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Can a stock market listing help to improve the operational performance of China's banks?

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This study attempts to empirically examine the impact of initial public offerings on China's banking sector. The period considered covers the years 1996–2004. The fixed effects and random effects models are estimated, and the empirical results show that the operational performance of listed banks is inferior to that of unlisted banks. The launching of initial public offerings by Chinese banks is found to have a significant positive impact on the return on assets. Traditional interest income still accounts for by far the largest share of the Chinese banks' operating revenue.

Keywords: initial public offerings; operational performance; China's banking sector

JEL Classifications: G21, O16, P34

1. Introduction

On 14 October 2005, China Construction Bank – one of China's big four state-owned commercial banks (SCBs) – launched its initial public offering (IPO) on the Hong Kong stock exchange. In all, China Construction Bank planned to issue 26.49 billion Hong Kong dollars worth of "H Shares", priced at HK$2.35 per share; the bank was thus aiming to raise HK$62,242 million through the IPO. The Hong Kong listing of China Construction Bank was the first listing by any major Chinese bank on an overseas stock exchange.[1] The Bank of China, the Industrial and Commercial Bank of China (ICBC) and the Agricultural Bank of China were also planning stock market listings, as part of the reforms that have been taking place in the state-owned commercial banking sector.

In China, the process of financial sector liberalization began to deepen following its economic reforms. One of the commitments made by China to secure membership of the World Trade Organization (WTO) in December 2001 was to make the opening up of the financial sector a priority. In the case of developing nations, however, the opening up of the financial sector can pose a severe challenge to domestic banks; the impact on the development of the financial sector as a whole can be severe and far-reaching. The rapid integration with the world economy has required the country to reform *inter alia* its financial sector to enable it to cope with the dramatic increase in capital flows between China and other countries. Foreign banks were to be able to access the Chinese financial market without any restrictions with regard to regions, clients and currencies before the end of 2006. With the restrictions on renminbi (RMB) business being gradually lifted, foreign banks are likely to expand their foreign exchange business and increase their market share in RMB transactions,

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all at the expense of state-owned commercial banks. To be sure, foreign banks are clearly at an advantage in terms of technology, funding and skilled manpower.

Banking problems represent one of the biggest risks for the post-WTO Chinese economy. From a historical perspective, banks in China have been more of a tool for policy application than a true financial institution with profitability as the primary objective. Because of the defects in the financial system, high savings cannot be converted into effective investments of enterprises and consumer demand. The experiences of Eastern European countries in terms of financial reform indicate that institutional transformation is the key to success in the liberalization of the financial market, and the legal framework that protects the implementation of contracts is of particular importance (Clarke *et al*. 2005). China needs to ensure that its legal system conforms to WTO requirements, by establishing new laws, as and when necessary, in accordance with those requirements.

The Chinese government has formulated a plan to transform the four SCBs into large, modern commercial banks with sound corporate governance, strong operational mechanisms, clear operational objectives, sound finances and a high level of international competitiveness. The reform process will be implemented in three stages: the adoption of commercial management methods, conversion to corporate status and then a stock market listing.

The Chinese economy is still undergoing a process of transformation; as a result, the development of China's banking system has followed a unique pattern. There are currently four main types of banks operating in China: state-owned commercial banks, regional and national shareholding commercial banks, city commercial banks and foreign banks. As of the third quarter of 2007, the big four state-owned commercial banks had combined assets of RMB27,462.98 billion, accounting for 54.3% of the total assets of all banks in China. The shareholding commercial banks had total assets of RMB6879.17 billion, representing 13.6% of total banking sector assets. As the process of economic transformation has not yet been completed, and as banking regulation in China has yet to reach a reasonable level of maturity, China's banking sector still lacks the environment needed for effective corporate governance. For example, independent directors have appeared only recently and have not yet become widely used. Risk management has been a blurred concept until recently, and the banks need to develop a culture of disclosure, including in the accounting and finance areas in particular. At the same time, the opaque ownership structure of the big four state-owned banks makes it difficult for them to operate in a truly autonomous manner as the core element in the financial system. This is why financial reform in China has focused on the big four.

Restructuring the big four as shareholding commercial banks and having them listed on the stock market represents a major step forward in the modernization of the banking sector; banks that are structured as shareholding banks will be much more attractive to profit-minded foreign (and domestic) investors. The conversion of the big four into shareholding banks will encourage further restructuring and improvement in governance mechanisms; it will stimulate the adoption of new operational models, and the introduction of overseas banking techniques and systems. Eventually, China will possess commercial banks that are fully internationalized and truly modern. Besides reforming the big four state-owned banks and encouraging them to implement IPOs, the Chinese government has also been expanding the scope of its financial sector reform efforts to include the second-tier shareholding commercial banks. To take one example, in 2007, the reform program implemented by the government for China Everbright Bank included a RMB20 billion capital injection to assist in the process of writing off non-performing loans, a raising of the capital adequacy rate (which had previously stood at just 5%), and efforts to improve

the bank's financial indicators so as to attract foreign investment. Once this reform program has been completed, China Everbright Bank will be looking to be listed on either the Hong Kong stock exchange or one of China's domestic stock exchanges by 2008. One important condition for the state-owned commercial banks to be listed on the stock exchanges is for them to substantially reduce the level of their non-performing loans (NPLs) and significantly increase their working capital. Capital injection has been used to reduce NPLs and increase working capital in China's financial transformation, i.e., on 6 January 2004, China doled out a total of US$45 billion of its foreign exchange reserves to undertake a pilot reform to restructure the Bank of China and the China Construction Bank into shareholding commercial banks. The Chinese government's repeated injections of capital into the state-owned commercial banks are, however, not a panacea for all the challenges faced by the Chinese banks. Instead they have compounded the risks banks face by encouraging morally hazardous behavior through reckless lending. Besides constituting the most direct way for a bank to raise its capitalization, a stock market listing also helps to improve governance through external monitoring and regulation; this is another reason why the Chinese government has been encouraging banks to implement IPOs. By the end of 2004, five Chinese banks (Shenzhen Development Bank, Shanghai Pudong Development Bank, China Minsheng Bank, China Merchants Bank and Hua Xia Bank) had been listed on the Shanghai or Shenzhen stock exchange.

The IPO of the Bank of China on the Hong Kong and Shanghai exchanges in May 2006 raised US$11.2 billion. On 27 October 2006, the Industrial and Commercial Bank of China launched its IPO which was worth as much as US$21.9 billion on the Hong Kong and Shanghai exchanges. ICBC's simultaneous listing on the Hong Kong Exchange and Shanghai stock exchange was the world's largest IPO to date, and it was also the first company to debut simultaneously on both the Hong Kong and Shanghai stock exchanges. On 5 February 2007, the Industrial Bank launched its IPO on the Shanghai stock exchange. All of the RMB16 billion raised by the Industrial Bank from issuing 1.001 billion A-shares will be used to replenish capital, raise capital adequacy, and enhance risk prevention capacity. In addition, Central Huijin Investment Corporation (a state-owned investment vehicle) has already planned to inject US$40 billion into the Agricultural Bank of China to kick off the bank's split structure reform. However, the reform of the Agricultural Bank of China will face more severe problems concerning the basic financial services offered to the agricultural sector, the rural areas and farmers.

The successful IPOs of the China Construction Bank, the Bank of China and the Industrial and Commercial Bank of China show that the Chinese government has transformed state-owned commercial banks into shareholding companies. Nevertheless, given that managers of the bank know more about the bank's prospects than potential equity investors, if investors' expectations are high, that will drive up the stock price. When more information is available, the stock price will eventually settle at a rational level at which the IPOs' potential will be appraised by the market mechanism (Morris 1996). Large-scale transformation is the most complex and challenging initiative that state-owned commercial banks can undertake, and a listing is not a guarantee of success. A listing on the Hong Kong exchange or an international listing can provide an effective mechanism to mitigate the consequences of discretionary policies and managerial opportunism in China, because the Chinese banks are now disciplined and regulated by a more developed capital market (Sun and Tobin 2005). With the high level of concentration in terms of deposits, loans, assets and net profits in the Chinese banking sector, banks will tend to give priority to risk avoidance, rather than merely maximizing profits and efficiency. It therefore remains to be seen whether these shareholding commercial banks will eventually become more competitive.

Since the early 1990s, the Chinese government has been working aggressively to reform the financial system. The year 1994 saw the restructuring of the big four state-owned banks as commercial banks. In 2001, as part of its WTO pre-accession commitments, China undertook to complete the opening up of its financial markets by the end of 2006, a move that would inevitably lead to a heightening of market competition.[2] Indeed, banking reform in China has been an unfinished yet urgent task, tied closely to the reform of state-owned enterprises (SOEs) as well as economic growth (Cull and Xu 2005). With China now in the WTO, reforming the sector seems to be an all the more pressing need. The vast majority of the world's leading banks are shareholding banks that are listed on the stock market, and are thus able to access funds from the capital markets to diversify their operations or build market share. These potential advantages have led many Chinese banks to start working towards obtaining a stock market listing. Today, more than 15 years after the process of financial sector reform began in earnest, it needs to be asked whether the trend towards obtaining a stock market listing is beginning to have a significant effect on the development of China's banking industry.

To date, there has been surprisingly little empirical research that has focused on the impact of a stock market listing on China's banking sector, although studies by Chen and Shih (2003) analyzed the data for 1995–1999 and did suggest that a stock market listing led to a significant improvement in banks' operational performance. Chen, Li and Moshirian (2005) analyzed the reaction of the rival banks and non-bank financial institutions, listed both on the Hong Kong exchange and on China's two stock exchanges, to the privatization announcements of the Bank of China Hong Kong (BOCHK), which could have had a bearing on these rival banks' stock prices and long-term profitability. The results show that banks in Hong Kong have not been significantly impacted by the privatization of BOCHK, but non-bank financial institutions exhibited significant negative reaction to the privatization. Most of the financial institutions in China reacted positively to the announcement of the privatization.

This study will attempt to empirically examine the impact of IPOs on China's banking sector. Particular emphasis will be placed on the unique characteristics of China's banking industry during this period of institutional transformation; this uniqueness will be taken into account when evaluating the impact of obtaining a stock market listing on a bank's operational performance.

Pooled cross-section (banks) and time-series data are employed in the empirical estimation, and the period considered extends from 1996 to 2004. As the data used are panel data, and the fixed effects and random effects models are estimated, the Hausman test is used to choose between the fixed effects variables and random effects variables. The remainder of this paper is organized as follows. The next section describes the empirical model and the data and is followed by an analysis of the empirical results. The paper closes by outlining the conclusions drawn from this study.

2. Empirical model

The purpose of this study is to examine whether a stock market listing is helpful to improving the operational performance of China's banks. In light of the arguments by Unite and Sullivan (2003), Beck *et al*. (2005), and Boubakri *et al*. (2005), the dependent variable and independent variables of the empirical models are explained as follows. As for the dependent variable, we focus on two of the performance measures – the return on assets (ROA) and the return on equity (ROE). The ROA is defined as the ratio of profits to total assets, and the ROE is calculated as the ratio of profits to equity. They are commonly used as performance indicators.

The independent variables of the empirical model include the effect of a stock market listing, controlled variables for other bank characteristics and macroeconomic factors that affect all banks (Unite and Sullivan 2003, Beck *et al*. 2005).[3] We use the dummy variable technique to measure the differences in operating performance between the listed and unlisted banks, as well as the effect since the banks implemented the IPO. The time that has passed since the banks implemented the IPO is also included as an independent variable to measure the impact of a stock market listing on operational performance over time.

Model 1 (Equation 1) is used to examine the effect of a stock market listing on the bank's operational performance. In light of the arguments by Beck *et al*. (2005), Boubakri *et al*. (2005) and Unite and Sullivan (2003), Model 1 is then specified as follows:

$$I_{it} = \alpha_0 + \beta_1 PL_{it} + \beta_2 PPL_{it} + \beta_3 PLA_{it} + \gamma_k B_{it} + \delta_j X_t + \varepsilon_{it} \quad (1)$$

where I_{it} is the ROA or ROE for bank i at time t. Since company income tax data are not available, ROA is defined as net profit before tax divided by total assets and ROE is defined as net profit before tax divided by equity. PL_{it} is a dummy variable, which equals 1 throughout the whole sample of listed banks during the sample period. We include this variable to capture any selection effects associated with a stock market listing. PPL_{it} is a dummy variable, which equals one from the moment bank i completes the IPO process. This variable measures the effect of the IPO itself. PLA_{it} is the time that has elapsed since the bank implemented the IPO, which measures the impact of the IPO on operational performance over time.

The controlled variables (B_{it}) include the size and age of the bank and its business orientation. We control for the age of the bank (Age), since banks established for longer periods might have enjoyed performance advantages over relatively new banks. Larger banks might also have enjoyed scale or scope economies that positively affected their performance and, therefore, the size of a bank in terms of its assets (Scale) is used to control for its size. On the other hand, the higher operating costs of the SCBs are due to their enormous size, and particularly the excessively large number of employees on their payrolls. The ownership structure seems to matter for the operational performance of the banking sector. Because of the difficulty in obtaining accurate shareholding data for all years, it has not been possible to examine the impact of this variable on bank performance. In the Chinese banking industry, larger banks tend to be state-owned; therefore, the Scale can also be considered as a proxy variable for ownership structure. The ratio of non-interest income (RNI) is also used to capture the business orientation of the bank.

We include two variables to control for macroeconomic factors (X_t), namely, per capita GDP (PCG) and changes in the property rights system. Per capita GDP is used to control for the business cycle. The most unique aspect of institutional transformation in China is surely the changes that have taken place in terms of property rights. Prior to the commencement of institutional transformation, the ownership system that existed under the centrally planned economy was dominated by the public ownership of property rights. Once the economic reforms began, public ownership became less dominant. In the case of state-owned enterprises (SOEs), the budgetary constraints under which they operate are soft constraints; their funding comes from the government, with no regard for the enterprise's repayment ability. This gives rise to moral hazard, and pushes up the state-owned banks' non-performing loan ratio. In 1980, state-owned enterprises accounted for 75.98% of total industrial production value; by 1990 this figure had fallen to 54.61%, and by 2004 it had fallen to 35.24% (*Statistical Yearbook of China*, 1991, 1999, 2005 (State Statistical

Bureau 1991, 1997–2005)). Indeed, individual incentives are a *sine qua non* of economic progress, depending in large part on the institution of property rights (Hayek 1960, pp. 39–53). It is clear that the establishment of a property rights system shapes incentives, thereby determining the rules of just conduct and influencing the economic outcome of human action. Having a clear system of property rights helps to reduce transaction costs and uncertainty, while also boosting efficiency (Alchian 1961). Changes in the property rights system (CPR) are difficult to quantify. In the spirit of measurement by Scully and Slottje (1991) and Torstensson (1994), the indicator used in this study is the total value of non-state-owned industrial production as a percentage of the total industrial production value (Chen and Wu 2005).

The fixed effects regression model is then estimated as follows:

$$I_{it} = \alpha_j + \beta_1 PL_{it} + \beta_2 PPL_{it} + \beta_3 PLA_{it} + \gamma_k B_{it} + \delta_j X_t + \varepsilon_{it} \tag{2}$$

where α_j is the bank-specific factor, which is a fixed value representing the special characteristics of individual banks.

Moreover, the random effects regression model is estimated as follows:

$$I_{it} = (a_0 + u_j) + \beta_1 PL_{it} + \beta_2 PPL_{it} + \beta_3 PLA_{it} + \gamma_k B_{it} + \delta_j X_t + \varepsilon_{it} \tag{3}$$

where u_j is I.I.D.$(0, \sigma_u^2)$, which represents the bank-specific factor, and (α_0+u_j) is a random variable.

Model 2 (Equation 4) is a simplified version of Model 1 and is used to reexamine the effect of IPO on the banks' operational performance. The variable for PPL is removed from Model 1. The definitions of the variables are the same as those in Model 1.

$$I_{it} = \alpha_0 + \beta_1 PL_{it} + \beta_2 PLA_{it} + \gamma_k B_{it} + \delta_j X_t + \varepsilon_{it} \tag{4}$$

The time period considered extends from 1996 to 2004, and the sample comprises 14 Chinese banks, including four SCBs (the Industrial and Commercial Bank of China, Agricultural Bank of China, the Bank of China, and the China Construction Bank) and 10 shareholding commercial banks (the Bank of Communications, China Merchants Bank, CITIC Industrial Bank, Shenzhen Development Bank, Industrial Bank, Guangdong Development Bank, Shanghai Pudong Development Bank, China Everbright Bank, China Minsheng Bank, and Hua Xia Bank).

Since China Everbright Bank did not publish complete balance sheet and income statement data for 2004, these data have been treated as missing values in our empirical analysis. Most of the state-owned commercial banks were listed in late 2005 or late 2006, and the areas of focus in the post-IPO performance are improvements in operating efficiency, the strengthening of risk management and internal controls and the building up of a trusted brand. Successfully completing these processes could take many years. The time span of the post-IPO period is too short to satisfactorily judge their operational performance, and the financial data are not fully available. The data used in this study comprise panel data, and have been calculated based on the balance sheet and income statement data for individual banks published in the *Almanac of China's Finance and Banking 1997–2005* (China's Finance and Banking Association 1997–2005). Data were also obtained from various issues of the *Statistical Yearbook of China 1997–2005* (State Statistical Bureau 1991, 1997–2005). Summary statistics of the variables used in the estimation are shown in Table 1.

Table 1. Summary statistics of variables used for 1996–2004.

	ROA	ROE	PLA	Age
Mean	0.739	15.881	1.071	9.85
Median	0.551	14.502	0	10
Standard Deviation	0.662	12.106	2.80	4.45
Kurtosis	2.174	0.497	8.934	−0.8
Skewness	1.439	0.919	3.037	0.06
Minimum	−0.045	−0.677	0	1
Maximum	3.152	56.551	14	19
Sample	125	125	126	126
	RNI	Scale	PCG	CPR
Mean	22.199	10292.7	7456.88	63.365
Median	21.023	2793.01	7086	63.68
Standard Deviation	15.007	13914.5	1525.07	6.367
Kurtosis	2.142	0.981	−0.478	−1.090
Skewness	1.086	1.441	0.743	−0.199
Minimum	0.108	85.943	5576	52.664
Maximum	85.782	59705.2	10561	71.794
Sample	125	125	126	126

3. Empirical results

The present study makes use of panel data (combining cross-sectional and time series data) for 14 Chinese commercial banks. As noted by Hsiao (1986), the use of panel data makes it possible to achieve increased sample size and degrees of freedom, with improved efficiency of estimation. Estimation bias is lower than would be the case with either time-series or cross-sectional data, and multicollinearity is less of a problem. The more comprehensive data provided by the use of panel data also helps to reduce errors in model specification and in parameter estimation.

If regression analysis had been performed on the panel data using the ordinary least squares (OLS) method, it would have ignored the differences between banks, and it would have been impossible to determine the direction of error, thus giving rise to a risk of heterogeneity bias. It was therefore felt that the use of the fixed effects and random effects models would be more appropriate.

The empirical analysis focused on whether a stock market listing might help to improve the operational performance of China's banks. Before beginning the estimation process, pairwise correlation coefficients were calculated for all the explanatory variables to avoid the risk of multicollinearity. The absolute values of the correlation coefficients for all independent variables were found to be within the range of 0.029 to 0.588, and so the issue of multicollinearity could be ignored. Moreover, sensitivity tests were used to develop a more robust set of empirical results from the empirical models. According to the sensitivity tests, if the coefficients are not sensitive to the inclusion of different variables, e.g., the coefficients do not change signs or become insignificant, then the variables can robustly affect the dependent variable. Only the robust results of the empirical model are presented.

Table 2. Empirical results of Equation (1) for ROA, 1996–2004.

	Fixed Effects	Random Effects
PL	–44.360 (–4.830)***	0.0067 (0.025)
PPL	0.376 (2.014)**	0.210 (1.165)
PLA	–0.084 (–1.711)*	–0.032 (–0.895)
Age	–0.421 (–4.687)***	–0.026 (–0.957)
RNI	–0.007 (–2.078)**	–0.006 (–1.880)*
Scale	–0.517 (–3.772)***	–0.363 (–4.857)***
PCG	5.972 (5.314)***	0.449 (0.938)
CPR	0.0002 (0.974)	0.014 (2.293)**
Adjusted R^2	0.701	0.307
F test	6.6021 (Fixed effects model is acceptable)	
Hausman test	CHISQ (6)=40.998*** P-value=[0.000] (Fixed effects model is acceptable)	

Notes: t-statistics are in parentheses. ***Indicates significance at the 1% level; **Indicates significance at the 5% level; *Indicates significance at the 10% level.

The results obtained in the empirical tests of whether stock market listings have helped to improve the operational performance of China's banks are shown in Table 2. The Hausman test values indicate that the random effects model could be rejected in favor of the fixed effects model. As can be seen from Table 2, the main findings obtained for the case of the ROA were as follows. Firstly, the operational performance of listed banks is inferior to that of unlisted banks, since the estimated coefficient of PL is demonstrated to be negative. The implementation of IPOs by Chinese banks during the period covered by the study had a significant positive impact on the ROA, as the estimated coefficient of PPL is shown to be positive; however, over time, the impact on ROA became negative again (the estimated coefficient of PLA is shown to be negative with a 10% significance level). It appears from these results that a stock market listing does not necessarily translate into operational performance superior to that of banks that have not been listed. Although an improvement in ROA can be seen during the period immediately following the listing, ROA performance worsens over time. It would seem that the act of listing does provide some positive stimulus; at the least, it helps to make the bank better known, which has an intangible but significant impact in terms of helping the bank to expand its scale of operations. However, these short-term benefits are not accompanied by long-term benefits. While a stock market listing may help a bank to raise capital and give a brief boost to its performance indicators, it does little to improve the bank's corporate governance during the sample period; once the short-term benefits wear off, the long-term performance of the bank after the IPO is poor. In order to implement the initial public offering and secure a stock market listing, banks tend to submit inflated figures in the financial statements that they are required to provide; the real situation is gradually reflected after the bank has secured the listing. Although working capital may

have increase after listing, there has been no corresponding improvement in operational management. As a result, the longer the period of time that has elapsed since the bank's IPO, the worse will be the bank's ROA performance.

These results are similar to those reported in Jain and Kini's (1994) examination of the impact of a stock market listing on a company's operational performance in the first year following the IPO. From a sample of 83 IPOs completed between 1992 and 1995, Aharony *et al*. (2000) found that the median firm ROA peaked in the IPO year and declined thereafter. The post-IPO decline in the ROA is statistically insignificant in protected industries such as petrochemicals, energy and raw materials; firms in the protected industries are favored by the Chinese government in the selection process. Wang *et al*. (2004) pointed out that China's listed firms experience a sharp deterioration in accounting profits due to pre-listing window-dressing or post-listing expropriation by the parent SOEs. Cheng *et al*. (2006) showed that the existence of pre-listing does not guarantee good long-term IPO performance on the Hong Kong exchange. In a related paper, Fan *et al*. (2007) indicated that Chinese firms with politically connected CEOs underperform compared to those without politically connected CEOs and have poorer three-year post-IPO earnings growth and sales growth.

The coefficient of Age has a negative sign and is statistically significant at the 1% level. The longer a bank had been in existence, the worse its ROA performance was. It may be that more recently established banks are better placed to develop new business opportunities. Most of them are regional or national shareholding commercial banks and are run along modern lines, with their ultimate objective being the maximization of profits. Their management is based on their asset–liability ratio, with clear property rights and a flexible management mechanism. China's big four state-owned commercial banks were originally policy banks whose main role was to implement the tasks assigned to them by the government; as a result, their ability to innovate is somewhat limited. Although the state-owned commercial banks dominate the Chinese banking industry, they are affected by a lack of clarity with respect to ownership, and government interference. They also lack effective risk management and incentive mechanisms, and their internal controls are weak. These results are in accord with the conclusions of Beck *et al*.'s (2005) study on the relationship between bank privatization and performance in Nigeria. Because property rights in China remain weak, political factors rather than economic ones have played an important role in the public listing decision for state-owned banks. The extant literature on Chinese bank efficiency is quite contradictory; for example, Chen, Skully and Brown (2005) found that the big four and small shareholding banks are cost efficient relative to the medium-sized shareholding banks. However, Shih *et al*. (2007) indicated that medium-sized national shareholding banks perform considerably better than the big four banks and smaller city commercial banks. The study of Fu and Heffernan (2007) showed that the shareholding banks are found to be more X-efficient than the state-owned commercial banks.

It is also observed that there was a negative correlation between the non-interest income's share of total revenue (RNI) and the ROA. Intermediary business (off-balance-sheet business) is a bank's main source of service change income, and it is also an important means of building up its customer base. It is necessary for banks to gain an understanding of what society needs in the way of intermediary services, so that they can develop the relevant business. To develop their financial intermediary business, banks need to spend heavily on advertising, brand building and product planning, and it takes time for these efforts to pay off. It may thus be that the result reported above is due to the fact that Chinese banks are still in the early stages of developing intermediary businesses. The coefficient of Scale is negative and is statistically significant at the 1% level; the more assets a bank has, the

worse its ROA performance. This reflects the fact that Chinese banks have tended to focus on asset growth, while failing to establish comprehensive risk management systems and paying insufficient attention to asset quality. The last two results are not in conformity with those reported by Beck *et al*. (2005).

The coefficient of PCG has a positive sign and is statistically significant at the 1% level. As China's economy continues to grow and per capita GDP rises, the financial sector will eventually reach a higher level of maturity, leading to a significant improvement in the banks' ROA. Finally, changes in the property rights system (CPR) are not found to have any significant effect on the ROA.

As can be seen from Table 3 for the case of the ROE, the estimated coefficient of PL is negative at the 1% significance level, thus suggesting that the operational performance of listed banks is inferior to that of unlisted banks, which is the same result as that found in the ROA case. Nevertheless, the implementation of IPOs by Chinese banks had a significant negative impact on the ROE, as the estimated coefficient of PPL was negative. However, over time, the impact on the ROE became positive again (the estimated coefficient of PLA was positive at the 10% significance level). These results indicated that a stock market listing does not translate into an ROE superior to that of banks that have not been listed. As the Chinese banks implemented IPOs, the capital stock grew. If the growth rate in the capital stock was higher than that of the profit, it would lead to a fall in the ROE, and an improvement in the ROE could not be seen during the period immediately following the listing. However, while Chinese bank managers may in their self-interest give the appearance of better performance through earnings management, they are more likely to use the loan loss provision to eliminate small earnings decreases and report longer strings of consecutive

Table 3. Empirical results of Equation (1) for ROE, 1996–2004.

	Fixed Effects	Random Effects
PL	−852.195 (−4.937)***	11.145 (2.298)**
PPL	−9.111 (−2.598)**	−7.986 (−2.366)**
PLA	1.748 (1.901)*	1.545 (2.390)**
Age	−8.482 (−5.020)***	−0.025 (−0.051)
RNI	−0.114 (−1.691)*	−0.119 (−1.874)*
Scale	0.656 (0.255)	−2.370 (−1.762)*
PCG	107.2 (5.076)***	7.791 (0.903)
CPR	−0.181 (−1.447)	0.059 (0.505)
Adjusted R^2	0.620	0.352
F test	5.7047 (Fixed effects model is acceptable)	
Hausman test	CHISQ (6)=34.694*** P-value=[0.000] (Fixed effects model is acceptable)	

Notes: t-statistics are in parentheses. ***Indicates significance at the 1% level; **Indicates significance at the 5% level; *Indicates significance at the 10% level.

earnings increases and, therefore, ROE performance improves over time. Similar to the results in the ROA case, the estimated coefficients of Age, RNI and PCG have a significant impact on the ROE, and changes in the property rights system (CPR) have no significant effect on the ROE.

There are several other factors that might explain why the operational performance of listed banks is inferior to that of unlisted banks. These are described as follows.

1. Unsatisfactory stock market regulation

In a stock market with a mature, properly functioning market mechanism, the disclosure of information should be more or less complete. Market transactions and changes in stock prices will then guide funds towards the best-performing companies. In China, only a little more than a decade has passed since the development of the capital markets began, unlike the situation in other countries where the markets have had much longer to develop. China's stock markets are still in development with only limited participation of institutional investors, and most domestic investors are inexperienced individual investors. Owing to their limited knowledge, lack of experience and restricted access to information, they tend to blindly follow the herd, ignoring relations with fundamentals (i.e., price/earnings ratios), leading to increased speculation, and much more severe market fluctuations. Under these circumstances, it is inevitable that many of the markets' regulatory and operational mechanisms will display weaknesses. The situation in China is that banks tend to view a stock market listing mainly as a means for securing a short-term capital infusion. Prior to obtaining a listing, they will try to make their performance indicators look as good as possible (window dressing), but once the bank has been listed little effort will be made to improve corporate governance. Once the short-term boost has ended, performance will decline again.

2. Weak corporate governance

The key issue here is that, even when a Chinese bank has completed its stock market listing, "state shares" (owned by the state) and "legal person" (LP) shares (also directly or indirectly owned by the state) still account for a very high percentage of the bank's total outstanding equity. Of the five banks that had been listed on the stock market as of 2004, only China Minsheng Bank had no state shares. In each of the other four banks, state shares make up a high percentage of the total; in the case of China Merchants Bank, 39.13% of the outstanding equity is in the form of state shares, and 42.07% is in the form of LP shares. In many cases, the key decisions affecting bank operations are still made by the state; ordinary shareholders have little input into management, and the oversight of bank operations is inadequate.

A second issue is that the percentage of outstanding shares that can be freely traded on the stock market is too low. Share liquidity is a serious problem for the Chinese stock market; the fact that different types of shares have different trading restrictions imposed on them creates a situation where shareholders' rights, dividends and share prices vary within the same listed company. As a result, the interests of different types of shareholder may conflict; there have been many cases where the holders of non-liquid shares have used their control over the company's operations in ways harmful to the interests of shareholders holding liquid shares. Of the five Chinese banks that have implemented IPOs, 72.43% of the outstanding equity of Shenzhen Development Bank is in the form of liquid shares, but for all of the other four banks the percentage is in the range of 20–30%.

A third issue relates to the low percentage of directorships held by executive directors and the small size of directors' and auditors' shares in their own company. If the share of seats on the board held by non-executive directors increases, this can lead to conflict and prevent effective collaboration between directors. None of the five Chinese banks that have been listed on the stock market has more than three executive directors; even at Shenzhen Development Bank, executive directors hold only 21.43% of the seats on the board, which is below the level specified by the People's Bank of China in its guidelines for the governance of shareholding commercial banks. Furthermore, while Shenzhen Development Bank's directors hold 0.04% of the company's equity between them, for all of the other four listed banks the percentage is zero; the price of the company's shares cannot provide any incentive with respect to these directors' actions. The situation with auditors is very similar; only at Shenzhen Development Bank and China Minsheng Bank do the bank's auditors hold any shares in the bank at all, and even then the shares of total equity held by the auditors are just 0.003% and 0.0003%, respectively.

Fourthly, listed Chinese banks generally lack the kind of mechanisms that could provide meaningful incentives for their managers.[4] None of the five listed banks has managers with shares in their own bank; there is thus little reason for managers to exert themselves to boost the bank's performance and share price. A fifth factor is that the internal auditing departments within Chinese banks are usually not given sufficient autonomy.

3. Limited financial innovation capabilities

China's listed banks have tended to use the funds raised through IPOs to purchase fixed assets, increase their capitalization or open new branches; they have not employed the funds to adopt new technologies or new management methods. Expansion through the opening of new branches and the recruitment of extra staff is a highly old-fashioned way of building up a business, one that is unlikely to produce significant results. At the same time, attempts to boost non-interest revenue require the expenditure of large sums of money, and the benefits take a long time to make themselves felt. Under these circumstances, when listed Chinese banks have attempted to innovate, the resulting increase in revenue has generally been far smaller than the increased costs, causing overall operational performance to decline.

4. Insufficient emphasis on risk control

For a commercial bank, risk control capability is one of the most important sources of core competitiveness; possession of a comprehensive risk control system is vital if a bank is to be able to compete effectively. So far, most Chinese commercial banks have failed to establish proper risk control mechanisms; they have neither the early warning systems nor the control capabilities needed for dealing with credit risk, systemic risk, risk relating to the quality of human resources or risk relating to financial innovation. This situation has had a negative impact on banks' operational performance. Cases such as the RMB1.4 billion corruption scandal at the China Construction Bank in 2005 and the RMB1 billion fraud at the Bank of China in the same year show that Chinese banks still have a long way to go in this area.

Tables 4 and 5 show the empirical results of the simplified model for the ROA and ROE, respectively. Again, the Hausman test value indicates that the random effects model could be rejected in favor of the fixed effects model. As can be seen from Tables 4 and 5, the estimated coefficient of PL is shown to be negative, which implies that the operational performance (ROA and ROE) of listed banks is inferior to that of unlisted banks. The effect

Table 4. Empirical results of Equation (4) for ROA, 1996–2004.

	Fixed Effects	Random Effects
PL	–44.251 (–4.749)***	0.108 (0.415)
PLA	–0.049 (–1.056)	–0.012 (–0.394)
Age	–0.423 (–4.636)***	–0.022 (–0.813)
RNI	–0.008 (–2.172)**	–0.007 (–1.940)*
Scale	–0.461 (–3.386)***	–0.342 (–4.640)***
PCG	5.921 (5.194)***	0.381 (0.803)
CPR	0.0004 (–0.062)	0.014 (2.222)**
Adjusted R^2	0.630	0.328
F test	6.1402 (Fixed effects model is acceptable)	
Hausman test	CHISQ (5) =38.097*** P-value=[0.000] (Fixed effects model is acceptable)	

Notes: t-statistics are in parentheses. ***Indicates significance at the 1% level; **Indicates significance at the 5% level; *Indicates significance at the 10% level.

Table 5. Empirical results of Equation (4) for ROE, 1996–2004.

	Fixed Effects	Random Effects
PL	–854.837 (–4.821)***	8.478 (1.904)*
PLA	0.909 (1.028)	0.732 (1.291)
Age	–8.447 (–4.867)***	0.065 (0.136)
RNI	–0.103 (–1.496)	–0.104 (–1.603)
Scale	–0.705 (–0.272)	–2.577 (–1.944)*
PCG	108.443 (5.000)***	5.682 (0.664)
CPR	–0.165 (–1.289)	0.086 (0.725)
Adjusted R^2	0.599	0.362
F test	5.1156 (Fixed effects model is acceptable)	
Hausman test	CHISQ (5)=31.854*** P-value=[0.000] (Fixed effects model is acceptable)	

Notes: t-statistics are in parentheses. ***Indicates significance at the 1% level; *Indicates significance at the 10% level.

over time of the IPO (PLA) is shown to be insignificant in the simplified model. Similar to the results shown in Table 2, the age of the bank (Age), the ratio of non-interest income (RNI), the size of the banks in terms of assets (Scale) and per capita GDP all have a significant effect on the ROA. Furthermore, the age of the bank (Age) and per capita GDP have a significant effect at the 1% significance level on the ROE.

Indeed, the post-IPO operating performances of China's newly partially privatized banks have received a lot of attention. Recently, the China Construction Bank posted a net profit of RMB57 billion in the first nine months of 2007. As of 30 September 2007, the bank's bad loan ratio stood at 2.83%. ICBC reported a 66% jump in net profits to RMB64.1 billion in its first nine months of 2007. The non-performing loan ratio decreased from 3.79% to 3.06% from the end of 2006 to the end of the third quarter of 2007. The Bank of China's net profit based on the international accounting rules in the first nine months rose 40% to RMB45.5 billion. It was also acknowledged that the non-performing loan ratio continued to drop, without the exact figure being disclosed.

It seems that these newly partially privatized banks had made much progress after only one year of being listed. However, it is necessary to observe their performance over a longer period to judge the effects of the IPO for China's state-owned banks. At the same time, it should not be denied that there are still many challenges and difficulties facing the development of state-owned banks. For example, after being listed, state-owned banks will have to face new requirements in relation to supervisory rules and information disclosure. One of the major tasks of state-owned banks is to maintain sustainable profitability. Enhancing risk control capacity is also the key to the future reform of the state-owned banks. The quality of a bank lies in its core competitiveness, profitability, value-creating ability, and in its customer service capabilities. In these respects, Chinese banks are still lagging behind international world-class banks.

4. Conclusions

As part of its WTO pre-accession commitments, China undertook to complete the opening up of its financial markets by the end of 2006, a move that would inevitably lead to a heightening of market competition. To respond to the stiff competition, China has focused on restructuring the big four banks as shareholding commercial banks and on having them listed on the stock market, which represents a major step forward in the modernization of the banking sector.

As to whether stock market listings help to improve the operational performance of China's banks, it is interesting to note the following differences that appear in the stock market listing response to China's banking operational performance. First, the operational performance of listed banks is inferior to that of unlisted banks. Second, the implementation of IPOs by Chinese banks has had a significant positive impact on the ROA. Third, although an improvement in the ROA can be seen during the period after the listing, ROA performance worsens over time. Fourth, the longer a bank has been in existence, the worse its ROA or ROE performance becomes. Fifth, traditional interest income still accounts for by far the largest share of Chinese banks' operating revenue. Where banks have attempted to increase non-interest income, their limited technical capabilities and unsatisfactory management systems have led to an increase in indirect costs. The failure to achieve reductions in the employee wage bill or in expenditure on hardware facilities has had a pronounced negative impact on these banks' operational performance. Finally, the larger the size of the bank's assets, the worse its ROA performance has been. The main reason a high level of assets is associated with a lower ROA is that an increase in assets means higher indirect

costs (increased personnel costs due to over-manning, for example). These problems are particularly prevalent in the big four state-owned banks with their enormous branch networks; as a result, the last few years have not seen any significant improvement in their operational performance.

The results obtained from these empirical tests have the following important implications for the operational performance of China's banking sector. The quality of listed banks needs to be improved in order to strengthen their guiding position in the market. Listed banks must also undertake a thorough overhaul of their management mechanism and establish efficient corporate governance. This includes accelerating the reform of the board of directors, developing sound risk management and internal controls, improving disclosure and supervision of insider and related party transactions, improving the independent audit committee and the internal audit function, improving the legal environment for mergers and acquisitions, and improving the independent judiciary and legal culture in China. Moreover, financial innovation has been one of the main driving forces behind the continued growth of the commercial banks. Chinese banks also need to strengthen their ability to innovate, so that they can enhance their competitiveness.

Notes

1. On 25 September 2007, China Construction Bank made an initial public offering of RMB57.12 billion (US$7.6 billion) on the Shanghai stock exchange.
2. If China's economy continues to grow as rapidly as it has been doing, businesses in all sectors – including the banking sector – should see a gradual improvement in operational performance. For a deliberating discussion on the operational performance of listed companies, see Chen and Shih (2002).
3. Groenewold *et al*. (2003) pointed out that stock market efficiency suffered when banks were excluded from the stock market in 1996 but efficiency improved when they were re-admitted in early 2000.
4. The empirical findings of Wang (2005) suggested that agency conflicts, management and large shareholders' expropriations co-exist to influence Chinese IPOs.

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