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Corporate Governance and Bank Performance in China[Ⓞ]

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Abstract: This paper examines the effects of corporate governance on bank performance in China over the period 1995-2008. Bank performance has improved significantly and the mean profit efficiency level is estimated at 61 per cent. The results suggest that differences in corporate governance have significant impacts on bank performance: banks with majority foreign ownership are most profitable while banks with majority state ownership are most unprofitable. We find no evidence that foreign minority ownership in domestic banks improves performance. Banks with more dispersed ownership are found to be more profit efficient.

Key words: SFA; Chinese Banking; Corporate governance.

JEL: C23, G21, G32

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1. Introduction

Although the concept of corporate governance is relevant to all firms in all countries, it has no globally accepted single definition. A generally agreed definition is “the system by which firms are directed and controlled,” considering both internal governance elements based on agency theory and external control elements on the grounds of stakeholder theory. When there is a separation between the control of firms and ownership, agency problems occur—firm management (agents) in charge of day to day operations of the firm may not act in the best interests of the firm’s owners (principals) (Bearle and Means, 1932). To solve agency problems, some researchers (Alchian, 1950; Jensen, 1988) argue that product market competition pressurizes managers to act with self-discipline; while Jensen (1993) suggests enhancing the roles of directorial boards and large shareholders. Stakeholder theory addresses not only the relationship between the firm and its owners, but also a wide range of other stakeholders, such as employees, customers, creditors, and government (Maher and Andersson, 1999). Gillan (2006) develops a broader framework of corporate governance in terms of internal governance and external governance. Internal governance is made up of five aspects—the role, structure and incentives of the Board of Directors; managerial incentives; capital structure; bylaws and charter provision and internal control systems. External governance also covers five dimensions—laws and regulations; markets for capital, corporate control, labour, and product; capital market information provision; external accounting, financial and legal services, and private sources of external oversight (i.e. the media and external lawsuits).

The effectiveness of corporate governance is largely determined by ownership structure and it, in turn, affects performance. The connection between corporate governance, ownership structure, and performance has been the subject of a long and ongoing debate in the economics and corporate finance literature. In the banking industry, the issue of corporate governance becomes more complicated than in other industries due to a number of factors, including the level and quality of bank regulation and supervision, the opaque nature of banks assets, the state of market development and the institutional environment (Levine, 2004).

In the corporate finance literature, a firm's performance is usually measured using accounting-based profitability measures (e.g. ROA and ROE), market-based ratios (e.g. total shareholder return, price-earnings ratio, and dividend yield) and cash flow-based measures (e.g. free cash flow, cash flow per share). These measures are subject to limitations as accounting data can be easily manipulated and share prices are affected by many factors. Efficiency is considered a more sophisticated measure of performance since it is derived from firms' inputs and outputs. In the bank efficiency literature, corporate governance is mainly examined under the framework of ownership and performance. The primary concern is to find the optimal ownership and management structure which can better solve the principal-agent problem (Spong *et al.* 1995).

Ownership structure has two dimensions: the degree of ownership concentration and the nature of the owners (Iannotta et al., 2007). As to the effect of ownership concentration on performance, there are different opinions. Jensen and Meckling (1976) argue that as managers' equity share decreases and ownership becomes more dispersed, agency costs

associated with a deviation from value maximization increase. In contrast, Fama (1980) suggests that although listed firms tend to have a low degree of ownership concentration, an efficient capital market is likely to discipline the firm's management. In fact, listed banks under capital market discipline and monitoring are empirically found to be more efficient than unlisted ones (Berger and Mester, 1997). Moreover, large shareholders may benefit from their control over management at the expense of minority shareholders' interests. In such a case, minority shareholders' interests should be protected by the legal system to maintain their confidence (OECD, 2004). Ianotta et al. (2007) find ownership concentration has no significant effects on banks' profitability but is associated with better loan quality and lower asset and insolvency risks.

Firms with the same degree of concentration but a different nature of owners may perform differently from one another. State ownership theoretically means all citizens are co-owners who in practice have no power and no incentive to influence and monitor the management of state firms, leaving government as the only effective representative agent (Huibers 2005). Governments, however, have multiple (often conflicting) goals other than profit maximization. These state-owned firms are run by bureaucrats who "have extremely concentrated control rights but no significant cash flow right" (Shleifer and Vishny, 1997). Meanwhile, there exists a lack of market discipline in inefficient state firms (they are less likely to go bankrupt) and inadequate means of punishing managing bureaucrats for wrong-doings. In contrast, private ownership is expected to reduce agency problems and improve performance based on the property rights literature (Alchian, 1965). Shareholders exercise due diligence and monitor management performance. The management of private banks face a pressure to improve

performance as inefficient management can be replaced and banks may go bankrupt when facing financial distress. In the banking industry, state ownership has been prevalent in both developed and developing countries in the past based on the argument that governments have been able to channel funds into sectors and projects with low financial but high social returns. However, empirical research generally reports that state-owned banks underperform their private counterparts (Bonin *et al.*, 2005a; Fries and Taci, 2005; Iannotta *et al.*, 2007; and Yao *et al.*, 2007).

Foreign ownership comes in two forms: foreign majority ownership (foreign banks) and foreign minority ownership in domestic banks. There are two contrasting views on the performance of foreign banks. The home field advantage hypothesis argues that domestic banks are generally more efficient than foreign-owned institutions due to organizational diseconomies to operate and monitor from a distance and limited access to local soft qualitative information. The global advantage hypothesis argues that foreign institutions can be more efficient because of superior managerial skills and high quality human capital inherited from foreign owners (Berger *et al.* 2000). The home field advantage hypothesis tends to hold in developed countries while the global advantage hypothesis holds in developing countries (Claessens *et al.*, 2001). Foreign minority ownership in domestic banks is expected to have a positive performance effect by bringing in advanced technology, modern banking techniques and superior managerial skills. Empirical studies (i.e. Bonin *et al.*, 2005b, Berger *et al.*, 2009) suggest improvements in performance after foreign investment in domestic banks.

In China, the central government initiated gradual banking reform in the early 1980s. The reform was accelerated from 2003, focusing on optimizing bank ownership structure to improve corporate governance, strengthen internal control mechanisms and risk management systems. In fact, building up well-functioning corporate governance is the key to the success of Chinese banking reform. To safeguard achievements in ownership and corporate governance reforms, the China Banking Regulatory Commission (CBRC) set out ten requirements for good corporate governance benchmarking the top 100 largest banks globally. These requirements cover corporate governance structure, diversified ownership, the goal of profit maximization, prudent accounting practices, and market-oriented human resource management (www.cbrc.gov.cn). After more than three decades of reform, the ownership structure and corporate governance issue have become more relevant than ever before. It is of great interest to empirically examine the relationship between corporate governance and bank performance, thereby providing for policy makers evidence for formulating future reform strategy.

Despite the growing interests of researchers worldwide in the Chinese banking industry, there is little research on bank corporate governance, perhaps due to the lack of detailed data on standard corporate governance variables relating to Boards of Directors. Lin and Zhang (2009) examine the impact of bank ownership reform on bank performance (where bank performance is measured by simple accounting ratios) over the period 1997-2004. They find state ownership is associated with lower profitability and poorer asset quality. Jiang *et al.* (2009) investigate the effect of changes in corporate governance on bank technical efficiency and their findings are similar to Lin and Zhang

(2009) that state-owned banks are the least efficient banks. But, unlike Lin and Zhang (2009) who found no performance improvement after governance changes, Jiang *et al.* (2009) observed some favourable efficiency effects brought about by changes in corporate governance. The present study extends existing bank corporate governance literature by considering both ownership concentration and the nature of bank owners (including foreign majority and minority ownership), while controlling for bank risk taking characteristics in terms of credit risk, market risk, liquidity risk, and capital risk.

Employing a one-step SFA model, this paper examines the impact of corporate governance on bank profit efficiency for 47 banks in China over the period 1995-2008. Following literature (Berger *et al.*, 2005 and Williams and Nguyen, 2005), different ownership structures are employed to capture differences in corporate governance. We find that bank efficiency has improved significantly with a mean of 60 per cent. Examining the nature of owners, banks with majority foreign ownership are the most profitable while those with majority state ownership are the most unprofitable. Moreover, we find no evidence that foreign minority ownership improves bank efficiency. Looking into ownership concentration, banks with more dispersed ownership are found to be more efficient.

The rest of this paper is organized as follows. Section 2 briefly introduces the Chinese banking system and banking reform. Section 3 outlines research methods. Section 4 analyzes empirical results and section 5 concludes.

2. Brief history of Chinese banking system and its reform

In the late 1970s, the Chinese banking system entered into a reform period that aimed to create a multi-ownership, competitive and market-oriented banking system. This period can be sub-divided into four stages. The first stage was an initial institutional restructuring period during 1979-1984, beginning with the creation of a two-tier banking system. The People's Bank of China became the central bank and the commercial banking operations were taken over by four specialized state-owned banks (known as the "Big Four"): the Agricultural Bank of China (ABC) undertook rural banking business; the Industrial and Commercial Bank of China (ICBC, established in 1984) focused on commercial banking activities in urban areas; the People's Construction Bank of China (later renamed as China Construction Bank Corporation—CCBC) dealt with government fixed assets investment and urban large construction projects; and the Bank of China (BOC) conducted foreign currency transactions.

The subsequent reform was to deepen institutional restructuring during the 1985-1994 period. Foreign banks and domestic joint-stock banks were allowed to enter into the market, diversifying bank ownership structure. Most nationwide or regional joint stock commercial banks (JSCBs) were launched with shareholding ownership structures—an institutional breakthrough in banking industry. However, the "Big Four" still dominated the banking system and played a strong role in promoting economic growth and maintaining stability.

The third stage of banking reform was the commercialization of banks during 1995-2002. The year 1995 marked the beginning of bank commercialization when the Law of

the People's Republic of China on Commercial Banks was enacted. The "Big Four" were legally defined as state-owned commercial banks (SOCBs) and their policy lending functions were taken away by the three newly established policy banks.¹ However, these policy banks lacked branch networks and capital as well as serving and lending capacity and they were unable to meet the needs of policy lending functions which were previously performed by the "Big Four." Moreover, central and local governments frequently intervened in the operations of "Big Four," resulting in a huge number of NPLs. Meanwhile, the Chinese economy experienced overheating and the transitional reform of state-owned enterprises was deepened in the 1990s. NPLs grew even faster while bank capital adequacy ratios declined steadily. By 1999, SOCBs became financially insolvent and the banking system became rather vulnerable. Perhaps awakened by South East Asian Financial Crisis in 1997, the central government launched the first round of SOCBs bailouts in 1998-1999 to treat its ailing banking system. Despite a capital injection into SOCBs of RMB 270 billion in 1998 and an offloading of RMB 1.4 trillion of NPLs from the SOCBs, the reform did not address the corporate governance issue which were the root cause of problems in the Chinese banking system.

In the mid-1990s, City Commercial Banks (CCBs) were created by way of restructuring and consolidating former urban credit cooperatives. CCBs adopted a shareholding ownership structure and were restricted geographically within their own localities. Capital was provided by urban enterprises and local governments. CCBs mainly serve small and medium-sized enterprises, collectives and local residents in their

¹ Namely the China Development Bank, the Import-Export Bank of China, and the Agricultural Development Bank of China

municipalities. These CCBs flourished and were allowed case by case to expand into other regions since early this century.

In 2003, the central government initiated more radical banking reforms to modernize the banking system in response to China's WTO entry in 2001. Using the state's massive foreign exchange reserves, the government sequently injected capital to and tripped off NPLs from major commercial banks, including BOC, CCBC, Bank of Communication, ICBC, and ABC. After financial restructuring, these banks were partially privatised by attracting foreign investors and/or undergoing IPOs on the Shanghai and Hong Kong Stock Exchanges. Both foreign investors and the capital market reacted highly positively. Foreign investors have invested in all types of domestic banks (SOCB, JSCB and CCBs) and some listed banks' share prices rocketed by more than 100% in the capital market. Following ICBC becoming the largest bank in the world with a market capitalization of \$246 billion in July 2007, ABC became the world's largest first-time share sale with an IPO raising \$22.1 billion in July 2010. These reforms have resulted in significant changes in corporate governance in the banking industry.

Along with institutional and financial restructuring, a series of comprehensive and concrete reforms were implemented to liberalize the financial market and strengthen a prudent regulatory and supervisory framework. Actions have included the removal of credit quotas in 1998, the introduction of capital adequacy requirements, adoption of an internationally accepted five-category loan classification system, reduction in NPLs and so forth. By 'touching stones to cross the river,' banking reform has achieved considerable progresses. By 2009, a multi-layered banking system has taken shape,

comprising of a central bank of the PBC, a regulatory and supervisory body of the CBRC, four partially privatized SOCBs, 13 JSCBs, 112 CCBs, FBs, along with a vast number of other small financial institutions. The total banking assets and liabilities reached RMB 78 trillion and RMB 74 trillion, respectively (CBRC annual report, 2009).

3. Methodologies, model specification and data

The preferred estimation technique is SFA, developed by Aigner, Lovell, and Schmidt (1977). SFA pre-specifies a functional form and decomposes error terms into a random error (v_i) and inefficiency (u_i). It assumes that inefficiencies follow an asymmetrical half-normal distribution and random errors follow a symmetric standard normal distribution. The SFA is criticized for its pre-specified functional form and distributional assumptions. However, Fries and Taci (2005) suggest that the SFA that separates random errors and inefficiencies is more appropriate over the non-parametric method in transition and developing countries where problems of measurement errors and uncertain economic environments are more likely to prevail.

This paper adopts a one-step model proposed by Battese and Coelli (1995). It is assumed that non-negative inefficiencies are a function of firm-specific variables and they are independently distributed as truncations of normal distributions with constant variance but with means that are a linear function of observable variables. A commonly employed two-step procedure involves estimating a cost and/or profit frontier to derive inefficiencies in the first step and then to regresses the estimated inefficiencies against a set of possible determinants in the second step. This two-step procedure suffers from serious econometric problems. For instance, inefficiencies are assumed to be identically

distributed in the first step but they are assumed to have a functional relationship with a set of variables in the second stage (Kumbhakar and Lovell 2000).

This paper prefers an alternative profit efficiency measure for following reasons. First, profit efficiency is based on economic foundations accounting for not only the use of technology in the production process but also the production optimization for the given market prices and competition conditions (Berger and Mester, 1997). Second, an alternative profit frontier assumes that banks can exercise a degree of market power in setting output prices (Berger and Mester, 1997). Finally, profit efficiency is considered to be a better performance measure since cost efficiency can be biased if NPLs cannot be controlled for.

The Battese and Coelli (1995) model for estimating an alternative profit frontier is shown in Equation (1)

$$\ln y_{it} = \beta_0 + \beta_1 t + \beta x_{it} + \ln v_{it} - \ln u_{it} , \quad i=1, \dots, N; t=1, \dots, T, \quad (1)$$

where i and t denote firm and time; $\ln y_{it}$ is the logarithm of the profit of the i -th firm; x_{it} is a $k \times 1$ vector of the logarithm of input prices and output of the i -th firm; V_{it} a random variable assumed to be iid. $N(0, \sigma_v^2)$ and independent of U_{it} ; U_{it} are profit inefficiency, which are assumed to be independently distributed as truncations at zero of the $N(m_{it}, \sigma_u^2)$ distribution; β is a vector of unknown parameters to be estimated.

Equation (2) shows the inefficiency effects model

$$m_{it} = \delta_0 + \delta_1 t + \delta_2 x_{it} + W_{it} \quad (2)$$

where z_{it} is a vector of explanatory variables associated with profit inefficiency over time; W_{it} is a random variable defined by the truncation of the normal distribution with zero mean and variance σ^2 ; δ is a vector of unknown coefficients to be estimated.

The empirical specification of the alternative profit frontier in translog form is shown in Equation (3).

$$\begin{aligned}
\ln(\Pi_{it} / w_2 z_2) = & \alpha + \sum_{i=1}^3 \beta_i \ln(Y_i / z_2) + \sum_{k=1} \psi_k \ln(W_k / w_2) + \sum_{r=1} \phi_r \ln(Z_r / z_2) + \tau_1 T \\
& + \frac{1}{2} \sum_{i=1}^3 \sum_{j=1}^3 \beta_{ij} \ln(Y_i / z_2) \ln(Y_j / z_2) + \frac{1}{2} \sum_{k=1} \sum_{m=1} \psi_{km} \ln(W_k / w_2) \ln(W_m / w_2) \\
& + \frac{1}{2} \sum_{r=1} \sum_{s=1} \phi_{rs} \ln(Z_r / z_2) \ln(Z_s / z_2) + \frac{1}{2} \tau_{11} T^2 \\
& + \sum_{i=1}^3 \sum_{k=1} \varpi_{ik} \ln(Y_i / z_2) \ln(W_k / w_2) + \sum_{i=1}^3 \sum_{r=1} \kappa_{ir} \ln(Y_i / z_2) \ln(Z_r / z_2) \\
& + \sum_{k=1} \sum_{r=1} \sigma_{kr} \ln(W_k / w_2) \ln(Z_r / z_2) + \ln v_{it} - \ln u_{it} \tag{3}
\end{aligned}$$

where Π_{it} is the profit of a bank in a given year; Y_i are outputs; W_k are input prices; Z_r is fixed netputs; T is a time trend; v_{it} are identical and independently distributed random errors, which are independent of u_{it} ; u_{it} are non-negative inefficiencies; X_n are adjusted values of logged outputs so that they fall within the interval $[0.1 \times 2\pi, 0.9 \times 2\pi]$ ² and $\alpha, \beta, \psi, \phi, \tau, \varpi, \kappa, \sigma, \eta, a, \text{ and } b$ are parameters to be estimated.

² $\ln(Y_i / z_2)$ are rescaled so that each X_n term falls into the interval $[0, 2\pi]$. Following Berger and Mester (1997), each end of the interval $[0, 2\pi]$ are cut off by 10% so that X_n to span the interval of $[0.1 \times 2\pi, 0.9 \times 2\pi]$ for reducing approximation problems near the endpoints. According to Berger and Mester (1997), the rescaling formula is $0.2 - \mu_i \times a_i + \mu_i \times \ln(Y_i / z_2)$ where $[a, b]$ is the range of $\ln(Y_i / z_2)$ over the entire 11-year time interval, and $\mu_i = (0.9 \times 2\pi - 0.1 \times 2\pi) / (b_i - a_i)$.

The standard restriction of linear homogeneity in input prices is imposed by normalizing the profits and input prices by one arbitrarily chosen input price—the price of fund. Total profits, output variables and netputs are normalized by total assets to control for scale biases and heteroskedasticity.

The empirical inefficiency effect model is shown in Equation (4).

$$u_{it} = \delta_0 + \sum_{a=1}^5 \delta_a CG_{it} + \sum_{b=6}^9 \delta_b Risk_{it} + \delta_{10}t + \delta_{11}GDP + \varepsilon_{it} \quad (4)$$

where CG_{it} is a vector of governance indicators; $Risk_{it}$ is a vector of risk indicators controlling for differences in risk taking behaviours across banks; t is a time trend; and GDP is a proxy for the macroeconomic environment.

Employing a modified version of the intermediation approach (Sealey and Lindley 1977), this paper defines three outputs—total loans, other earning assets, and deposits; two inputs—cost of fund and cost of labour; and one netput—equity. Theoretically, the price of labour and the price of physical capital should be measured separately. Due to the lack of separate data on labour (i.e. personnel expenses), the price of labour and physical capital is defined as the ratio of non-interest expenses to total assets as in Hasan and Marton (2003). The price of funds is defined as the ratio of total interest expenses to total interest bearing funds. Data are collected from BankScope complemented by the Almanac of China's Finance and Banking (1986-2009) and the China Statistical Yearbook (1996-2009). The unbalanced sample includes 47 commercial banks operating in China for the period 1995-2008 with 481 observations. These banks are classified into four main categories according to the nature of owners: SOCBs, JSCBs, CCBs, and foreign banks (FBs). Table 1 provides the summary

statistics. Comparing data in 1997 and 2008, the means and standard deviations of all variables increased while average prices of labour and fund decreased.

[Table 1 here]

There are 12 explanatory variables in the inefficiency effect model: 5 indicators representing the nature of owners, 1 capturing ownership concentration, 4 controlling for risk takings, 1 year trend variable and *GDP growth*. *CCB* is a dummy variable that equals 1 if the bank is a regional city commercial bank and zero otherwise. *JSCB* is a dummy variable that equals 1 if the bank is a national wide joint-stock commercial bank and zero otherwise. *SOCB* is a dummy variable that equals 1 if the bank is a state-owned commercial bank (with majority state ownership) and zero otherwise. *FB* is a dummy variable that equals 1 if the bank is a foreign bank (with majority foreign ownership) and zero otherwise. *For-Minority* is a dummy variable that equals 1 if the bank has foreign minority ownership regardless of its original ownership nature and zero otherwise. *LIST* is a dummy variable that equals 1 if the bank is listed on a stock market and zero otherwise. Following Iannotta et al. (2007), this dummy is used as a proxy for ownership concentration. *Capital risk* is the natural logarithm of equity to total asset ratio. *Credit risk* is the natural logarithm of loan loss reserve to gross loan ratio. *Market risk* is the natural logarithm of interbank interest to interest on deposit. *Liquidity risk* is the natural logarithm of gross loan to customer deposits ratio. *t* is a year trend dummy. *GDP* is the natural logarithm of GDP growth rate, controlling for the macroeconomic environment in which banks operate.

5. Empirical results

Estimation results of the alternative profit frontier are reported in Table 2. We have also tested a few alternative specifications and regression results are robust. For brevity, only this final version of specification is reported.

[Table 2 here]

The estimated γ is 0.86, indicating that a large part of the total composite error term is attributable to inefficiency. The LR test statistic is 238, confirming the existence of a one-sided error within the composite error term. The mean profit efficiency is estimated at 61 per cent, suggesting banks on average earn 39 per cent less than the maximum possible profit earned by a best practice bank using the same bundle of inputs under the same conditions.

As shown in Figure 1, the mean profit efficiency increased steadily by 62 per cent from 20 per cent in 1995 to 82 per cent in 2007 and dropped in 2008 by 6 per cent signifying the impact of the worldwide financial crisis in 2008-2009. These efficiency gains are attributable to two main reasons: (1) two rounds of off-loading of NPLs from major commercial banks in 1999 and in 2003-2010, which significantly improved bank asset quality and therefore profitability; and (2) improvement in bank management and operational skills as well as management awareness of profit maximisation after three decades of reform.

[Figure 1 here]

Results from the inefficiency effect model (reported in Table 3) are of particular interest as they offer insights into the effects of corporate governance on performance thereby providing information for policy makers regarding the ongoing banking reform in China.

[Table 3 here]

CCB is excluded from the regression so that the estimated coefficients of *FB*, *JSCB* and *SOCB* measure the effect of each ownership structure on performance relative to *CCBs*. Our results show that the nature of owners has significant impacts on bank performance. Both *JSCB* (δ_1) and *SOCB* (δ_2) are statistically significant at the 1% level and both have positive signs, indicating *JSCBs* and *SOCBs* are less profitable than *CCBs*. In other words, *CCBs* are the most efficient domestic banks. A caveat is that this result may be overestimated and the actual average performance of *CCBs* would be lower. Our sample includes only 25 *CCBs* out of 112 for those whose data are available for at least five years. It is argued that banks with better management and performance are more likely to make data publicly available. On the other hand, these 25 *CCBs* are the most influential ones with total assets counting for more than half of the total asset of 112 *CCBs* in 2008. The estimated coefficient for *SOCB* is 2.1 and that for *JSCB* is 0.97, implying that *SOCBs* are twice as inefficient than *JSCBs*. In fact, *SOCBs* are the least efficient banks, consistent with mainstream literature regarding state ownership.

FB (δ_3) is statistically significant at the 10% level with a negative sign, suggesting that foreign banks are more efficient than *CCBs* that are the most profitable domestic banks. This result provides weak evidence for the global advantage hypothesis that foreign institutions seems to take advantage of their superior managerial skills and high quality

human capital (Berger et al., 2000). It is consistent with Berger et al. (2009) who found foreign banks to be the most efficient in China and Claessens *et al.* (2001) who document the tendency for the global advantage hypothesis to hold in developing countries. However, the findings need to be interpreted with caution as foreign banks in China had been subject to several operational and geographical restrictions and a high level of entry barriers. In the early 1980s, the Chinese government opened the door of financial market, but just a crack, to foreign financial institutions. Foreign banks were first allowed to open representative offices and subsequently permitted to open operational branches in Special Economic Zones. This geographical restriction was extended to 23 coastal cities in the first half of the 1990s and foreign banks were allowed to open branches across China in 1996. Foreign banks were still restricted to serving foreign companies and residents and to conduct foreign currency business only. China's entry to the WTO implied a gradual removal of these barriers and restrictions in five years and foreign banks started to compete with domestic banks at the same playing field from the end of 2006.

Figure 2 plots the mean profit efficiency by the nature of owners, which shows the trend and differences in bank performance with different ownership structures. Efficiency levels of all types of banks have improved with a converging trend. SOCBs are the least efficient banks and their average efficiency level was below 10 percent before the first round of bailout in 1999, and slowly reached 23 percent in 2002. Thereafter, as the government implemented more radical reforms, SOCBs enjoyed significant gains in efficiency which peaked at 80 per cent in 2007. JSCBs exhibited steady improvements in efficiency up to 2007, followed by a drop in 2008. The efficiency level of CCBs is

relatively stable, while that of FBs fluctuates drastically. Both FBs and CCBs seem to be resistant to the financial crisis, unlike JSCBs and SOCBs that suffered downward shocks in 2008 when financial crisis started.

[Figure 2 here]

For-Minority (δ_4) is statistically insignificant in spite of a negative sign. In other words, banks with minority foreign ownership are not more profitable than those banks without foreign investment. This finding, however, is inconsistent with Berger et al. (2009) that find minority foreign ownership is associated with significantly improved efficiency. We consider this inconsistency due to the difference in sample period of two studies. Berger et al. (2009) cover the period 1994-2003, while foreign direct investment in the banking sector surged in 2004 and peaked in 2005. Before 2004, foreign investors were cautious and only took minority ownership in well-selected, outstanding JSCBs (i.e. Pudong Development Bank by CITI Group) and CCBs (i.e. Bank of Shanghai by HSBC). Most foreign minority shareholdings in domestic banks were taken up after 2004. Our sample period is up to 2008, allowing us to depict a more complete picture regarding the impacts of foreign minority ownership on bank performance.

The Chinese government has made considerable efforts to attract foreign strategic investors for its major banks, but the expected benefits from foreign minority ownership have not yet been shown. One possible reason is that after foreign owners take minority ownership, banks have undertaken more investing activities like upgrading technology and prudential practices such as more loan loss provision, which sacrifice profitability at present or in the near future but will benefit the banks in the long run. An alternative

explanation is that it takes more time to realise the potential benefits brought by foreign minority owners since superior managerial and operational skills cannot be transferred in a short time period. Moreover, the Chinese government has set upper limits for foreign ownership in domestic banks: 25 per cent for total foreign ownership and 20 percent for a single foreign investor. For SOCBs, the central government holds a majority controlling stake. It is doubtful whether foreign investors have sufficient power and ability to influence the decision making processes so that they can apply their operational and managerial skills.

The coefficient on *LIST* (δ_5) is statistically significant and negative. The implication is that banks with dispersed ownership structure are more efficient. This result seems in contradiction with the agency theory. However, some benefits, such as better risk-bearing (Demsetz, 1983) and market discipline mechanisms, may have offset the agency costs arising from diffused ownership structure, making publically owned companies more successful.

Moving on to banks' risk taking characteristics, *Capital Risk* (δ_6) is insignificant and therefore has no impact on bank performance in China for the period under investigation. In fact, there is a trade-off between capital and profitability: the higher the capital to asset ratio, the lower the capital risk and profitability, holding other things equal. The ratio of loan loss reserve to gross loan is the proxy for credit risk. The higher the ratio, the higher is the credit risk. The coefficient on *Credit Risk* (δ_7) is significant at 10 percent level and positive, indicating that banks with higher credit risk are less efficient. The result is as expected— a higher ratio suggests a higher proportion of a

bank's loan portfolio needs to be provided for and to be charged as an expense (loan loss provision) against total income. The interbank interest to interest on deposit ratio reflects the degree that a bank relies on interbank market as a source of funding. It measures the extent to which a bank is exposed to the risk of changes in market rates. The higher the ratio, the higher is the market risk faced by a bank. A positive and significant coefficient on *Market Risk* (δ_8) means that higher market risk is associated with poor performance. The proxy for bank liquidity risk is the ratio of gross loan to customer deposit and a higher ratio represents higher liquidity risk. A positive and significant coefficient on *Liquidity Risk* (δ_9) suggests that a bank facing higher liquidity risk suffers efficiency losses despite of the trade off between liquidity and profitability.

The year trend variable (δ_{10}) in the inefficiency effect model captures temporal changes in inefficiency against the shifting frontier. The negative and significant coefficient reflects that banks profit efficiency improves as time passes. A healthy GDP growth (δ_{11}) offers a favourable macroeconomic condition which has a positive impact on bank performance.

5. Conclusions and policy implications

Chinese banking has undergone gradual reforms over the past 30 years, which nevertheless have witnessed the accumulation of significant changes in banks' corporate governance structure. This paper has examined the effects of corporate governance on bank profit efficiency for 47 commercial banks operating in China for the period 1995-2008. The dataset covers all the major commercial banks, hence providing sufficient

empirical evidence to test the hypotheses presented at the beginning of the paper. In particular, we have examined how the nature of owners and the concentration of the ownership have affected bank efficiency while controlling for banks risk taking behaviour and macroeconomic environment in which banks operate.

On average, bank efficiency has improved significantly by 56 percent from 20 per cent in 1995 to 76 per cent in 2008. We find weak evidence for the global advantage hypothesis in China that foreign banks (with majority foreign ownership) are more efficient than domestic banks. Majority state ownership is associated with a rather low efficiency and SOCBs are the most unprofitable banks. This result provides strong empirical evidence for recent banking reforms of privatizing state-owned banks in China. The policy implication is that the current reform is in the right direction. Nevertheless, fundamental change in bank management and operations is a complex process. The real impacts of privatisation remain to be seen and this calls for future studies.

Our study finds no significant difference in performance for banks with or without foreign minority ownership. The finding is not in line with the expectations that foreign investors are expected to bring not only much needed capital but also advanced operational and managerial skills (such as skills in financial risk management). Our explanations are: (1) banks may undertake more investment and prudential practices in pursuing long-term benefits at the expense profitability in the short term; (2) it simply needs more time to transfer those skills and to realise benefits; and (3) the upper limit of foreign minority ownership may restrict foreign owners' ability to influence banks'

operational decision making processes thereby hampering the transfer of those expected benefits. This is an area that policy makers should pay more attention to and future research should follow up.

Although agency theory suggests that the separation between ownership and management induces agency costs due to the possible conflicts in their interests, we find that banks with more dispersed ownership structure are more efficient. Moreover, all risks under consideration have significant adverse impacts on bank profitability except for capital risk that has no significant impact. Banks with higher credit risk, market risk and liquidity risk are more inefficient. Banks have become more efficient as time passes and a favourable macroeconomic environment helps banks improve performance.

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Table 1: Sample Descriptive Statistics (1997, 2008)

	1997				2008			
	Mean	SD	Max	Min	Mean	SD	Max	Min
Profit	34	51	178	1	125	271	1253	5
Gross Loans	2744	5239	17920	1	4146	8553	34752	2
Other Earning Assets	1311	2391	9179	6	3859	8565	38593	4
Total Deposits	3225	5968	20219	1	6627	14710	62506	4
Equity	156	268	870	2	500	1076	4633	26
Total Assets	4437	8180	26379	8	8342	17730	74164	8
Price of labour	0.02	0.01	0.05	0.01	0.01	0.01	0.02	0.01
Price of fund	0.07	0.06	0.28	0.01	0.02	0.01	0.04	0.01

Note: all variables in RMB billion except for input prices. All variables at 1995 price level.

Table 2 Estimation of the alternative profit frontier

Alternative profit frontier	
Gamma ($\gamma \equiv \sigma_u^2 / (\sigma_v^2 + \sigma_u^2)$)	0.86***
Sigma-squared ($\sigma^2 \equiv \sigma_v^2 + \sigma_u^2$)	0.55***
Log likelihood function	-318
LR test of one-sided error	238
Mean cost efficiency	0.61

Notes: '***' signifies significance at 1 % levels

Table 3 Results of the inefficiency effect model

	Profit efficiency
<i>The nature of owners</i>	
JSCB (δ_1)	0.97***
SOCBs (δ_2)	2.1***
FB (δ_3)	-0.56*
For-Minority (δ_4)	-0.01
<i>The concentration of ownership</i>	
LIST (δ_5)	-0.36**
<i>Risk taking indicators</i>	
Capital Risk (δ_6)	-0.05
Credit Risk (δ_7)	0.07*
Market Risk (δ_8)	0.21***
Liquidity Risk (δ_9)	0.22***
<i>Other controlling variables</i>	
t (δ_{10})	-0.27***
GDP (δ_{11})	-0.92***

Notes: (1): FB = foreign bank, JSCB = joint-stock commercial bank, SOCB = state-owned commercial bank, For-Minority=domestic banks with foreign minority ownership; LIST=bank listed on stock exchange; (2): *, **, *** signifies significance level at 10 per cent, 5 per cent and 1 per cent respectively; (3): Negative sign of the estimated coefficient indicates that the particular variable has a positive effect on cost or profit efficiency and *vice versa*.

Figure 1 Mean profit efficiency level (1995-2008)

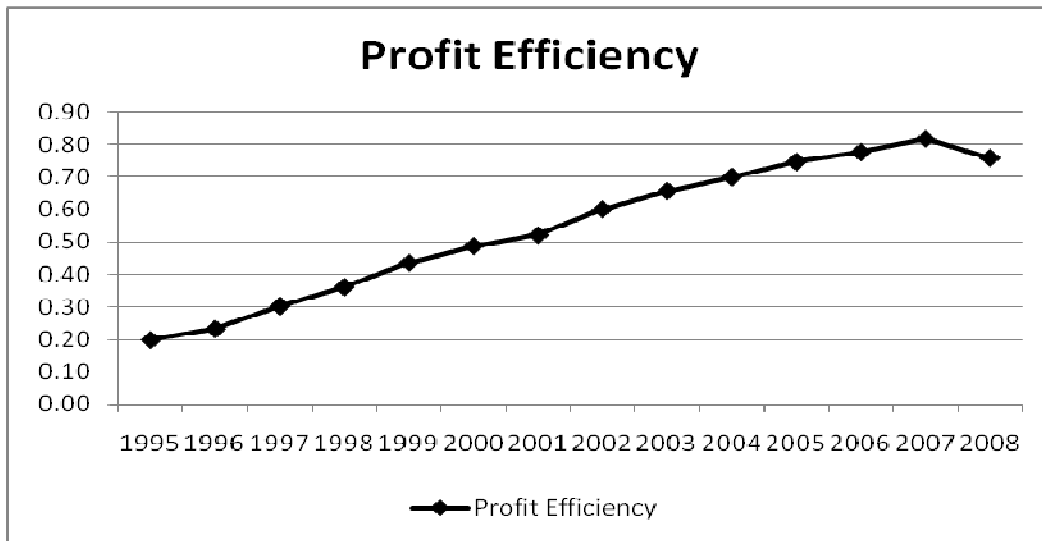
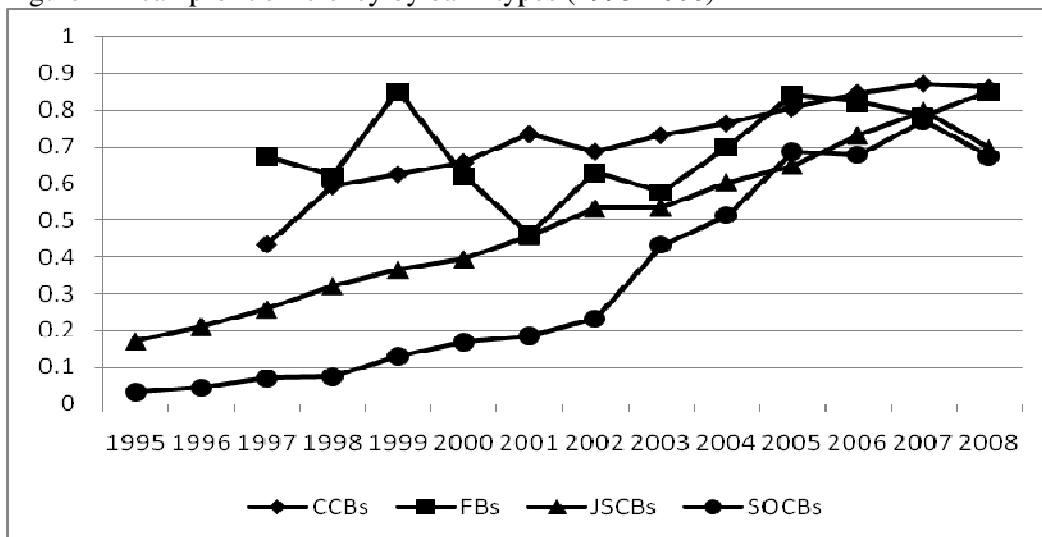


Figure 2 Mean profit efficiency by bank types (1995-2008)



Notes: (1) CCB = city commercial bank, FB=foreign bank, JSCB = joint-stock commercial bank, SOCB = state-owned commercial bank.