

# **Banking Sector Reforms and Commercial Bank Performance in China**

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## **Abstract**

The Chinese banking sector has gone through a consistent process of the reform which includes liberalization of the business to foreign banks, privatization and listing bank shares, allowing diversifications into intermediary business beyond the traditional deposit and loan activities. In the mean time, the changing structures of the banking sector and the favourable economic condition in the recent decade have promoted the development of the commercial banks. We collect a sample of 80 Chinese commercial banks for the period from 2000 to 2008, and investigate the determinants of bank performance. Aggregate index measures of performance are constructed based on proxy variables that assess the quality of assets, capital adequacy, profitability, and liquidity. Potential determinants at bank level, industry level, and macroeconomic level are examined in the panel data models. We find that city commercial banks out-perform the national banks which include state owned big four banks and joint-stock banks. Our evidence also suggests lower financial leverage, higher off-balance sheet activities, and larger size of the bank are associated with better performance. At industry level, concentration of the banking sector has allowed better performance due to less competitive environment. The liberalization of the banking business to foreign banks in 2003 has an encouraging effect on the banking sector, although the evidence is not statistically significant. At macroeconomic level, higher per capita GDP and lower unemployment has been significantly related to better bank performance.

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## 1. Introduction

Within the context of the economy transition, the Chinese government has embarked on a series of financial reform programs since 1979. The program initially focused on institutional reforms to the banking system in the 1980s. The system moved from a mono-bank system, with the People's Bank of China (PBC) functioning as a commercial bank, supervisor and government treasury, to a two-tier system when the four state-owned specialized banks were established (Cousin, 2007; Shirai, 2002). PBC retains as a central bank, while the commercial operation was split into four specialized banks: the Industrial and Commercial Bank of China (ICBC), the China Construction Bank (CCB), Bank of China (BOC) and the Agricultural Bank of China (ABC), so-called "Big Four". The second reform wave started from 1994, which entailed a progressive move of commercializing the Big Four by separating commercial lending and policy lending and establishing three policy banks to take over the function of policy lending (Brean, 2007; Cousin, 2007; Shirai, 2002; Yao et al, 2007). The Commercial Bank Law, enacted in 1995, also recognized the status of state-owned specialized banks as commercial banks and defined the business scope for commercial banks (Brean, 2007; Cousin, 2007; Zhong, 2007). After the Asian financial crisis in 1997, further reform was taken on state-owned banks, including issuing a 10 year bond for capital injection (García-Herreroa, Gaviláb & Santabárbara, 2009), establishing four asset management companies (AMCs) to transfer NPLs from the Big Four respectively at face value (Cousin, 2007; García-Herreroa, Gaviláb & Santabárbara, 2009; Yao et al, 2007), and promulgating prudential accounting principles and a loan classification system (Liu, Wu & Liu, 2006). Apart from the reform of the big four, non-state joint-stock banks and about 90 city commercial banks were allowed to establish to compete with SOCBs (Yao et al, 2007).

In 2001, the WTO entry of China heralded the third stage of reform in China's banking sector. As part of its WTO accession agreement the Chinese government committed to extending national treatment to foreign banks by the end of 2006 (Laurenceson & Zhao, 2008). "Share-holding reform" has been initiated in commercial banks since 2003, which mainly refers to financial restructuring, reform of corporate governance and public listing of bank shares on stock markets both at home and abroad (Brean, 2007). First, the unprecedented financial restructuring has been conducted through capital injections and the stripping of NPLs. Second, restructuring was also accomplished in a bail-out of NPLs. In this wave, auctions have been used to transfer NPLs so that only the highest bidding asset management companies. As a part of share-holding reform, greater foreign equity participation has been introduced in Chinese banks (Berger et al, 2006; Brean, 2007; Pogson, 2007; Podpiera, 2006).

While the Chinese banks were opening their ownership to foreign participants, they were also taking initiatives to offer their shares to both domestic and overseas exchanges. Public listing of bank shares on stock exchanges is expected to impose the constructive influences on a bank's corporate governance, management and performance. Brean (2007) explains that the regulatory requirements imposed by stock exchanges set (usually high) minimum standards for capital adequacy, current performance, reporting and transparency. In addition, publicly listed banks are subject to exchange-set standards for the structure of corporate governance. Although two national joint-stocks (Shenzhen Development Bank and Pudong Development Bank) listed some of their shares from as early as 1991, the majority took place in the new century, when listing was extended to include state-owned and city commercial banks. In 2005, CCB issued IPO and raised US\$8

billion on the Hong Kong Stock Exchange. It was followed by BOC's largest IPO issue (US\$9.7 billion) on the Hong Kong Exchange as well as ICBC's mega-listing on both Hong Kong and Shanghai stock exchange (Brean, 2007; Pogson, 2007). In the wake of the mega-floats, seven JSCBs and three leading CCBs also have accomplished their listing objective by the end of 2007. However, the state maintains the dominance as an absolute controlling shareholder.

In the mean time, a consistent process of the reform coupled with the ownership changes also took place after China's WTO entry, particularly the liberalization of the business to foreign banks, and allowing diversifications into intermediary business beyond the traditional deposit and loan activities. The changing ownership nature and structures of the banking sector and the favourable economic condition in the recent decade have promoted the development of the commercial banks. We collect a sample of 80 Chinese commercial banks for the period from 2000 to 2008, and investigate the determinants of bank performance. Aggregate index measures of performance are constructed based on proxy variables that assess the quality of assets, capital adequacy, operating profitability, and liquidity. Potential determinants at bank level, industry level, and macroeconomic level are examined in the panel data models. This paper emphasizes these factors that are results of the banking sector reform and liberalization, contributes to the literature in a number of ways. The sample coverage of commercial banks in this paper is beyond what is used in the prior research. The scope of the analysis and the measurement of performance is both objective that base on the inner-structure of the individual variables and subjective that based on the framework popular in practical bank management. Such a perspective ensures that the empirical implications are valid for quantitative observations, as well as policy making and evaluation.

We find that city commercial banks out-perform the national banks which include state owned big four banks and joint-stock banks. Our evidence also suggests lower financial leverage, higher off-balance sheet activities, and larger size of the bank are associated with better performance. At industry level, concentration of the banking sector has allowed better performance due to less competitive environment. The liberalization of the banking business to foreign banks in 2003 has an encouraging effect on the banking sector, although the evidence is not statistically significant. At macroeconomic level, higher per capita GDP and lower unemployment has been significantly related to better bank performance.

The remainder of this paper is organized as follows: Section 2 reviews the related literature. Section 3 discusses the measurement of commercial bank performance. Section 4 present potential determinants of bank performance. Section 5 describes the sample data and model specifications. Empirical findings are presented in Section 6. Section 7 concludes the paper.

## **2. Literature Review**

According to Heffernan and Fu (2008), two separate approaches were commonly used to assess bank performance in the previous literature. The first one aims to estimate profit and cost X-efficiency frontiers such as data envelop analysis (DEA) or stochastic frontier analysis (SFA). Grigorian & Manole (2002) estimate indicators of commercial bank efficiency by applying DEA to bank-level data from a wide range of transition countries during 1990s. The positive effects of capitalization and market concentration on DEA indicators suggest that banking sectors with fewer large, well-capitalized banks are more likely to generate better efficiency. However, they indicate

that privatization of banks, beyond those involving a transfer of controlling share to foreign owners, does not result in statistically significant improvements in efficiency. Bonin, Wachtel & Hasan (2004) apply SFA to investigate the effect of ownership, especially majority foreign ownership, on bank performance in eleven European transition economies over 1996-2000. One of the outcomes shows that state-owned banks make fewer loans, collect fewer deposits, and have higher non-interest expenditures than banks with majority foreign ownership. Bayraktar and Yan (2004) also study the relationship between the efficiency of domestic banks and foreign bank entry in reform process with the emphasis on the banking sector of 30 countries for the period of 1995-2002. The results indicate that in the countries where their stock markets are liberalized at first, efficiency gains from foreign bank entry, in terms of lower profit and costs, are the highest. For the countries which liberalized their capital account first, the relationship between the performance indicators and the foreign bank share is weakest.

Another strand of the literature considers profitability as the key indicator of performance and investigates the determinants of banks' profit variables such as return on asset (ROA), return on equity (ROE) and net interest margin (NIM). With regard to emerging markets, Athanasoglou, Brissimis & Delis (2005) investigate effects of bank-specific, industry-related and macroeconomic variables on bank profitability by applying a GMM technique to a panel of Greek banks that covers the period 1985-2001. All bank-specific determinants such as capital, labour productivity growth and operating expense, affect bank profitability significantly. However, the estimated effect of size does not provide evidence of economies of scale in banking. Likewise, the ownership status of the banks is insignificant in explaining profitability, denoting that private banks do not in general make relatively higher profits. Also, effect of industry concentration on bank profitability was found

insignificant. Chirwa (2003) identifies a significantly positive long-term relationship between concentration and performance by looking at Malawi banks during 1970-1984. Naceur and Goaid (2005) study the determinants of commercial bank interest margin and profitability in Tunisia for the periods 1980-2000. The expected determinants include individual bank characteristics (including overhead, equity capital ratio, loan to total asset ratio, non-interest activities and size), macroeconomic indicators (GDP and inflation), and financial structure factors (banking sector size, stock market size and bank concentration). The positively influential determinants were found to be capital amount, the inflation, and development of stock market.

Athanasoglou, Delis and Staikouras (2006) examine both internal and external determinants of bank profitability of the south-eastern European banking industry over the period 1998-2002. Their findings show that with the exception of liquidity, all bank-specific determinants (including loan quality, capital, operating expense, bank size and foreign ownership) significantly affect bank profitability. Especially, the effect of concentration is positive. Nevertheless, a positive relationship between banking reform and profitability was not identified. Furthermore, Beckmann (2007) particularly analyses structural and cyclical determinants of banking profitability in 16 Western European countries over the period 1979-2003. Financial structure, higher diversification of bank income sources and business cycle effects display substantial impacts on bank profits.

With respect to the studies on commercial banks in China, Berger, Hasan & Zhou (2006) estimate the profit and cost efficiency frontiers to assess the efficiency of 38 Chinese commercial banks over 1994-2003 with different majority and minority ownership structures, and find out that there is a strong favourable efficiency effect from reforms that reduce the state ownership of banks in China

and increase the role of foreign ownership. Fu and Heffernan (2005) assess the impact of different ownership types and banking reform on X-efficiency of 14 key banks (1985-2002). It shows that JSCBs, on average, are more X-efficient than SOCBs. Yao et al (2007) use a panel data of 22 state-owned and non-state banks in China for the period 1995-2001. The results show that two factors have significant impacts on the level of efficiency: ownership characteristics and equity/asset ratio. On average, non-state banks outperform state banks by 8-18% depending on whether the output of banking is measured by the amount of loans or by profitability. Additionally, banks facing a hard budget constraint tend to be more efficient than those relying on substantial government capital injections in turn having a high equity/asset ratio.

Differ to the approach employed by the researchers above, Shih, Zhang and Liu (2007) uses the principal components analysis to compare Chinese bank performance among the Big Four, joint-stock, and city commercial banks using cross-section data for 2002. In the study, overall performance, liquidity management, credit risk management, and capital profitability were employed as four core measures of bank performance. In terms of overall performance and in credit risk management, mid-size national joint-stock banks perform considerably better than the Big Four SOCBs and smaller city commercial banks (CCBs), but the size of the bank is not correlated with their performance. Lin and Zhang (2009) assess the effect of bank ownership on performance by using a panel of Chinese banks over the period 1997–2004. The Big Four SOCBs are found to be less profitable, are less efficient, and have worse asset quality than other types of banks. The banks undergoing a foreign acquisition or public listing demonstrate better pre-event performance, but there is little performance improvement in either the short-term or the long-term. Furthermore, bank size, foreign acquisition, or listing have little impact on ROA, ROE, the cost to income ratio and



non-performing loans to total assets.

Fu and Heffernan (2008) examine the improvement in bank efficiency in the reform by studying the performance of 76 banks between 1999 and 2006 in China. The standard financial ratios denoting recent reforms (such as listing, bank type, the extent of foreign ownership) and macroeconomic variables are employed as independent variables. Their impacts on the measures of profitability, namely Economic Value Added (EVA), ROE, ROA and NIM, are assessed respectively. Among the financial ratios, bank type is influential to profitability, but bank size is not. As two main indicators of reform, neither the percentage of foreign ownership nor bank listings has a discernable effect. Off-balance-sheet activities are also insignificant in improve the performance, perhaps because Chinese banks still focused on traditional bank services. Moreover, macroeconomic factors such as real GDP growth rates and unemployment also have significant effects on bank performance.

### **3. Bank Performance Measures**

Credit agencies, researchers, and bank regulators tend to evaluate banks' performance on the basis of a formal approach called CAMELS bank assessment system. According to Cousin (2007), CAMELS system mainly comprises six performance measures: capital adequacy, asset quality, management administration, profitability, liquidity and sensitivity to market risk. The China Banking Regulatory Commission (CBRC) also set out seven performance indicators in the pilot shareholding reform of the BOC and CCB to address banks' credit risk, market risk, operational risk and liquidity risk, which include ROA, ROE, the cost/income ratio, non-performing asset ratio, capital adequacy ratio and non-performing loan provision coverage ratio (Brean, 2007). In February

2004, CBRC published a rating system for assessing commercial banks excluding SOCBs, which is similar to CAMLES system (Cousin, 2007). Therefore, the novel feature of this study is going to follow the similar approach of CAMELS and use capital adequacy, asset quality, profitability and liquidity as core measures to capture a bank's comprehensive performance. Several financial variables will be selected to proxy the four dimensions

### **3.1 Asset Quality**

Bank assets are mainly constituted by loans, investment securities and non-interest cash and due from banks (Zhong, 2007). Loans dominate assets at most banks and generate the largest share of operating income. Bad asset quality can impair bank profitability by reducing interest income and by increasing provisioning costs (Ioannidis, Pasiouras & Zopounidis, 2009). In this regard, the bank's experience of loan loss, provisions/write off, loan recovery rate, ability to reduce non-performing assets and extent of weak assets can be analyzed to assess bank's asset quality (Brickwork, 2009). Among these indicators, loan loss reserve/gross loans ratio and loan loss provisions/net interest revenue ratio are frequently used a measure of asset quality. This is because loan loss provisions depend on the probability of loans becoming non-performing and they express the amounts of non-cash expense set aside from earnings to adjust for the potential decline in the value of the bank's loan assets, higher provisions indicate high probability of non-performing ratios and lower asset quality (Ioannidis, Pasiouras & Zopounidis, 2009). On the other hand, these ratios signal a bank's ability to timely recognize and fully prepare for the potential default or loss of loans.

Chinese banks have been featured by their poor asset quality. In 2003, they had the average NPL

ratio at 20%, compared to 3.1% for EU banks in the same year. The underlying reasons for such poor asset quality may be the soft-budget constraints for the lending to SOEs as well as a weak credit culture. However, Chinese banks have long been giving insufficient provision to the huge amount of NPLs. The provisioning percentage of Chinese banks was well below international standards (García-Herrero, Gavilá & Santabárbara, 2005). Through years of reforming, the overall provisioning in Chinese banks is growing, with SOCBs having most dramatic improvement in the ratio of loan loss reserve/gross loans, although a large part were the result of government recapitalization program.

### **3.2 Capital Adequacy**

Capital Adequacy is a measure of a bank's financial strength, in terms of its ability to withstand operational and abnormal losses. Adequate bank capital can function to reduce bank risk by acting as a buffer against loan losses, providing ready access to financial markets in turn to guards against liquidity problem and limiting risk taking but also constraining growth (Zhong, 2007).

In China, with the establishment of the CBRC in 2003, the 8% minimum capital adequacy ratio, defined in Basel I terms, was formally introduced. However, the capital adequacy ratio for most banks was below regulatory requirements at that time. According to Luo (2003), in 2003, the capital adequacy ratio of SOCBs is merely 4.61%, and the ratios for JSCBs and CCBs are 6.83% and 6.01% respectively. Moreover, the capital charge for credit risk is less than what is required in the Basel Accord I, because the existing capital rules have favourable risk weights for loan secured by physical collateral and guaranteed by other third parties. As the capital adequacy ratio is

determined by the capital base and risk-adjusted assets, banks can improve the ratio either by increasing the capital base or by diversifying the asset (Bao & Yin, 2005). Thus capital adequacy ratio is expected to be affected by the factors such as listing and diversification.

### **3.3 Profitability**

Profitability is an indicator of a bank's operating performance. In fact, banks' profitability should mirror the quality of their management and shareholders' behaviour as well as their competitive strategies, efficiency and risk management capabilities (García-Herrero, Gaviáb & Santabárbara, 2009). In the literature, bank profitability, typically measured by ROA and/or ROE, is usually expressed as a function of internal and external determinants (Athanasoglou, Delis & Staikouras, 2006). ROA is explained as a good overall indicator of a banking organization's performance that illustrates the ability of a bank to generate profits from the assets at its disposal, although it has a problem of not accounting for the profits generated from the off-balance-sheet operations (Ayadi & Pujals, 2005; Athanasoglou, Brissimis & Delis, 2005). ROE is as an alternative measure of profitability designed to reflect the return to owners' investment. It is often referred to as the bank's equity multiplier measuring financial leverage (Athanasoglou, Brissimis & Delis, 2005). However, ROE has also a disadvantage that the denominator may vary substantially across banks even those of identical size. This is due to the discretionary choices by management as to the mix between equity and debt as well as the total amount of capital held by a firm (Ayadi and Pujals, 2005). Moreover, since an analysis of ROE disregards the greater risks associated with high leverage and financial leverage is often determined by regulation, ROA emerges as the key ratio for the evaluation of bank profitability (Athanasoglou, Brissimis & Delis, 2005). Alternatively, net interest

margin (NIM) is also an indicator of banks' operating performance, which focuses on the profitability of those earning assets or interest activities. The higher the ratio, the cheaper the funding or the higher the margin the bank is obtaining. However, in the West, NIM is usually dismissed as too narrow a measure because of the expansion into off-balance-sheet (OBS) activities (Heffernan & Fu, 2008).

In China, the total banking sector pre-tax profit in 2006 was RMB 337.9 billion, of which RMB 240.9 billion was generated by major commercial banks. In 2003, the return on average equity (ROAE) of the banking system was 3.05% the return on average assets (ROAA) was 0.14%, well below international standards. On the other hand EU banks had 9.87% ROAE and 0.41% ROAA in the same year (García-Herrero, Gavilá & Santabábara, 2005). The underlying reason for the low profitability can be explained by the much larger amounts of provisions and write-offs, stemming from the very low asset quality.

### **3.4 Liquidity**

A liquidity problem usually arises from the possible inability of a bank to accommodate decreases in liabilities or to fund increases on the assets' side of the balance sheet (Athanasoglou, Delis & Staikouras 2006), such as unanticipated deposit withdrawals, which in turn affects profitability. Historically, banks and regulator monitored loan-to-deposit ratios as a general measure of liquidity. As a bank's earning assets, loans are presumably the least liquid of assets. And deposits are the primary sources of funds. Therefore, a high ratio indicates illiquidity. Alternatively, the liquidity ratio, defined as liquid assets to total deposits, conveys whether net liquidity sources are available

from assets. According to Alger and Alger (1999), liquid assets include adding up securities, dues from depository institutions and cash. The higher this ratio is, the stronger is a position of a bank to absorb liquidity shocks (Ayadi and Pujals, 2005). However, since liquid assets tend to be low yielding, a higher ratio implies lower earnings. In addition to this, the ratio of loan to asset and the ratio of liquid asset to total assets are also the commonly employed proxies for liquidity (Athanasoglou, Delis & Staikouras 2006). In this paper, the ratio of net loan to total asset will be employed to reflect the liquidity on the asset side, and the ratio of liquid assets to deposits plus short-term funding will be used to measure how a bank matches asset and liability to cope with potential liquidity problem.

In the case of China's banking sector, liquidity problem seem to be not as severe as other performance problems. This is not only due to the high saving rate (30% of GDP), but also because household customers are confident to deposit at these banks always with state aid (Fu & Heffernan, 2005). Moreover, Zhong (2007) also states that during the years that deposit rates were regulated, deposits were relatively stable and liquidity was less of a problem.

#### **4. Potential Determinants of Bank Performance**

This paper focuses on the several bank-specific factors that would significantly affect bank performance during the latest reforming years, which include bank type, listing of bank shares, bank size, capital structure and off-balance-sheet activities. These indicators do not only represent banks' characteristics, but also reflect banks' changes in the reform progress. Additionally, in order to isolate the effects of bank's characteristics on performance, industry-level factors and

macroeconomic factors are employed so as to control the influences of external factors.

#### **4.1 Bank Characteristics**

##### **Bank Type**

In principal, Chinese commercial banks can be classified into five categories: state-owned commercial banks (SOCBs), national joint-stock commercial banks (JSCBs), city commercial banks (CCBs), rural commercial banks (RCBs) and foreign banks (FBs). Bank type is expected to influence performance because banks are subject to different degree of political intervention and government influence. Regarding to Chinese banks, various studies show that the JSCBs do better than SOCBs and CCBs overall (Chen and Shin, 2004; Cousin, 2007; Shih, Zhang & Liu, 2007; Yao et al, 2007; Sun and Chen, 2008). The negative impact of SOCB's bank type on performance can be expected. SOCBs have objectives such as social stability and regional development different than profitability, so that they commit government obligations, namely policy lending, for SOEs that represent the vast majority of the state bank's loan book and recurring non-performing loans (Chen & Shin, 2004). With the implicit protection from government, SOCBs are less prudent in underwriting and monitoring loans, which in turn affect the asset quality (Zhou and Wong, 2008).

For JSCBs, compared to state-owned banks, they are not subject to government interference, credit quota restriction and the requirement of making policy loans. Furthermore, they are most active in terms of importing Western management and accounting standard and inviting foreign banks as partner (Shih, Zhang & Liu, 2007). In terms of the CCBs, although they are joint-stock banks as

well, they do not perform nearly as well as the JSCBs based on the previous studies. This is because they are regulated by different local government so they have substantially regional divergence in their financial performance. Only the most competitive ones, located in large economic centres or in provincial capitals, will have a stronger market presence, better capital adequacy and lower NPL ratios (Cousin, 2007) and their performance can be comparable to those of the healthier JSCBs. Very few studies have given focus on the performance of rural commercials. According to Heffernan and Fu (2008), rural commercials can perform superiorly because local governments also have helped write off their NPLs. More importantly, they have enjoyed a relatively less competitive environment since SOCBs withdrawn outlets from rural areas.

## **Listing**

As a part of further reform, during 2005- 2006, three of the Big Four went public listing. Up to the end of 2007, there are 14 Chinese banks have been listed, including three SOCBs, eight JSCBs and three CCBs. Listing bank shares is believed to improve bank performance in two ways. Before listing, banks must effectively undergo the partial privatization, which may involve capital injection and disposal of NPLs. After listing, listed banks can achieve marginal improvement due to greater market scrutiny and more transparent disclosure (Shih, Zhang & Liu, 2007). The prediction is supported by Wang (2008), who finds that listing on the stock market makes banks more efficient by reducing NPL ratio, enhancing capital adequacy, improving profitability. This is also agreed by Luo (2003) that the publicly listed banks perform better among other Chinese banks in asset quality. Financing from publicly listed equity has become one of the most desirable ways to raise capital there by improve capital adequacy (Xue, 2007; Han, 2009). Tan (2003) also suggested that listing



can be used to supplement a bank's core capital effectively. Therefore, whether a bank's shares are listed may affect Chinese banks' capital adequacy. According to Peng (2008), most listed banks have reached the minimum capital adequacy ratio of the Basel Accord except Shenzhen Development Bank with the ratio of 3.88% up to 2007. Such significant improvement may be benefited from capital injection, shareholding system reform and listing jointly.

### **Bank Size**

Bank size is generally considered a relevant determinant of bank performance. However, there is no consensus on the direction of influence. On the one hand, a bank of a large size should reduce costs because it captures potential economies of scale or scope in the sector. On the other hand, large size can also imply more difficulties in managing large bank or it could be the consequence of over aggressive expansion. Hence, the empirical evidence is also mixed. In the case of China, a negative association between bank size and performance is found by Zhou and Wong (2008) that banks with large asset size and poor management quality tend to have narrower interest margins, which reflect the reality that large state-owned banks in China tend to have lower profitability. In contrast, Li and Zhang (2008) suggest that the size growth of the can be positively influential to its profit growth, at least for listed banks in China. However, Shih, Zhang & Liu (2007) find that in China, the size of financial institutions has little to do with their performance. This is because larger banks are those SOCBs associated with more government intervention (García-Herrero, Gaviláb & Santabárbara, 2009). JSCBs are under the purview of both central regulatory authorities and in many cases the financial market. Small-scale CCBs are subject to their regulatory environments at the local level. Therefore, the large banks display moderate performance, which may reflect a mix

of generous central subsidies and moral hazard due to their size (Shih, Zhang & Liu, 2007).

## **Capital Structure**

Corporate governance problems, agency costs, and capital structure issues are particularly important in the banking industry, because banks are by their very nature informationally opaque – holding private information on their loan customers and other credit counterparties (Berger & Bonaccorsi di Patti 2003). Additionally, compared with other non-financial institutions, banks have substantially higher leverage due to the large proportion of deposit (Inderst & Mueller, 2008). Majority of studies support the positive relationship between leverage level and bank performance (Berger and Bonaccorsi di Patti, 2003; Pratomo and Ismail, 2006; Hutchison and Cox, 2006; Athanasoglou, Brissimis & Delis, 2005). However, contrast evidence is also showed by researchers. First, based on the sample banks in some European countries, Abreu and Mendes (2002) report that banks with higher equity ratios face lower expected bankruptcy costs, in turn lower funding costs, and then they can translate this advantage into higher interest margins on assets. Wang & Zhu (2008) indicates that there is a negative relationship between a bank's leverage and its profitability, because internal financing is preferred when a bank needs funds due to its lower cost and less restriction. Sayilgan & Yildirim (2009) conclude that a high capital adequacy ratio positively affects profitability when financial situation of banks is perceived as risky and it negatively affects profitability in normal situations due to alternative cost of capital.

## **Off-balance-sheet Activities**

Off-balance-sheet activities refer to those transactions which do not constitute scheduled assets and liabilities on financial statement but produce non-interest income for banks. Such activities involve trading financial instruments and generating income from fees of financial services and loan sales. The main OBS activities of Chinese banks including providing financial services such as foreign exchange business, financial advisory service, agency business, cash card business, and safety deposit box business is limited in scale (Chen & Shin, 2004). The development of a bank's intermediate business is also predicted to be the potential factors impacting profit growth of banks (Li and Zhang, 2008). Under the Risk-Based Capital guidelines, banks are required to hold a portion of equity capital in reserve to meet contingent obligations in off-balance sheet items. Therefore, as Bao & Yin (2005) indicate, expansion into OBS activities can improve capital adequacy by diversifying risks and in turn decreasing risk-adjusted assets. Based on a sample of several listed banks, Fan (2007) found that low capital adequacy ratio of Chinese banks can partially be attributed to the lagged development of intermediate business.

## **4.2 Industry-Level Factors**

In November 2003, the CBRC started to implement new policies, which represent a liberalization of banking sector to foreign banks after China's WTO accession. The new policy permits foreign banks to provide RMB services to all kinds of Chinese enterprises in areas with open RMB business. Previously, these banks' RMB services were restricted to foreign-funded enterprises, foreigners and people from Hong Kong, Macao and Taiwan in cities with open RMB business. The new policy also encourages qualified international strategic investors to join the restructuring and reforming of China's banking and financial institutions on a voluntary and commercial basis.

The frequent industry-level factors in the literature include size of banking sector, bank concentration and relative size of stock market. Athanasoglou, Brissimis, and Delis (2005) show that the more concentrated the market, the greater is the profitability that the players can achieve from higher loan rates and lower deposit rates. The finding of Molyneux and Thornton (1992) on European banks is consistent with this traditional paradigm that bank concentration positively and significantly correlated with pre-tax return on assets. Alternatively, interest rate spreads are found to be narrower in concentrated banking industry (Fu & Heffernan, 2005; Naceur & Goaid, 2005). According to the evidence from a transition economy, concentration is less beneficial to the Tunisian commercial banks than competition (Naceur & Goaid, 2005).

#### **4.3 Macroeconomic Factors**

As the proxies for the cyclical behavior of the economy, macroeconomic factors were frequently taken into account in previous studies. First, real GDP growth rate is expected to have a positive impact on banks' performance. The greater demand for bank services can be accompanied with a lower risk of default on loans (Heffernan & Fu, 2008). Moreover, a stronger relationship between economic growth and bank profits can be achieved through increased lending and improvement in bank asset quality (Athanasoglou, Brissimis & Delis, 2005). Second, inflation rate measures the overall percentage increase in the consumer price index for all goods and services (Heffernan & Fu, 2008). There may be a positive association between inflation and bank profitability, because high inflation rates are generally associated with high loan interest rates, and thus high incomes (Naceur & Goaid, 2005). In contrast, if the People's Bank of China uses interest rates to target the rising

inflation, inflation could raise default rates (Heffernan & Fu, 2008). Also, if inflation is not anticipated and banks are failed to adjust their interest rates then there is a possibility that bank costs may increase faster than bank revenues (Naceur & Goaid, 2005). Both are predicted to negatively affect a bank's performance. Finally, Heffernan and Fu (2008) and Abreu and Mendes (2002) suggest that rising unemployment could reduce aggregate demand and increase the loan default rate, which in turn decline bank profitability. This is supported by the empirical result of Abreu and Mendes (2002) that unemployment rate was negatively signed in regressions with net interest margin, return on average assets and return on average equity.

## **5. Data and Methodology**

### **5.1 Sample Selection**

We use the data set compiled by Bankscope – Fitch's International Bank Database. At the time of collection, the original sample covers 170 banks for the period from 2000 to 2008. Firstly, only commercial banks were selected, thus policy banks, cooperative banks and investment banks are excluded. Furthermore, according to Bankscope, the majority employed local generally accepted accounting practices (GAAP), and only the joint ventures, foreign banks, and listed banks prepared additional financial statements based on International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS). Hence, all the data used for analysis came from the statements based on local GAAP. In addition, those banks with the statements less than three years were also excluded from the original sample. In total, we are left with 80 banks in the final sample, including the Big Four state banks (also classified as national joint-stock banks in the analysis), 13

national joint-stock commercial banks, 49 city commercial banks, 4 rural commercial banks and 10 foreign banks (See the list of sample bank in Appendix 1). The bank-specific determinants mainly come from Bankscope. Bank concentration ratios are available in the database of Thorsten Beck, Asli Demirgüç-Kunt and Ross Levine (2008). Macro economic data, including annual real GDP growth rate, per capita GDP, annual inflation rate and annual unemployment rate, come from the World Bank online database.

## 5.2 Performance Measures

Assets Quality:  $LLR_{it}$  loan loss reserve ratio or loan loss reserves/gross loans. ‘Loan Loss Reserve’ for loan impairment is the amount that reduces the recorded investment in a loan portfolio to the carrying amount on the balance sheet. The ratio estimates the portion of total loans that may prove to be bad loans and acts insurance reserves for potential problem loans.  $LLP_{it}$  loan loss provision/net interest revenue. It provides an indication of the extent to which the bank has made provisions to cover credit losses, and in turn to impair net interest revenue on the income statement. The higher the ratio, the larger is the amount of expected bad loans on the books, and the higher are the risks despite having been provisioned (Ayadi & Pujals, 2005). On the other hand, a higher ratio also indicates the improvement in asset quality management.

Capital Adequacy:  $TCR_{it}$  total asset ratio is computed as capital base divided by risk adjusted assets. Capital base is defined as the sum of eligible Tier 1 capital and eligible Tier 2 capital.  $ENL_{it}$  equity/net loan. This measures a bank’s ability to withstand loss from loan through its equity capital. Banks with high ENL ratios may be over-conservative in profitable investment opportunities.

Alternatively, a declining ratio may be a signal of capital adequacy problems.

Profitability:  $NIM_{it}$  net interest margin or net interest income divided by average earning assets. Earning Assets include investments as well as net loans and leases. NIM reflects the difference between interest income and interest expense. Expressed as a percentage of average earning assets, a higher NIM is generally considered more desirable by investors and analysts.  $ROAA_{it}$  return on average assets.  $ROAE_{it}$  return on average equity.

Liquidity:  $NLTA_{it}$  net loans/total assets, or the percentage of assets that comprise the loan portfolio. Net loans equal gross loans minus loan loss reserves, a higher ratio means the lower asset liquidity.  $LIQ_{it}$  liquid assets/deposits plus short-term funding. As a measure of liquidity, the ratio may reflect how well the funding sources match the funding uses.

Table 1 summarizes the nine performance measures we use. The pairwise correlations of these measures are reported in table 2. Loan loss provision and loan/assets ratio appear negatively related with other measures. Several negative signs elsewhere all show very small correlations and do not suggest a significant problem. To aggregate the information contained in the group of performance measures above, we apply principal component analysis and factor analysis to score the first principal component and the first factor as index measures. The principal component analysis is usually used to identify the inner structure of a group of variables, and the factor analysis is used for capturing the overall variations of a group of variables in order to reduce their number. Table 3 shows the loadings for each individual measures when scoring the first principal component P1 and P2, respectively from all nine individual measures and from the seven most available individual

measures. In general, the loadings are smaller on the loss reserve ratio and return on average equity, and roughly in the same region for the rest of the individual measures. The signs are mostly positive as expected, except that better performance is associated with smaller load loss provision and smaller loan/assets ratio. The first principal indices capture 44.8% and 34.3% of the variations in all the individual measures, and the first factor indices capture 73.6% and 69.1% of the variations.

### 5.3 The Model

The index measures (P1, P2, P3, P4) developed in the previous section are used as the dependent variables of to model the performance (PER) of selected banks.

$$PER_{it} = \alpha_i + \beta_P PD + \beta_N ND + \beta_C CD + \beta_F FD + \beta_L LD + \mu CS_{it} + \pi SIZE_{it} + \rho OBA_{it} + \sigma BC_t + \tau \text{Log}(PCGDP)_t + \phi GDPG_t + \omega Inf_t + \theta U_t + \varepsilon_{it}$$

The explanatory variables include: First, three dummy variables for the four type of the selected bank, ND (national joint-stock commercial banks, as well as the big four banks); CD (city commercial banks); FD (foreign banks). This leaves very small number of observations for rural bank when all three dummies equal to zero. Second, a dummy for listed banks LD. Third, bank characteristic variables: a proxy of bank capital structure *EL* (equity/liability). A higher *EL* indicates a lower level of leverage; *LOGTA*: logarithm of total assets as a measure of size; a proxy for off-balance-sheet (OBS) activities, *OIA* the ratio of other operating income to average assets, indicating how much the bank has diversified away from the traditional intermediary function. Fourth, industry level determinants, a dummy for banking liberalization in 2003 PD, and bank



concentration ratio BC. Fifth, a vector of macro control variables include: *PCGDP*: log of per capita GDP; *GDPG*: annual real GDP growth rate; *INF*: inflation rate; *U*: unemployment rate. Summary of the explanatory variables are reported in table 4. Also in the model, we have the constant  $\alpha$  and regression error  $\varepsilon$ .

## 6. Empirical Results

We now look at the regression results reported in table 5 and 6. The test statistics suggest the models are valid and R-squared (or overall R-squared in Random Effect models) shows that it explains majority part of the variation in the performance indices. In general, the indices P1 and P3 based on all nine individual measures seem identify more significant and convincing results, although the number of observations is less than the regressions with P2 and P4 which has dropped loan loss provision and total capital ratio. The general indications are consistent however, although the significance on a couple of explanatory variables is affected. In addition, pooled OLS coefficients and random effect coefficients appear to have the same signs and are very similar in their magnitude of impact on the performance measures.

The coefficients on the dummy variables CD shows that city banks significantly outperform other banks when performance is measure using the first principal component. Although this significance is not shown against the first factor performance indices, they do not show contradictory evidence either. Foreign banks shows superior performance in one of the regressions (P4, OLS), but this is not at all robust in other regressions, not even the signs. There is some indication that national banks may slightly underperform other bank types, but no significance is found. This is different

with various studies that show the JSCBs do better than SOCBs and CCBs overall (Chen and Shin, 2004; Cousin, 2007; Shih, Zhang & Liu, 2007; Yao et al, 2007; Sun and Chen, 2008). The coefficients on the policy liberalization dummy here may provide very important information for the entire banking sector. While the policy change has allowed foreign bank competitions, it has been promoting better performance of commercial banks in China. The coefficient signs are consistently positive attached on relatively significant numbers, although the exact magnitude is not clear with non-standardized regressions. Given that the sample only covers three years prior to the policy change and six years after the change, this is fairly encouraging. The last dummy variable LD looks at the effect of listing, and the general evidence here suggest listing has a positive effect on the performance of banks, and in one of the regressions this is highly significant. This seems to provide some evidence that support the assertion by Xue (2007), Han (2009) and Peng (2008) that listing can significantly improve the capital adequacy, as well as with findings of Shih, Zhang and Liu (2007) and Wong (2008) that listing makes banks more efficient in improving profit. On the other hand, as Heffernan & Fu (2008) suggest, state subsidies are tailed off after bank shares are listed, and this may have an effect towards the other direction. However, as Lin and Zhang (2006) indicate, some banks might perform better only before being listed not subsequently, because large capital infusion was received to move off NPLs prior to listing but tailed off post listing.

Apart from the dummy variables, all three bank level determinants appear to be significant. The capital structure equity-to-liability ratio is consistently positive and significant across eight regressions. This is consistent with the report of Abreu and Mendes (2002) that banks with higher equity ratio tend to be more profitable because they face less bankruptcy costs. Another likely explanation for this can be linked to the study of Sayilgan & Yildirim (2009) that high equity capital

ratio can positively affect profitability when the bank is perceived as less risky. In addition, well capitalized banks are also better protected from unexpected losses in their deposit and loan mismatches, therefore should have better capital adequacy and liquidity. Profit from off balance sheet activities seem to have a positive and significant effect on the overall performance measures, obviously by increasing fee-based income in Chinese banks. This is in accordance with Zhong (2007) and Li and Zhang (2008), who claim that OBS activities can be positively related to bank earning ability and profit growth. Moreover, the significance is not always robust, and may reflect the fact that the progress of moving into OBS activities has been relatively slow to date, thus it is not an important factor toward performance yet. However, Heffernan & Fu (2008) also find that interest margins will fall when banks diversify into a wider range of OBS activity. They explain it as that other operating income over assets seems to be less reliable proxy for banks' operational performance in the case of Chinese banks engaging in a wider range of OBS activity. Size seems to be significantly positive factor in regressions with performance indices based on all nine individual measures. However, this is not the case for the random effects results with P4, where we see a negative and significant sign. Zhou and Wong (2008) also suggest that banks with large asset size and poor management quality tend to have narrower interest margins. The overall result is non-conclusive and somewhat in line with the conclusion by Berger et al. (2008) and Yao et al. (2007) that size has little to do with performance in Chinese banks because larger Chinese banks are mainly constituted by those relatively less profitable state owned banks.

The industry and macroeconomic level control variables exhibit signs and coefficients mostly as expected. Bank concentration is in most regressions a positive and highly significant factor. This supports the argument by Molyneux and Thornton (1992) and Athanasoglou, Brissimis, and Delis

(2005), which assert that the more concentrated the market, the greater is the profitability that the players can achieve from higher loan rates and lower deposit rates. Performance of the commercial banks is positively related to higher GDP growth rates and highly significantly positive to per capita GDP, representing an increased demand for banking business in good macroeconomic conditions. Higher inflation has shown a negative partial effect on the performance. Unemployment seems to have the most influential and significantly negative effect on the bank performance indices. Such results are consistent with much of the previous studies (Heffernan & Fu, 2008; Naceur & Goaid, 2005; Abreu and Mendes, 2002).

## **7. Conclusion**

The Chinese banking sector has gone through a consistent process of the reform which initiated in 2001 after China's WTO entry, includes liberalization of the business to foreign banks, ownership structure changes through privatization and listing bank shares, allowing diversifications into intermediary business beyond the traditional deposit and loan activities. This paper aims to analyse the effect of such reforms and examine bank level, industry level, and macroeconomic level determinants of the performance of the Chinese commercial banks. Our approach incorporates aggregate index measures of bank performance following the typical evaluations systems utilized by the state regulatory agency and much of the international banking industry. The statistics reported on our index measure and the individual measures enable us to relate our results to the existing literature using individual measures. They are also useful when drawing policy implications for both business management and regulatory supervision.

In general, our results are fairly robust with OLS and Random-effects panel data models. Our evidence suggests city banks outperform other types of banks, and foreign banks performed quite well. National banks including the Big Four may under-performed other banks in the sample period, but this is not statistically significant. There is some indication that the liberalization of the banking business to foreign banks has led to better performance of the commercial banks, although this is not significant, probably due to the short history examined. Listing has significantly promoted better performance of the banks. At bank level, larger size, lower financial leverage, and more significant off-balance sheet activities are associated with better overall performance. Industry level control variable suggest that a more concentrated banking sector is related to significantly better commercial bank performance due to less competition. Macroeconomic control variables show that banks perform better when GDP growth rate and per capita GDP is higher, and when inflation and unemployment is lower. These results are consistent with our expectation and much of the literature reviewed in earlier sections. This round of banking sector reforms is still evolving and much more changes are to be expected, perhaps a longer record of historical data in the future can provide us with more convincing and statistically significant results in our favour.

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**Table 1: Bank Performance Measures**

Performance Measures	Mean	Std. Dev.	Min	Max
Loan loss reserve/Gross loans	2.35	2.30	0.00	22.02
Loan loss provision/Net interest revenue	21.33	20.51	-152.56	163.16
Total capital ratio (%)	14.34	31.21	-1.50	380.80
Equity/Net loans (%)	18.03	50.53	-26.86	713.95
Net interest margin (%)	2.60	0.94	0.42	6.68
Return on average assets (%)	0.69	0.64	-1.39	8.58
Return on average equity (%)	12.25	14.30	-193.90	82.35
Net loan/Total assets (%)	53.69	10.97	9.08	88.15
Liquid assets/deposit & short-term funding (%)	27.10	39.23	5.41	671.43

**Table 2: Pairwise Correlations of The Performance Measures**

	LLR	LLP	TCR	ENL	NIM	ROAA	ROAE	NLTA	LIQ
LLR	1								
LLP	0.064	1							
TCR	-0.034	-0.419	1						
ENL	0.035	-0.412	0.976	1					
NIM	0.124	-0.129	0.197	0.167	1				
ROAA	-0.049	-0.506	0.667	0.569	0.35	1			
ROAE	-0.086	-0.093	-0.042	-0.08	0.132	0.292	1		
NLTA	-0.112	-0.032	-0.475	-0.36	0.271	-0.156	-0.068	1	
LIQ	0.262	-0.304	0.89	0.754	0.132	0.307	-0.058	-0.349	1

**Table 3: Bank Performance Indices**

Performance Measures	P1	P2	P3	P4
Loan loss reserve/Gross loans	0.0335	0.1371	0.0149	0.0645
Loan loss provision/Net interest revenue	-0.2877		-0.0287	
Total capital ratio (%)	0.4718		0.3719	
Equity/Net loans (%)	0.4717	0.5849	0.3690	0.5930
Net interest margin (%)	0.1434	0.2128	0.0027	0.0449
Return on average assets (%)	0.4140	0.4539	0.1916	0.1579
Return on average equity (%)	0.0435	0.0604	0.0460	0.0693
Net loan/Total assets (%)	-0.2787	-0.3117	-0.0097	-0.0458
Liquid assets/deposit & short-term funding (%)	0.4473	0.5356	0.1011	0.2514
Proportion (%)	44.8	34.3	73.6	69.1
Number of Obs.	303	459	303	459

**Table 4: Explanatory Variables**

Variables	Mean	Std. Dev.	Min	Max
Equity/Liability (%)	12.49	41.40	-12.06	682.96
Log(total assets)	4.68	0.88	2.76	6.94
Other operating income/Average assets (%)	0.43	0.49	-3.36	4.00
Bank concentration (%)	0.67	0.05	0.59	0.77
Log(per capita GDP)	4.14	0.14	3.90	4.36
GDP growth rate	10.38	1.47	8.30	13.00
Inflation	2.37	2.02	-0.77	5.86
Unemployment	4.04	0.29	3.10	4.30

**Table 5: Determinants of Bank Performance**

First Principal Component Index	P1	P1	P2	P2
Method	OLS	RE	OLS	RE
Liberalization Policy	0.381 (0.89)	0.328 (0.86)	0.212 (0.63)	0.201 (0.80)
National Bank	-0.114 (-0.52)	-0.115 (-0.39)	-0.275 (-1.24)	0.137 (0.38)
City Bank	0.422*** (2.72)	0.396** (2.16)	-0.022 (-0.12)	-0.163 (-0.67)
Foreign Bank	-0.193 (-0.59)	-0.158 (-0.33)	0.360 (1.26)	-0.322 (-0.86)
Listed Bank	0.119 (1.18)	-0.054 (-0.42)	0.153* (1.89)	-0.053 (-0.46)
Equity/Liability	0.117*** (8.48)	0.113*** (5.50)	0.023*** (5.74)	0.026*** (6.40)
Log(Total assets)	0.276*** (2.70)	0.261 (1.53)	0.008 (0.11)	-0.320* (-1.77)
Other operating income/Average assets (%)	0.360** (1.95)	0.409* (1.83)	0.070 (0.40)	0.125 (0.63)
Bank concentration (%)	4.764** (2.23)	4.960** (2.52)	2.406 (1.01)	2.905** (1.98)
Log(per capita GDP)	1.757** (2.11)	1.993** (2.38)	3.091*** (3.99)	3.911*** (6.55)
GDP growth rate	0.068 (1.15)	0.070 (1.34)	-0.009 (-0.15)	0.012 (0.36)
Inflation	-0.061 (-1.06)	-0.063 (-1.13)	-0.042 (-0.69)	-0.052 (-1.35)
Unemployment	-0.479 (-1.16)	-0.498 (-1.33)	-0.740*** (-2.88)	-0.508*** (-2.88)
Constant	-12.024*** (-2.65)	-12.917*** (-2.94)	-11.730*** (-2.92)	-15.086*** (-5.69)
Obs.	303	303	459	459
F-stat	15.79***		16.83***	
Wald chi2(8)		166.58***		413.64***
R-squared	83.04	83.49	51.40	49.33

\*Indicates 10% significance, \*\* 5%, and \*\*\*1% significance.

**Table 6: Determinants of Bank Performance**

First Factor Index	P3	P3	P4	P4
Method	OLS	RE	OLS	RE
Liberalization Policy	0.152 (0.76)	0.143 (0.76)	0.138 (0.69)	0.125 (0.81)
National Bank	-0.030 (-0.34)	-0.027 (-0.27)	-0.049 (-0.46)	0.160 (0.92)
City Bank	0.113** (2.02)	0.106** (1.95)	-0.041 (-0.51)	-0.111 (-1.01)
Foreign Bank	-0.130 (-0.91)	-0.098 (-0.59)	0.313** (2.15)	-0.015 (-0.08)
Listed Bank	0.058 (1.35)	0.016 (0.34)	0.079** (2.24)	-0.027 (-0.52)
Equity/Liability	0.059*** (8.29)	0.058*** (6.93)	0.014*** (5.36)	0.015*** (5.67)
Log(Total assets)	0.104** (2.37)	0.100** (1.96)	-0.047 (-1.31)	-0.202** (-2.23)
Other operating income/Average assets (%)	0.225*** (2.72)	0.242*** (2.65)	0.066 (0.62)	0.114 (0.88)
Bank concentration (%)	1.767* (1.87)	1.798** (1.95)	0.816 (0.58)	1.000 (1.04)
Log(per capita GDP)	0.662* (1.74)	0.704** (1.98)	1.336*** (3.03)	1.722*** (4.77)
GDP growth rate	0.024 (0.95)	0.025 (1.00)	-0.014 (-0.42)	-0.003 (-0.20)
Inflation	-0.034 (-1.28)	-0.034 (-1.30)	-0.024 (-0.69)	-0.028 (-1.19)
Unemployment	-0.036 (-0.17)	-0.042 (-0.21)	-0.325** (-2.45)	-0.210** (-2.35)
Constant	-5.195** (-2.42)	-5.333*** (-2.5)	-4.667** (-2.15)	-6.247*** (-4.08)
Obs.	303	303	459	459
F-stat	11.65***		12.99***	
Wald chi2(8)		127.43***		290.16***
R-squared	87.00	86.96	54.14	52.73

\*Indicates 10% significance, \*\* 5%, and \*\*\*1% significance.

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**Appendix 1: Selected Banks**

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1	Agricultural Bank of China	41	Evergrowing Bank Co Ltd
2	Allied Commercial Bank	42	First Sino Bank
3	Bank International Ningbo	43	Fudian Bank Co Ltd
4	Bank of Beijing Co Ltd	44	Fuzhou City Commercial Bank
5	Bank of Chengdu Co Ltd	45	Guangdong Development Bank
6	Bank of China Limited	46	Hankou Bank
7	Bank of Chongqing	47	Harbin Bank
8	Bank of Communications Co. Ltd	48	Hua Xia Bank
9	Bank of Dalian	49	Huishang Bank
10	Bank of East Asia (China) Ltd	50	Huzhou City Commercial Bank
11	Bank of Hangzhou Co Ltd	51	Industrial & Commercial Bank of China (ICBC)
12	Bank of Jiangsu Co Ltd	52	Industrial Bank Co Ltd
13	Bank of Jinzhou Co Ltd	53	Jiujiang City Commercial Bank Co Ltd
14	Bank of Nanjing	54	Karamay City Commercial Bank Co Ltd
15	Bank of Ningbo	55	Kunshan Rural Commercial Bank
16	Bank of Ningxia Co Ltd	56	Laishang Bank Co Ltd
17	Bank of Qingdao Co Ltd	57	Lanzhou City Commercial Bank Co Ltd
18	Bank of Rizhao	58	Linshang Bank Co Ltd
19	Bank of Shanghai	59	Liuzhou City Commercial Bank
20	Bank of Tianjin	60	Nanchang City Commercial Bank
21	Bank of Wenzhou Co Ltd	61	Panzhuhua City Commercial Bank Co Ltd
22	Baoshang Bank	62	Ping An Bank Co Ltd
23	Beijing Rural Commercial Bank Co Ltd	63	Qilu Bank co ltd
24	BNP Paribas (China)	64	Qishang Bank
25	Cangzhou City Commercial Bank	65	Shanghai Pudong Development Bank
26	Changsha City Commercial Bank Co., Ltd	66	Shanghai Rural Commercial Bank
27	Changzhi City Commercial Bank	67	Shaoxing City Commercial Bank Co Ltd
28	Chengde City Commercial Bank Co Ltd	68	Shenzhen Development Bank Co., Ltd
29	China Bohai Bank	69	Shenzhen Rural Commercial Bank Co Ltd
30	China CITIC Bank Corporation Limited	70	Shijiazhuang City Commercial Bank
31	China Construction Bank Corporation	71	Shinhan Bank (China) Limited
32	China Everbright Bank Co Ltd	72	United Commercial Bank (China) Ltd
33	China Merchants Bank Co Ltd	73	United Overseas Bank (China) Limited
34	China Minsheng Banking Corporation	74	Xi'an City Commercial Bank
35	China Zheshang Bank Co Ltd	75	Xiamen City Commercial Bank
36	Commercial Bank Co Ltd of Luoyang	76	Xiamen International Bank
37	Commercial Bank of Zhengzhou	77	Xinxiang City Commercial Bank
38	Deyang City Commercial Bank	78	Yantai Bank Co Ltd
39	Dongguan City Commercial Bank Co Ltd	79	Yingkou City Commercial Bank
40	Dongying City Commercial Bank	80	Zhejiang Chouzhou Commercial Bank

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