362 | 0.0002 (***) |
| ASSET | 0.0014 | 7.1143 | 2.144e-11 (***) |
| GROUP | 0.0011 | 1.2946 | 0.1955 |
| R ² | 0.26313 | | |
| R ^{*2} | 0.25240 | | |

Note: (***) denotes $p < 0.001$, indicating the difference is significant.

As R^{*2} is small, we believe that the fitting degree of Model 1 is relatively general. It is generally considered that the regression analysis used in this study is the panel data analysis, so such R^{*2} is still within a reasonable range.

From the results of the regression analysis, we see that the estimates are all positive, indicating that both the bank's current loan-deposit ratio IDR and its total assets have a significant influence on the bank's income. However, the p value of the Group variable is greater than 0.05, which proves that whether a bank is a state-owned bank or a non-state-owned bank has no significant influence on the bank's income.

Model 2:

$$BinR_{i,t} = a + bAsset_{i,t} + cSR5_{i,t} + dSR1_{i,t} + \mu_{i,t}$$

BinR is the interest income / total operating income. Asset denotes the asset size of the bank, with the logarithm of the bank's total assets as an indicator. SR5 is the proportion of the state-owned shares (based on the original data, the proportion of the state-owned shares held by the top five shareholders was calculated). SR1 is the proportion of the state-owned shares held by the largest shareholder. The sample span is 2008-2018.

The results of the regression analysis are shown in Table 2.

Table 6-2 Results of the Regression Analysis on Model 2

| | Estimated Value | t Value | p Value |
|-----------------|-----------------|---------|-----------------|
| ASSET | -5.0659 | -7.8187 | 2.587e-12 (***) |
| SR5 | -0.2134 | -4.2497 | 4.322e-05 (***) |
| SR1 | 0.1824 | 3.2878 | 0.0013 (**) |
| R ² | 0.63519 | | |
| R ^{*2} | 0.59154 | | |

Note: (“***)” denotes $p < 0.001$, (“**”) denotes $p < 0.01$, indicating the difference is significant.

The value of R^{*2} is relatively large, which indicates the fitting degree of Model 2 is good.

Based on the results of the regression analysis, we can see that the variable SR5, i.e. the proportion of the state-owned shares, and the bank's total assets Asset both have a significant influence on the interest income / the total operating income. Besides, since the estimated values of SR5 and the total

assets are negative, the larger the size of the bank is, the higher the proportion of the state-owned shares will be, while the ratio of the interest income to the total operating income will not increase. Similarly, we also see that the proportion of the state-owned shares held by the largest shareholder SR1 also has a significant influence on the interest income / the total operating income. Meanwhile, the estimated value is positive, proving that the higher the proportion of the state-owned shares held by the largest shareholder is, the higher the ratio of the interest income to the total operating income will be. This result shows that the largest state-owned shareholder has a certain positive effect on the bank's income.

Model 3:

$$BcomR_{i,t} = a + bAsset_{i,t} + cSR5_{i,t} + dSR1_{i,t} + \mu_{i,t}$$

BcomR is the ratio of the fees and commissions income to the total operating income. Asset denotes the asset size of the bank, with the logarithm of the bank's total assets as an indicator. SR5 is the proportion of the state-owned shares (based on the original data, the proportion of the state-owned shares held by the top five shareholders was calculated). SR1 is the proportion of the state-owned shares held by the largest shareholder. The sample span is 2008-2018.

The results of the regression analysis are shown in Table 3.

Table 6-3 Results of the Regression Analysis on Model 3

| | Estimated Value | t Value | p Value |
|-----------------|-----------------|---------|-----------------|
| ASSET | 4.3197 | 8.7120 | 2.297e-14 (***) |
| SR5 | 0.1984 | 5.1630 | 1.008e-06 (***) |
| SR1 | -0.1451 | -3.4173 | 0.0009 (***) |
| R ² | 0.70119 | | |
| R ^{*2} | 0.66544 | | |

Note: (“***)” denotes $p < 0.001$, indicating the difference is significant.

The value of R^{*2} is relatively large, which indicates the fitting degree of Model 3 is good.

According to the results of the regression analysis, both the variable SR5 and Asset have a significant influence on the ratio of fees and commissions income to total operating income. Besides, since the estimated value of SR5 is positive, the higher the proportion of the state-owned shares held by the top five shareholders is, the higher the ratio of the fees and commissions income to the total operating income will be. Meanwhile, we also see that the proportion of the state-owned shares held by the largest shareholder SR1 also has a certain influence on the ratio of the fees and commissions income to the total operating income. However, the estimate is negative, indicating that the ratio of the fees and commissions income to the total operating income will not increase even if the largest shareholder has a higher proportion of state-owned shares.

Model 4:

$$Bop_{i,t} = a + bAsset_{i,t} + cSR5_{i,t} + dSR1_{i,t} + \mu_{i,t}$$

Where, Bop is the ratio of the bank's operating expenses to the total operating costs. Asset denotes the asset size of the bank, with the logarithm of the bank's total assets as an indicator. SR5 is the proportion of the state-owned shares (based on the original data, the proportion of the state-owned shares held by the top five shareholders was calculated). SR1 is the proportion of the state-owned shares held by the largest shareholder. The sample span is 2008-2018.

The results of the regression analysis are shown in Table 4.

Table 6-4 Results of the Regression Analysis on Model 4

| | Estimated Value | t Value | p Value |
|-----------------|-----------------|---------|----------------|
| ASSET | 1.6470 | 8.0550 | 7.95e-16 (***) |
| SR5 | 0.2168 | -2.3788 | 0.0173 (*) |
| SR1 | 0.1824 | 2.7246 | 0.0064 (**) |
| R ² | 0.56751 | | |
| R ^{*2} | 0.53643 | | |

Note: (“*”) denotes $p < 0.05$, (“**”) denotes $p < 0.01$, (“***”) denotes $p < 0.001$, indicating the difference is significant.

The value of R^{*2} is relatively high, which indicates the fitting degree of Model 4 is good.

Based on the regression analysis results, both the proportion of the state-owned shares (SR5) and the bank's total assets (Asset) have a significant influence on the ratio of the operating expenses to the total operating costs. Besides, since the estimated value of SR5 is positive, the higher the proportion of the state-owned shares is, the higher the ratio of the operating expenses to the total operating costs will be. The proportion of the state-owned shares held by the largest shareholder SR1 also has a significant influence on the ratio of the operating expenses to the total operating costs. Meanwhile, the estimated value is positive, which proves that the higher the proportion of the state-owned shares held by the largest shareholder is, the higher the ratio of the operating expenses to the total operating costs will be.

Model 5:

$$Bimp_{i,t} = a + bAsset_{i,t} + cSR5_{i,t} + dSR1_{i,t} + \mu_{i,t}$$

Where *Bimp* is the ratio of the bank's assets impairment to the total operating costs. *Asset* denotes the asset size of the bank, with the logarithm of the bank's total assets as an indicator. *SR5* is the proportion of the state-owned shares (based on the original data, the proportion of the state-owned shares held by the top five shareholders was calculated). *SR1* is the proportion of the state-owned shares held by the largest shareholder. The

sample span is 2008-2018.

The results of the regression analysis are shown in Table 5.

Table 6-5 Results of the Regression Analysis on Model 5

| | Estimated Value | t Value | p Value |
|-----------------|-----------------|---------|-----------------|
| ASSET | -5.3689 | -4.9902 | 2.122e-06 (***) |
| SR5 | -0.1515 | -1.8169 | 0.0718 |
| SR1 | 0.2324 | 2.5226 | 0.0129 (*) |
| R ² | 0.35122 | | |
| R ^{*2} | 0.27358 | | |

Note: (“*”) denotes $p < 0.05$, (“***”) denotes $p < 0.001$.

The value of R^{*2} is small, but it is within the reasonable range, indicating the fitting degree of Model 5 is relatively general.

From the regression analysis results, since the p-value of the variable SR5 is greater than 0.05, which proves that the proportion of the state-owned shares held by the top five shareholders has no significant influence on the bank’s asset impairment / total operating costs. The proportion of the state-owned shares held by the largest shareholder SR1 and the bank’s total assets Asset have a significant influence on the bank’s asset impairment / total operating costs. Meanwhile, the estimated value of SR1 is positive, it indicates that there is a trend in current Chinese commercial banks that the higher the proportion of the state-owned shares held by the largest shareholder is, the higher the ratio of the bank’s assets impairment to the

total operating costs will be.

6.3 Regression analysis conclusion

According to all the regression analysis results above, by comparing the empirical results among the entire samples, we find that whether a bank is a state-owned bank or a non-state-owned bank has no significant influence on the bank's income. But the largest state-owned shareholder has a certain positive effect on the bank's income. The higher the proportion of the state-owned shares held by the top five shareholders is, the higher the ratio of the fees and commissions income to the total operating income will be. On the other hand, Higher state-owned shares will lead to higher operating expenses. And the higher proportion of the state-owned shares held by the largest shareholder is, the higher ratio of the bank's assets impairment to the total operating costs will be.

7. Summary

7.1 Research conclusion

On the basis of tracing back the reform and development process of Chinese commercial banks and the problems existing in each stage, this article establishes relevant performance evaluation system through panel data to make multi-dimensional evaluation on the performance of state-owned commercial banks and non-state-owned commercial banks. Through data

envelopment analysis(DEA), it selects CRS model with constant returns on scale, makes empirical analysis on the data of state-owned commercial banks and non-state-owned commercial banks, analyzes the causes of performance differences, and puts forward research and judgment on the future development of Chinese commercial banks.

Through panel data and empirical analysis, this paper evaluates the performance of state-owned commercial banks and non-state-owned commercial banks. The analysis results of panel data show that the scale strength of state-owned commercial banks is still superior to that of non-state-owned commercial banks. In terms of profitability, the gap between state-owned commercial banks and non-state-owned commercial banks is gradually narrowing, but state-owned commercial banks are still at an advantage. In addition, commercial banks have moved from relying solely on interest income to diversified income such as intermediate income. In terms of safety capability, due to the strict control of commercial banks by the Chinese government, the safety management capability and risk tolerance capability of commercial banks are increasing year by year. The safety management capabilities of state-owned commercial banks and non-state-owned commercial banks are almost the same. In terms of capital flow capacity, the state-owned commercial banks and non-state-owned commercial banks as a whole show a trend of convergence and good development.

The result of DEA empirical analysis shows that the technical efficiency in

operation capacity of non-state-owned commercial banks is generally higher than that of state-owned commercial banks, and the technical efficiency in profitability of large state-controlled commercial banks is slightly higher than that of non-state-owned commercial banks. This result further explains the comparative result of panel data in the empirical aspect.

Then, through regression analysis, The increase of the proportion of state-owned shares will have a positive effect on operating income, but it will cause higher operating expenses and asset impairment at the same time. State-owned shares mean a higher degree of political affiliation, it can bring more capital resources and customer resources to the bank. So it has a positive effect on the bank's income. At the same time, because the state-owned Banks are under the control of the state, they have to shoulder more policy guiding functions besides profits. Therefore, when implementing the national policies, they sometimes have to bear higher risks, such as lending to the state-supported but high-risk emerging enterprises, resulting in non-performing loans and asset impairment sometimes.

State-owned commercial banks is large-scale but inefficient. The imbalance of supply and demand structures of Chinese commercial banks also leads to the difference in the quality of deposits and loans in state-owned commercial banks and non-state-owned commercial banks. In addition, compared with state-owned commercial banks, non-state-owned commercial banks have a late start and strong drive for profit maximization, which leads to the advantages of non-state-owned commercial banks in the construction of

talent echelon.

Compared with non-state-owned commercial banks, state-owned commercial banks have strong capital strength and huge payment and settlement network, and hold huge customer resources. Now, state-owned commercial banks participate in the capital market through listing, which expands the scale of the capital market, enhances the product supply capacity of the market, and improves the liquidity of the market. Besides, the coexistence of state-owned commercial banks and non-state-owned commercial banks may restrain the irrational fluctuations of the market to a certain extent, which reduces the risk of market operation and improves the efficiency of the capital market. The coexistence of non-state-owned commercial banks and state-owned commercial banks promotes the healthy competition in China's financial market and solves the disadvantages of Chinese commercial banks of low capital adequacy ratio and few business varieties to a certain extent.

7.2 Limitations of study and future prospects

1. The state-owned commercial banks are a complex and changeable dynamic system. Therefore, factors that affect the core competitiveness of state-owned commercial banks come from various aspects. When designing the evaluation index system, this paper focuses on the impact of internal factors, instead of considering the impact of the market structure and market environment on the core competitiveness. It should be further supplemented

in the subsequent research and study.

2. For the core competitiveness evaluation index system itself, it contains many indexes. This paper takes the theoretical research perspective of economics as priority, focuses on four first-class indexes, 12 second-class indexes and several auxiliary index systems, and establishes the core competitiveness evaluation index system of state-owned commercial banks. Quantitative expansion and structural optimization of the indexes should be done in a more comprehensive and in-depth way in the follow-up research to make the evaluation results more instructive.

3. Since 2006, China's market has been opened to the outside world in an all-round way, and the trend of financial market globalization has become increasingly clear. Today, with the rapid development of interest rate liberalization, the competition between the main commercial banks of Western developed countries and China's state-owned commercial banks has become increasingly fierce. Meanwhile, after decades of development, China has gradually shown some joint-stock commercial banks with its own characteristics and have considerable influence in the regional or national markets. In this paper, only five state-owned commercial banks and seven non-state-owned commercial banks are used to evaluate the core competitiveness. We should further consider joint-stock commercial banks with considerable influence, including the main urban commercial banks, rural commercial banks, private banks and foreign banks for the selection of evaluation units, so as to more accurately measure the core competitiveness

of state-owned commercial banks and non-state-owned commercial banks. The evaluation results obtained in this way will be more in line with the actual situation, and the countermeasures to cultivate and enhance the core competitiveness of state-owned commercial banks will also be more valuable.

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