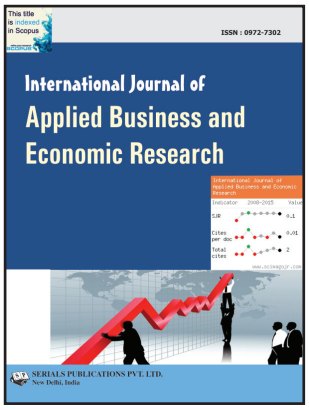

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Characteristics of Chinese Commercial Banks and Their Reaction Capabilities in the Financial Crisis

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ABSTRACT

In this study, I selected 280 Chinese commercial banks as research samples and analyzed the main characteristics that positively influenced the banks in overcoming the global financial crisis in 2008. To this end, using the Malmquist index productivity analysis, I segmented the selected sample banks into two groups: one group showed good productivity for both pre-crisis period and post-crisis period in common, and the other group showed poor productivity for both periods. Then I compared the profitability determinants between the two groups through a panel analysis. From the major findings of the analysis, it was identified in the banks which sustained the higher productivity that the higher foreign capital inflow and higher non-interest revenue from diversification had positive impacts on bank profitability, which enables the banks to overcome the financial crisis. In particular, it was found that the foreign capital inflow was very useful for overcoming the financial crisis as well as improving the efficiency and productivity. This implies that, since most of the Chinese commercial banks have been growing under the simple deposit-loan-centric earning structure, the Chinese commercial banks would be able to sustain survival and growth only if they transformed the business structure into a more diversified one in the midst of the opening and universalization trends of the global financial markets.

Keywords: Chinese Commercial Banks, Global Financial Crisis, Response Capability, Panel Analysis, Data Envelopment Analysis, Malmquist Index.

1. INTRODUCTION

China executed the implementation of the financial market opening at the promised level that it set at the end of 2006, five years after it joined the World Trade Organization (WTO)[1]. Some questions were raised on the other hand relating to why the Chinese government was so active in the financial market opening and whether the financial market opening could exert positive impacts on Chinese economic developments or not. It was pointed out that, when opening the financial market to the foreign investors, the benefit is the expected development of the financial and economic sector through the inflows of foreign capital, while the drawback is the risk that the control power of foreign capitals over the domestic economy might be accelerated. As if proving this point, the Chinese financial market didn't avoid the impacts of the global financial crisis in 2008, and in Chinese commercial banks, the core of the Chinese financial markets, business performance deteriorated significantly in 2009. However, Chinese commercial banks recovered the business performance to the pre-crisis level, and the world took note of their crisis management capabilities. With the rise of the criticism that inadequate financial regulation and financial supervision caused the global financial crisis, the moves to strengthen financial regulation were emerging all around the world, and China also seemed to slow down the pace of the financial market's opening and deregulation. From the global financial crisis, China obtained a lesson that establishing financial system and supervision system in a more organized manner is more important than speeding up the opening prematurely, so it has slowed down its opening speed. Much attention has been paid to this phenomenon in academia, while research results have been published surrounding how the government intervention in the financial industry affected the banks in overcoming the crisis and improving the business performance.

However, empirical studies as to what characteristics of Chinese commercial banks exerted effective impacts on their recovery from the global financial crisis are very limited. Under the current situation in which foreign capital entry is being actively deployed, especially with the financial market opening in the 2000s, it is not easy to conduct the study on whether foreign capital inflows really played a positive role in the recovery of Chinese commercial bank from the crisis.

This study is focused on identifying the determinants of the Chinese commercial banks' reaction abilities in their recovery from the crisis, differentiated from most of the prior researches with a focus on changes in Chinese financial institutions or Chinese government intervention in the banking industry. On the other hand, from the review results of profitability trends in the pre-crisis and post-crisis periods, it is identified that, while some Chinese commercial banks which had recorded good profitability became significantly unprofitable, other commercial banks with lower profitability became more profitable due to fundamental changes in the competition paradigm after the financial crisis. In addition, it was identified that some commercial banks remained unchanged in their existing higher or lower earning structures, regardless of the financial crisis. Relating to the Chinese commercial banks, this study is aiming to elucidate the specific characteristics of the banks that positively influenced the banks in overcoming the global financial crisis in 2008. In addition, whether foreign capital inflows into the Chinese banks, actively underway until recently, acted as a positive determinant in improving the bank productivity and helping the banks overcome the crisis will be discussed in detail.

[1] China satisfied its commitments, exceeding the original promise of market opening levels in December 2006, when the grace period of the financial market opening was over. Accordingly, China basically eliminated the restrictions imposed on foreign financial institutions relating to business areas, yuan-based business, installation of branch office, etc. However, the restriction on the subsidiary establishment or the equity acquisition relating to the Chinese financial institutions still existed and discrimination existed in some areas relating to yuan-based business.

The configuration of the study is as follows. In Chapter 2, the major prior studies are examined, on the basis of which research model and hypothesis are derived. In Chapter 3, sampling and research methods are described. In Chapter 4, the major findings are summarized and interpreted. Finally, in Chapter 5, the implications of the study in policy setting and its limitations will be summarized.

2. PRIOR STUDIES AND RESEARCH MODEL

2.1. Prior Studies

2.1.1. Impacts of the Financial Crisis on Bank Management

The world has undergone a foreign exchange crisis in 1997 and the financial crisis in 2008 since significant economic growth began in the 1960s. While several research results have been published with regard to the impacts that these economic crises exerted on the whole financial industry, the current specific empirical research on what kind of impacts the crises exerted specifically on the performances of the individual banks are insufficient.

First, taking a look at other major papers that dealt with the impacts of the global financial crisis on the business performance of the bank, Park, Suh and Hahm (2010) examined the impacts of the global financial crisis on the business performance of the bank, using data from 8,404 banks from 1991 to 2008 relating to the two financial crises. As a result, the researchers concluded that bank size expansion strategy, loan expansion strategy, and revenue diversification strategy with increasing non-interest income have a positive effect on profitability. Shin (2012) analyzed the impacts of the global financial crisis and project financing loan on bank profitability with regard to savings banks in Korea. Based on the results of the empirical analysis conducted using 2006-2011 data of 94 sampled banks, it was found that the profitability of the savings banks was deteriorated, where the insolvent project financing loans were identified to contribute the most. In addition, he argued that, although the global financial crisis occurred in 2008, the major influences were beginning to be expressed in 2010, and the bank profitability should be improved by expanding the non-interest revenue base through diversification, etc.

With a focus on studies on the relatedness between global financial crisis and stock return, Beltratti and Stulz (2009) analyzed the data of 98 large banks in 20 countries sampled from the financial crisis period (July 2007 to December 2008) and the period immediately following the bankruptcy of Lehman Brothers (September 12, 2008 to October 10, 2008). From the summarized results of the study, first, it was identified that the bank stock returns were related to balance sheet (B/S) characteristics, governance structure, and regulatory level before the crisis. Most banks with good returns in 2006 became worse during the financial crisis period, while the banks with higher capital adequacy ratios and higher amounts of deposits showed relatively better returns. Third, the banks retaining more current assets and loans showed better returns for the period of September 12, 2008, to October 10, 2008, shortly after the Lehman Brothers bankruptcy. Akhigbea, Madurab, and Marciniakb (2012) analyzed the factors affecting the bank stock return with regard to 288 US banks for the period of 116 weeks before the financial crisis and 94 weeks during the financial crisis. As a result of the analysis, risk-based capital requirements were used for asset quality, which supported the capital signaling hypothesis. While equity was recognized as a shock absorber when asset risks were high, it was shown to be not sufficient to cover bank losses caused by holding the risky assets at excessively high levels during the financial crisis period. In addition, it was identified that larger size lowered operating

income and stock price performance, while lower dependence on fee income in the pre-crisis period helped corporations overcome the crisis.

Choi and Oh (2010), who had been studying the survival rate of the banks, analyzed the factors affecting the bank failures with regard to 514 banks in 8 Southeast Asian countries (Korea, Indonesia, Malaysia, Philippines, Thailand, Singapore, Taiwan, and Hong Kong) during the period of the Asian foreign exchange crisis. From the results of the analysis, it was identified that the higher the capital ratio, the higher the liquidity, and the higher the return on asset, the lower the probability of bank failure. Berger and Bouwman (2013) analyzed the impacts that the equity had on the bank performance (i.e. bank survival and market share) with regard to US banks during the global financial crisis. Regarding the analysis periods of 1984 to 2010, he defined the two banking crises and the three market crises while distinguishing the rest of the periods as normal periods. From the result of the analysis, it was shown that the equity improved the performance of the small banks throughout the whole periods while improving the performance of the large banks only during the crisis periods. Many countries executed a variety of intervention policies at the government level for the recovery of the financial system after the global financial crisis.

Beltratti and Stulz (2009) examined the relatedness of pre-crisis bank performance with bank-level governance, country-level governance, and country-level regulation as well as the relatedness of the bank balance sheet with profitability characteristics. From the result of the analysis, it was argued that, while the banks with shareholder-friendly boards exhibited worse returns, the banks in the countries with more strict capital requirement regulations and independent supervisors showed better results.

Ding, Wu, and Chang (2012) examined the dynamic changes of banks' financial performances in the five major economic center countries (Japan, Korea, Hong Kong, Singapore, and Taiwan) prior to and posterior to the government intervention. From the result of the analysis, it was identified that the solvency, credit risk, and profitability index relating to the bank financial performance were improved on average after the government intervention. In particular, it was found that the government intervention in Hong Kong more strongly affected the bank financial performance index.

2.1.2. Efficiency and Profitability Determinants in Chinese Commercial Banks

Prior studies that have verified the efficiency and profitability determinants of Chinese commercial banks so far are not abundant, but are summarized as follows. First, taking a look at the studies related to the profitability determinants of the Chinese commercial banks, Park and Liu (2007) conducted a comparison analysis on the profitability determinants of 19 banks, including 9 Korean banks and 10 Chinese banks with regard to the periods of 1998 to 2005. Non-performing loans, the loan-to-deposit margin, fee income, and capital adequacy ratio were identified as factors affecting the profitability of the Korean banks while size, non-performing loans, and loan-to-deposit margin were identified as factors affecting the profitability of the Chinese banks.

Heffernan and Fu (2008), who analyzed profitability with the addition of the macro variables, set the following four indexes as dependent variables by utilizing the 1996-2006 data of 76 Chinese banks: return on average assets (ROAA), return on average equity (ROAE), economic value added (EVA), and net interest margin (NIM). Although variable significance was shown differently between the dependent variables, in general, it was identified that loan loss reserves/gross loans and real gross domestic product (GDP)

growth) affected the market positively, while cost to income ratio and unemployment affected it negatively. Su (2010) conducted further analysis with the addition of GDP and inflation rate variables as the economic situation variable on the basis of Park and Liu (2007). From the results of the analysis with the 1999-2009 data of 13 Chinese commercial banks, it was indentified that the larger the bank size, the higher the BIS ratio (capital adequacy ratio), the higher loan-to-deposit margin, and the higher inflation rate generated by the higher profitability. García-Herrero, Gavilá, and Santabárbara (2009) analyzed the factors affecting the bank profitability with the 1997-2004 data of 87 Chinese banks. Profitability was measured by pre-provision profit and return on asset (ROA). From the results of the analysis with these two variables as dependent variables, it was indentified that the bank with good capital adequacy showed higher profitability, while higher variation in inflation and real interest rates on loans reduced the profitability. Sufian and Habibullah (2012) analyzed whether or not economic globalization affected ROA, a bank management performance index, using 2000-2007 data of the Chinese commercial banks. They used six globalization indexes as proxy variables that Dreher (2007) invented. It was indentified that economic globalization positively affected bank performance while it was found that the more equity, the lower non-interest expense, the larger GDP, and the higher asset concentration ratio of the three largest banks set as independent variables exerted positive impacts on the bank profit.

Liang, Xu, and Jiraporn (2013) examined the impacts that the size, composition, and functioning of the board had on the bank performance and asset quality of the Chinese banks. From the results of the empirical analysis, the number of board meetings and the proportion of independent directors positively affected the bank performance and asset quality, while the higher board size and boards' political connection had a negative impact on bank performance and asset quality. In addition, the management performances were shown to be higher as well when the capital ratio as a control variable was higher, while the negative impacts were observed when the majority shareholders were government agencies or foreign investors.

Sul and Kwon (2012) analyzed the efficiency determinants. They utilized a stochastic frontier approach to analyze the efficiency determinants of the Chinese commercial banks with foreign capital inflows in 2003 to 2010. From the results, it was identified in the 1st stage stochastic frontier approach that the higher equity ratio and the lower expense/liquid asset ratio affected bank profitability positively. In the second stage, which included the validation results of the bank profitability, it was found that the higher inflow ratio of foreign capital and the lower value in the square of the foreign capital inflow ratio generated more positive effects for the improvements of the bank efficiency with the capital inflow. Zhu and Li (2012), who conducted the comparison analysis of the factors affecting the efficiency of the Korean banks and Chinese banks, selected 10 Chinese national commercial banks and 5 equity commercial banks with 2004-2010 as the analysis periods. From the results of the analysis, it was indentified that the state-owned commercial bank dummy, loans-to-deposit ratio, ratio of non-performing loans significantly influenced the bank efficiency for the Chinese banks. Lee and Chih (2013), who analyzed the impacts of financial regulation on the bank default risk and profit efficiency, stated that provision coverage ratio regulated by the China Banking Regulatory Commission (CBRC) and a lower cost-to-income ratio reduced the bank failure risks, where only the lower cost-to-income ratio was related to the higher efficiency. In addition, it was shown that the lower the loan-to-deposit ratio was, the higher capital adequacy ratio was, and the higher leverage ratio improved the efficiency and reduced the failure risks more in the smaller banks.

Looking into the prior studies verifying the efficiency and profitability of the Chinese commercial banks, CAMEL variables, macro variables, and variables associated with ownership and governance structures were most often used. However, this study is differentiated from the existing prior studies in that the prior studies that verified the relatedness between the characteristics of the Chinese commercial banks and global financial crises can be hardly seen.

2.2. Model and Hypothesis

The global financial crisis in 2008 rapidly worsened the performance indicators of the whole financial market as well as the major financial asset, financial institutions around the world, due to the sub-prime mortgage crisis and the credit crunch. Each country executed a variety of reaction policies to overcome the global financial crisis, and China also mobilized all measures including government-level fiscal supports, such as prime interest rate lowering, bank liquidity enrichment, domestic demand stimulation, as well as real estate policy measures for the stabilization of the financial markets. Although the Chinese financial market showed a relatively stable state compared to other countries during the crisis period, the worsening profitability of the banks could not be avoided in the following year.

Although Chinese commercial banks recovered their profitability and overcame the financial crisis in a relatively short period of time, it was identified that banks with good profitability became less profitable while banks with a vulnerable profit structure became stronger with regard to competitiveness, due to changes in the competition paradigm. It was found that some banks sustained their existing earning structures, whether lower or higher, regardless of the financial crisis. What really are the determinants that significantly affected the changes in the bank competitiveness with these paradigm shift triggered by the global financial crisis? In this study, I will verify the cause through the empirical analysis while assuming that it came from the differences in resource management and the corporate strategy of the Chinese commercial banks. Since the prior studies dealing with these topics were limited in number, as noted earlier, this study employed an explorative approach.

In this study, the following model will be introduced to distinguish the Chinese commercial bank with the higher performances of those with lower performances prior and posterior to the global financial crisis. The full sample periods were 2006-2012, which was divided into two periods, where 2006-2008 was classified as pre-crisis period and 2010-2012 as the post-crisis period. The financial crisis periods were set up like this because the impact of the global financial crisis was reflected mostly in 2009, so the year 2009 was only used as the separating point and excluded from the sample periods. The sample periods were segmented into three years prior to the crisis as the pre-crisis period and the three years after the crisis as the post-crisis period. Since then, Malmquist index analyses were conducted to examine the productivity changes of the Chinese commercial banks in each period, on the basis of which the banks were divided into two groups, the H group and the L group. The H group included the banks that showed productivity improvement, while the L group was composed of the rest of the banks that demonstrated a decline in productivity. For each period, classification of the H and L groups is based on the Malmquist index 1. A Malmquist index higher than 1 indicates that productivity has increased compared to the previous period, and a Malmquist index lower than 1 indicates that productivity has decreased compared to the previous period.

Through this process, a total of four groups could be composed as in Figure 41.1, and out of these four groups, the HH and LL groups were set as the objects to be compared to each other in this study. Specifically, based on the productivity changes in the pre-crisis (2006-2009) and post-crisis (2010-2012) periods, the group that showed a productivity increase in both the pre-crisis and post-crisis periods was set as the High-High (HH) group, while the group that showed a productivity decline in both the pre-crisis and post-crisis periods was set as the Low-Low (LL) group. That is, the banks belonging to the HH group were regarded as superior banks, demonstrating competitiveness because they showed productivity improvements in the pre-crisis period. In addition, it was interpreted that the HH group was excellent in the capability of overcoming the crisis because it showed productivity improvements in the post-crisis period. On the other hand, the banks belonging to the LL group showed a decline in productivity in the post-crisis period as well as in the pre-crisis period, which implies that there were the observations with vulnerability in crisis management capability as well as inferior competitiveness. Taken together, the HH group was a collection of the Chinese commercial banks that had excellent reaction capability in the global financial crisis with superior competitiveness, while the LL group was a set of banks that showed insufficient reaction capability with inferior competitiveness.

In this study, it is assumed that both the productivity of the pre-crisis period and post-crisis period were shown differently between the banks belonging to HH group and the banks belonging to LL group because the management resources and management characteristics differed between the two group banks.

Therefore, I explored the management characteristics of the Chinese commercial banks that were more robust in the financial crisis by identifying the profitability determinants for each individual group and then compared the determinants between the two groups. In order to validate these, I set the hypothesis that the profitability determinants might differ between the two groups as shown below.

Hypothesis – the profitability determinants might differ between HH group and LL Group.

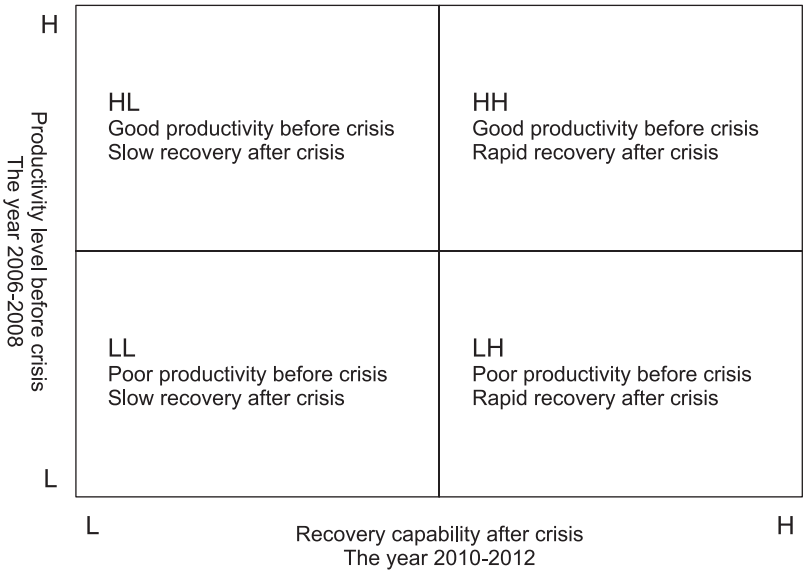

Figure 41.1: Research Model

3. SAMPLE AND METHODOLOGY

3.1. Sample

In this study, sample banks were limited to the Chinese commercial banks that performed business in the first and second grade cities[22]. That is, sample homogenization could be achieved by eliminating the exogenous factors through the control of the size differences between banks and the economic level differences between regions. The source of the Chinese commercial bank financial statements used in this study was BankScope, and whether or not the foreign capitals flowed into each sample bank was discerned with the reference and analysis of the data collected from the following three sources:

1. BankScope data for equity inflow at the first stage,
2. Annual reports collected from the website of each sample bank at the second stage,
3. Finally, portals such as Baidu (www.baidu.com) and Google China (www.google.cn).

The analysis results were summarized and included in the foreign capital inflow category.

The analysis period in the study was set as starting in 2006, three years before the Chinese commercial banks began to be influenced by the global financial crisis, ending in 2012, three years after the banks were affected by the crisis. While the number of the sample elements was 336 for the whole analysis period, the actual number of sample elements examined in the empirical analysis of Chapter 4 was reduced to 280 in some variables due to missing data.

3.2. Methodology

In order to identify whether the productivity was improved or not for the two periods – the per-crisis period and the post-crisis period – the sample banks are segmented into the H group and L group for each period, as defined earlier, after conducting the data envelopment analysis (DEA)-based Malmquist index analysis for each sample bank. Thus, finally, the sample banks were segmented into a total of four specific groups (HH group, HL Group, LH Group, LL group), since two analysis periods were crossed over as shown in Figure 41.1. Out of these four groups, the profitability determinants were verified through the application of the panel analysis to the HH group and the LL group, respectively. The methodologies adopted in the study were the DEA-based Malmquist index analysis and panel analysis.

3.2.1. Analysis of Productivity Change using Malmquist Index

The Malmquist index analysis facilitaed the evaluation of the productivity improvements of the banks between two points of time. Sample periods were segmented into two periods: the pre-crisis period (2006-2008) and the post-crisis period (2010-2012), with 2009 as the basis year when the Chinese commercial banks were under the global financial crisis. Productivity improvements of each decision making unit (DMU) were measured between two points during each period through the Malmquist index analysis. Given the production possibility set at the time point of t, the output-based Malmquist index can be defined as in Eq. (1) below.

[2] According to a report published by the Beijing Academy of Social Sciences (BASS, 2009), the Chinese government designated 35 major cities as so-called "headquarters" based on their level of economic development. Among them, there are four Class 1 cities of the highest level, including Beijing, Shanghai, Guangzhou, and Shenzhen. The eight second-highest Class 2 cities are Hangzhou, Nanjing, Tianjin, Chengdu, Wuhan, Qingdao, Ningbo, and Xiamen.

$$M_0^t(x^t, y^t, x^{t+1}, y^{t+1}) = \frac{D_0^t(x^{t+1}, y^{t+1})}{D_0^t(x^t, y^t)} \quad (1)$$

The production possibility set defined at the time point of $t + 1$ using output-based Malmquist index is shown in Eq. (2) below.

$$M_0^{t+1}(x^t, y^t, x^{t+1}, y^{t+1}) = \frac{D_0^{t+1}(x^{t+1}, y^{t+1})}{D_0^{t+1}(x^t, y^t)} \quad (2)$$

A malmquist index larger than 1 indicates that the productivity increased from time point t to time point $t + 1$. Conversely, A Malmquist index smaller than 1 means that the productivity decreased from time point t to time point $t + 1$. A geometrically averaged Malmquist index defined as the geometric means between Malmquist indexes of the two time points is shown below in Eq. (3).

$$M_0^{t,t+1}(x^t, y^t, x^{t+1}, y^{t+1}) = [M_0^t \cdot M_0^{t+1}]^{1/2} = \left[\frac{D_0^t(x^{t+1}, y^{t+1})}{D_0^t(x^t, y^t)} \cdot \frac{D_0^{t+1}(x^{t+1}, y^{t+1})}{D_0^{t+1}(x^t, y^t)}\right]^{1/2} \quad (3)$$

Meanwhile, Paradi *et. al.*, (2004) proposed three approaches for the bank profitability analysis: production approach, profitability approach, and intermediation approach. Production approach sees the bank as an entity that generates deposits and loans with assets and labor in input, while the profitability approach is focused on how to generate revenue by inputting assets and labor. On the other hand, the intermediation approach is focused on how efficiently the deposits are converted into loans. The commercial bank as the main axis of the Chinese banking industry is still on the way toward its mature stage, and its main operation is identified as deposits and loans. Thus, it is reasonable to adopt the view of the intermediation approach for the analysis because it has a simple business structure to generate revenues through the process of taking deposits from the customers and extending loans. Therefore, total assets, indirect cost, and total deposits are set as the input variables, while operating income and loans are set as output variables. Which group the sample bank belongs to among the 2X2 = 4 groups (HH group, HL group, LH group, LL group) is determined through the measurement of the DMU productivity change between the two analysis periods using the Malmquist index.

3.2.2. Panel Analysis of Profitability Determinants

The data extracted to analyze profitability determinants in the study are the panel data composed of 96 sample banks in the HH group and 82 sample banks in the LL group. As far as the panel data is concerned, it is more relevant to apply the panel analysis than the ordinary least square (OLS) method to the data. That is to say, when firm-specific effects or time-specific effects exist within samples, panel analysis should be used because it is not possible to obtain the effective estimates by using the OLS estimation. Thus, in this study, the population is estimated for the panel analysis of profitability determinants through the formula presented below (4).

$$y_{it} = x_{it}\beta + c_i + \varepsilon_{it} \quad i = 1, ..., N, t = 1 \quad (4)$$

In formula (4), it is assumed that y_{it} is a dependent variable vector, x_{it} is an independent variable vector, β is a parameter vector representing a population linear relationship between an independent variable and a

dependent variable, $\in_{it}$ is a time-series cross-section idiosyncratic error term, and c_i is an unobserved effect as a cross-section or time-series individual specific effect.

Incidentally, if an individual specific effect c_i is a random variable having a variance and satisfying the assumption that the covariance of the error term with the independent variable and the individual specific effect (c_i) is 0 ($E[\in_{it}|x_{it}, c_i] = 0$), the covariance-variance matrix of the error term becomes $\sigma^2_{\in} I_T + \sigma^2_{\in} j T^{j'} T$, rather than $\sigma^2_{\in} I_T$ so the least square estimation value cannot satisfy the coherence. In this case, the covariance-variance matrix of the error term needs to be redefined as $\sigma^2_{\in} I_T + \sigma^2_{\in} j T^{j'} T = \Omega$, and then, a random effect estimation constituting a generalized least squares estimator is utilized.

$$\widehat{\beta_{RE}} = \left(\sum_{i=1}^{N} X_i' \widehat{\Omega}^{-1} X_i\right)^{-1} \left(\sum_{i=1}^{N} X_i' \widehat{\Omega}^{-1} Y_i\right) \tag{5}$$

However, when the data structure cannot satisfy the assumption that the covariance-variance of the error term with the independent variable and individual specific effect (c_i) is 0 (that is, $E[\in_{it}|x, c_i] \neq 0$) or the independent variable has endogeneity with c_i, the random effect estimation value becomes one that cannot satisfy the coherence, so the irrelevant estimation value would be presented as well. At this time, it is desirable that one use a fixed effect estimation, where the sample mean should be considered as in the below formula (6).

$$T^{-1} \sum_{i=1}^{T} Y_{it} = T^{-1} \sum_{i=1}^{T} X_{it} \beta + c_i + T^{-1} \sum_{i=1}^{T} \varepsilon_{it} \Rightarrow \overline{y_i} = \overline{x_i} \beta + c_i + \overline{\in_i} \tag{6}$$

The difference between formula (4) and formula (6) can be expressed as in the below formula (7).

$$T^{-1} \times T y_{it} - \overline{y_i} = (x_{it} - \overline{x_i}) \beta + c_i - c_i + \in_{it} + \overline{\in_i} \Rightarrow \ddot{y}_{it} = \ddot{x}_{it} \beta + \ddot{\in}_{it} \tag{7}$$

Formula (7) is not different from formula (4) in terms of the parameter vector to be estimated, but the expression is the form in which the individual specific effect (c_i) is removed so the least square estimation value can satisfy the coherence.

When estimating the panel model, whether to select the generalized least squares (GLS) or fixed effect estimation or random effect estimation are determined, depending on the presence of c_i. It is relevant to use the random effect or fixed effect when a unobservable c_i is present, which can be verified by the Breusch-Pagan Lagrange multiplier test. The null hypothesis of the Breusch-Pagan Lagrange multiplier test is $H_0 = \sigma^2_c = 0$, in which case the least square estimation value can be used when the null hypothesis cannot be rejected. Next, it is more relevant to use the random effect or fixed effect than the least square estimation when the unobservable c_i is present, and which is more desirable to choose between the two can be verified by using Hausman test statistics (Hausman, 1978).

The choice between the random effect estimation and the fixed effect estimation is determined depending on the endogeneity of c_i; that is, whether $E[\in_{it}|X_{it}, c_i] \neq 0$ is true or not. The random effect estimation is more relevant when $E[\in_{it}|X_{it}, c_i] = 0$ is not true, while the fixed effect estimation is more relevant when $E[\in_{it}|X_{it}, c_i] = 0$ is true. This can be discerned through formula (8).

$$H = (\widehat{\beta_{FE}} - \widehat{\beta_{RE}})' [\widehat{Var}(\widehat{\beta_{FE}}) - \widehat{Var}(\widehat{\beta_{RE}})]^{-1} (\widehat{\beta_{FE}} - \widehat{\beta_{RE}}) \tag{8}$$

$\widehat{\beta_{FE}}$ is the estimator in the fixed effect model, and $\widehat{Var}(\widehat{\beta_{FE}})$ is the matrix of the standard errors as the variance of the estimator in the fixed effect model in formula (8), in which subscript RE relates to the

estimators of the random effect model. In the Hausman test, since the null hypothesis is to choose the random effect and the alternative hypothesis is to choose the fixed effect, it is appropriate to use a random effects model if you cannot reject the null hypothesis.

3.3. Defining Variables

In this study, in order to analyze the profitability determinants of the Chinese commercial banks, I conducted a panel analysis which can reflect the bank characteristics and time characteristics, in which estimations were made using formula (9). Detailed description and expected signs for the dependent and independent variables are summarized in Table 41.1, and DEA-Solver and Stata 12 will be used for the analysis.

$$\text{ROA} = \alpha + \beta_1 \text{ FIC dummy} + \beta_2 \text{ capital adquacy} + \beta_3 \text{ asset quality} + \beta_4 \text{ management adquacy} + \beta_5 \text{ earning power} + \beta_6 \text{ liquidity} + \beta_7 \text{ growth} + \beta_8 \text{ earning ratio} + \beta_6 \text{ size} + \in \quad (9)$$

The return on assets (ROA) was used as the dependent variable representing the profitability of the Chinese commercial banks, while a foreign capital inflow dummy (FCI dummy), a CAMEL variable that can reflect the Chinese bank characteristics, and a variable that can represent the bank earning structure were used as the independent variables. Bank size was used as the controlled variable.

Table 41.1
Description of Panel Variables

CL.	*Variables*	*Description on Variables*	*Expected Sign*
Dependent variables	Profitability	ROA = (net income after taxes/total assets) × 100	
Independent variables	FCI dummy	Foreign capital inflow bank = 1, non-foreign capital inflow bank = 0	(+)
	Capital adequacy	Tier1 capital ratio = (Core equity capital /risk-weighted assets) × 100	(+)
	Asset quality	Loan loss provision ratio=loan loss provision/net interest revenue × 100	(–)
	Management adequacy	Cost to income ratio = operating expenses/operating income × 100	(–)
	Earning power	Net interest margin = interest income-interest expense	(+)
	Liquidity	Liquid assets ratio = [liquid assets/(Deposits & short-term borrowings)] × 100	(–)
	Growth	Growth rate of deposit = [(asset of t_1 – asset of t_0)/(asset of t_0)] × 100	(+)
	Earning ratio	Non-interest operating income ratio = (non-interest operating income/ operating income) × 100	(+)
Controlled variable	Size	ln (assets)	(+)

The ROA representing the profitability of the Chinese commercial bank was measured using the ratio of net income over total asset, where the larger value indicates better profitability. The foreign capital inflow dummy (which this study examines) was set depending on whether the foreign capital flows into the banks or not, which was introduced referring to the prior study of Sul and Kwon (2012), stating that foreign capital inflow influences the bank efficiency positively.

The (+) Sign was assigned to the foreign capital inflow, which was assumed to exert a positive influence on overcoming the global financial crises. Capital adequacy was being utilized for the ex-ante supervision measures for financial institutions, which was measured using the Tier1 capital ratio. The Tier1 capital ratio was measured in the ratio of core equity over risky asset. The higher ratio means that the bank was more stable with higher capital adequacy. According to Barrell *et. al.*, (2010), the higher capital adequacy positively affected the bank profitability during the crisis. Thus, it was expected that capital adequacy would exert a positive (+) impact on the banks' profitability (Park & Liu, 2007; Su, 2010; Sufian & Habibullah, 2012). Asset quality, which was being utilized for the ex-post supervision measures for financial institutions, was measured using a loan loss provision ratio. The loan loss provisions rate is a reserve for potential losses that might arise from the loans classified as 'lower than fixed'; that is, problem loans of the Chinese commercial bank, representing the quality of the lower loan loss provisions rate means better quality of the loan asset. Thus, the negative (–) sign would be expected, because the lower the rate, the more positive the impacts on the profitability (Lee & Chih, 2013).

The cost to income ratio that represents management adequacy is the ratio of operating expense over operating income as the result of the bank operation activities. The lower value of this ratio means better operating profit, so it is expected to have a negative (–) correlation with independent variables (Heffernan & Fu, 2008).

Earning power was measured using a net interest margin, which is the difference between net income and net expense. The larger margin is expected to exert a positive (+) impact on bank profitability.

Liquidity was measured using the ratio of liquid asset over total asset. The higher liquid asset could play the role of bumper when the bank fell into crisis, but the excess liquidity over the optimum level may act as cost. Since Chinese commercial banks generally showed higher liquidity ratio, it was considered that the negative effects were greater than the positive effects with regard to the liquid asset, so the negative sign (–) was assigned.

Growth was measured using the growth rate of deposit. The higher growth rate of deposit facilitates the extension of more loans so the positive sign (+) was given, expecting a positive impact on the profitability. Earnings ratio was measured using the ratio of non-interest operating income over operating income. The higher non-interest operating income means that sources of revenue were diverse as the bank business became more diversified. Thus, the higher ratio was expected to bring positive effects to the profitability, and the positive sign (+) was assigned (Choi & Oh, 2010; Shin, 2012).

Size as a controlled variable was measured using total asset; the larger size was expected to bring higher profitability, so the positive sign (+) was assigned (Park, Suh, & Hahm, 2010).

4. EMPIRICAL ANALYSIS

4.1. Sample Segmentation through Productivity Change Comparison

The global financial crisis had a negative impact on Chinese commercial banks either directly or indirectly, causing deterioration in bank profitability. However, how much damage they brought to the profitability varies between banks. Some banks were less damaged from the financial crisis than others and made a quick recovery. Therefore, what characteristics of Chinese commercial bank helped them stay competitive

before and after the global financial crisis? The objective of this study was to find an answer to this questions.

For this purpose, the sample banks were segmented into the groups for the pre-crisis and post-crisis periods through the execution of the Malmquist index analysis. First, productivity change analysis was conducted for the pre-crisis period, and then the banks with a Malmquist index value of 1 or more were classified as in the H group, while the banks with a Malmquist index value of 1 or less were classified as in the L group. For the post-crisis period, the same method was applied, and the sample banks were segmented into two groups – H Group and L Group. These procedures were applied to a total of 280 banks over the period of 2006-2012, and the sample banks were segmented into 4 groups (HH group, HL group, LH group, LL group). Table 41.2 shows the segmented sample groups, in which the HH group is composed of the banks that showed the productivity improvements for both the pre-crisis and post-crisis periods, while the LL Group is composed of the banks that showed the productivity decline for both the pre-crisis period and the post-crisis period. The HH group is composed of 15 banks, and a total number of sample elements is 96 for the analysis period. The HH group is composed of 15 banks, and the total number of sample elements is 82 for the analysis period.

Table 41.2
Sample Segmentation through Productivity Change Comparison

Classification	*Panel Analysis*			
	HH	*HL*	*LH*	*LL*
Number of Chinese commercial banks	15	9	8	15
(Total number of sample elements)	(96)	(56)	(46)	(82)

Table 41.3 shows the result of the mean difference test between the HH group and the LL group with regard to the major managerial resources and management characteristics variables that this research is interested in.

From the review of the analysis results, the significant difference was identified between the two groups with respect to size, capital adequacy, liquidity, growth, and structure of expense. However, no significant difference was shown between the two groups in terms of asset quality, management adequacy, profitability, and earnings ratio.

Banks belonging to the LL group were shown to be larger than banks belonging to the HH group in total asset representing size. This was because four mega banks belong to the LL group, while data were available about these four mega banks out of a total five mega Chinese commercial banks. That is, it was considered that the HH group was smaller in size and had a lower inequity ratio, liquid asset ratio, and overhead ratio, but was higher in growth than the LL group.

Table 41.3
Mean Difference Test between HH Group and LL Group

Variables		*Group*	*Mean*	*Median*	*T-value (p-value)*
Size	Total assets (million dollar)	HH (n = 96)	43,461	19,529	–5.265*** (0.000)
		LL (n = 82)	387,846	858,32	
Capital adequacy	Tier1 capital ratio	HH (n = 96)	10.18	9.67	–2.435** (0.016)
		LL (n = 82)	16.36	10.13	

Variables		*Group*	*Mean*	*Median*	*T-value (p-value)*
Asset quality	Non-performing loan ratio	HH (n = 96)	13.85	10.93	0.561
		LL (n = 82)	12.94	11.05	(0.576)
Management adequacy	Cost to income ratio	HH (n = 96)	37.52	36.80	–1.358
		LL (n = 82)	39.38	36.25	(0.176)
Profitability	Roa	HH (n = 96)	0.98	1.07	–1.450
		LL (n = 82)	1.08	1.02	(0.149)
Liquidity	Liquid assets ratio	HH (n = 96)	31.09	29.53	–1.618*
		LL (n = 82)	37.27	27.55	(0.054)
Growth	Growth rate of asset	HH (n = 96)	38.98	33.48	2.878***
		LL (n = 82)	29.70	24.72	(0.004)
Earning ratio	Non-interest operating income ratio	HH (n = 96)	14.00	10.39	0.201
		LL (n = 82)	13.64	13.06	(0.841)
Structure of expense	Overhead ratio	HH (n = 96)	0.94	0.94	–4.49***
		LL (n = 82)	3.57	2.95	(–0.000)

Note: The analysis is using the nominal value, and *represents $p < 0.10$, **represents $p < 0.05$, ***represents $p < 0.01$.

Figure 41.2 illustrates Table 41.3 in the radar chart, in which the HH group management index is expressed as multiples of the LL group management index while the LL group management index is set as 1, the base value. These results imply that the difference in productivity between the two groups is not only caused by differences in size, but also management resource allocation and other management characteristics, which reinforces the necessity of the profitability determinants analysis to be conducted next.

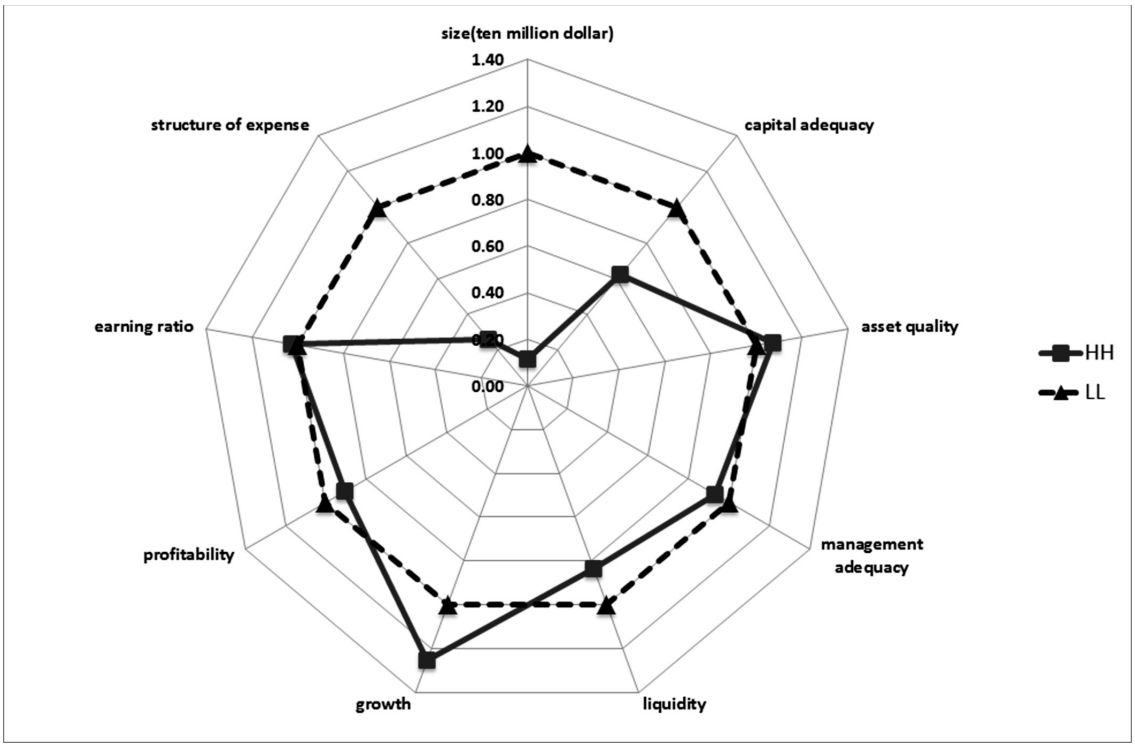

Figure 41.2: Radar Chart for the Mean Difference Test

4.2. Profitability Determinants Analysis

4.2.1. Descriptive Statistics and Correlation

96 elements and 82 elements were extracted and segmented to judge the profitability determinants for the two interest groups, the HH group and the LL group, respectively. Tables 41.4 and 41.5 show the descriptive statistics and correlation analysis results with regard to the independent variables of the two groups. It was identified that the standard deviation values of some variables were larger in the LL group than in the HH group. This means that differences in major management indexes are much larger between sample banks (elements) belonging to the LL group. From the result of the analysis, correlation between some independent variables was shown to be rather higher, so the presence of multicollinearity was verified by calculating the variance inflation factor (VIF) for each independent variable. In general, the presence of multicollinearity is suspected when the VIF is 10 or larger. In this study, it was indentified that multicollinearity was not a concern, since the VIF value of each of the two groups is shown to be 2.25 and 4.65 (Montgomery *et. al.*, 2001).

Table 41.4
Descriptive Statistics and Correlation Analysis of HH Group Independent Variables (N1 = 96)

Descriptive statistics	*Capital adequacy*	*Asset quality*	*Management adequacy*	*Earning power*	*Liquidity*	*Growth*	*Earning ratio*	*Size ($100 million)*
Mean	10.183	13.847	37.52	2.612	31.092	38.983	14.000	434.61
Standard deviation	3.075	10.793	7.841	0.605	11.374	23.920	12.127	749.51
Correlation coefficient								
FCI dummy	1.000							
Capital adequacy	–0.130	1.000						
Asset quality	0.109	–0.145**	1.000					
Management adequacy	–0.230**	0.136	–0.208**	1.000				
Earning power	–0.121	0.158	–0.117	–0.224**	1.000			
Liquidity	–0.241**	–0.077	–0.278***	–0.154	–0.176*	1.000		
Growth	0.158	0.228**	–0.002	–0.319***	–0.117	0.451***	1.000	
Earning ratio	–0.272***	–0.137	0.239**	–0.187*	–0.531***	–0.108	0.130	1.000
Size	0.433***	–0.046	–0.085	–0.309***	-0.144	–0.364***	–0.081	0.007

*, **, ***indicate statistical significance at the significance level = 10%, 5%, 1%, respectively.

Table 41.5
Descriptive Statistics and Correlation Analysis of LL Group Independent Variables (N2 = 82)

Descriptive statistics	*Capital adequacy*	*Asset quality*	*Management adequacy*	*Earning power*	*Liquidity*	*Growth*	*Earning ratio*	*Size ($100 million)*
Mean	16.36	12.938	39.379	2.923	37.269	29.697	13.648	3878.46
Standard deviation	24.64	10.765	12.742	1.036	35.345	18.145	11.14	6360.56
Correlation coefficient								
FCI dummy	1.000							
Capital adequacy	–0.375***	1.000						

Descriptive statistics	*Capital adequacy*	*Asset quality*	*Management adequacy*	*Earning power*	*Liquidity*	*Growth*	*Earning ratio*	*Size ($100 million)*
Asset quality	0.105	–0.279**	1.000					
Management adequacy	–0.415***	0.315***	–0.111	1.000				
Earning power	–0.224*	0.020	–0.202*	–0.046	1.000			
Liquidity	–0.432***	0.416***	–0.369***	0.196*	0.219**	1.000		
Growth	–0.120	–0.214*	0.153	0.143	0.112	–0.232**	1.000	
Earning ratio	–0.128	0.220**	0.099	–0.322***	–0.248**	0.252**	–0.234**	1.000
Size	0.425***	–0.470***	0.107	–0.446***	–0.307***	–0.364	–0.140	–0.030

*, **, ***indicate statistical significance at the significance level = 10%, 5%, 1%, respectively.

4.2.2. *Profitability Determinant Analysis*

In this section, I examined the management characteristics of the Chinese commercial banks that demonstrated a quick recovery by comparing the profitability determinants between the HH group and the LL group. For this, the panel analysis was conducted with the 2006-2012 data for the HH group and the LL group.

Table 41.5 shows the major results of the panel analysis on the profitability determinants of the two groups, in which the two groups all support the fixed effects model. Looking into the analysis results for the two groups, the loan loss reserve ratio representing asset quality had negative (–) impacts on the dependent variable, and the ratio of operating expense over the operating income representing management adequacy also had negative (–) impacts, but the net interest margin representing earning capability had positive (+) impacts, all of which were statistically significant with the 1 % significance level. This means that the smaller the loan loss reserve ratio, the smaller the expense/income ratio, but the higher the net interest margin improved the profitability and the crisis management ability for both the two groups.

On the other hand, some independent variables were shown to significantly affect the profitability in a specific group, which supported the hypothesis that the profitability determinants might differ between the HH group and the LL group. The foreign capital inflow dummy this study examined was shown as the positive sign (+) as expected in the HH group, but no significant effects were represented in the LL group. This means that the foreign capital inflow helped improve the profitability in the HH group with higher productivity.

Tier 1 capital ratio representing capital adequacy was shown to have a positive (+) impact on the dependent variable in the LL group only (Barrell *et. al.*, 2010). The Tier 1 capital ratio is the evaluation index to measure the soundness and stability of the bank as the ratio of the risky asset (problem loan) over equity, in that it becomes the reaction measures of the bank to the crisis when the problem loan has increased suddenly so the bank falls into the business risk. Thus, I imply that the equity ratio as an ex-ante supervision measure had an important impacts on the bank performance in LL.

The non-interest income ratio representing the earnings ratio was shown to affect the dependent variable only in the HH group. The higher non-interest income ratio indicates a higher diversification ratio of the bank. It was considered that taking the strategy of increasing the non-interest income through

diversification positively affected the improvement of the profitability in the HH group with higher productivity.

On the other hand, size variables were shown in the positive sign (+) in both of the two groups as expected, but the significance was indentified only in the LL group at the 1% level. This means that the larger banks with a larger scale realized the higher profitability within the LL group. In other words, it could be interpreted that the larger-sized mega commercial bank showed higher profitability due to the economy of scale within the LL group.

Table 41.6
The Comparison of the Profitability Determinants

Panel Analysis				
Group	*HH*		*LL*	
Independent variable	*Coefficient (t-value)*	*VIF*	*Coefficient (t-value)*	*VIF*
FCI dummy	0.207** (2.70)	1.78	–0.142 (–1.41)	4.65
Capital adequacy	0.007 (1.46)	1.25	0.002* (1.85)	1.85
Asset quality	–0.016*** (–12.35)	1.16	–0.018*** (–10.41)	1.26
Management adequacy	–0.019*** (–6.33)	1.69	–0.035*** (–10.83)	2.04
Earning power	0.236*** (6.52)	2.25	0.283*** (9.04)	1.45
Liquidity	–0.003 (–1.56)	1.45	0.001 (0.79)	1.79
Growth	0.001 (0.85)	1.54	–0.002 (–1.59)	1.20
Earning ratio	0.011*** (5.92)	1.74	–0.004 (–1.54)	2.27
Size	0.038 (1.38)	1.40	0.107*** (3.22)	4.43
Constant	0.657** (2.14)	–	0.825** (2.18)	–
N	96		82	
Overall R^2	0.71		0.93	
F value	6.52 ***		6.27 ***	
Hausman (x^2)	18.12 ***		58.76 ***	

*, **, *** indicate statistical significance at the significance level =10%, 5%, 1%, respectively.

Summarizing the profitability determinant analysis results, it can be said that banks with a more foreign capital inflow and the higher non-interest income realized higher profitability in the Chinese commercial banks, which that showed the continual improvements in productivity with a good constitution and superior crisis control ability (HH group). In particular, these were well diversified and showed a higher profitability structure with a lower cost structure. On the other hand, capital adequacy and size influenced the productivity

greatly in the Chinese commercial banks, which showed the productivity decline throughout the pre-crisis and the post-crisis period (LL group). Thus, it was important to secure the stability in these banks.

5. CONCLUSION

In this study, I analyzed which characteristics acted as factors enabling some commercial banks to overcome the 2008 global financial crisis more rapidly and better than other banks, focusing on Chinese commercial banks. For this purpose, sample banks were segmented into two groups: the HH group with improved productivity in both the pre-crisis period and post-crisis period, and the LL group, with declined productivity in both the pre-crisis period and post-crisis period, based on the productivity index of the banks for the pre-crisis period (2006-2009) and the post-crisis period (2010-2012). Then, the comparison analysis of the profitability determinants were conducted for each group. Through the analysis, we indentified that differences existed in the profitability determinants between the two groups, and the management characteristics of the Chinese commercial banks remained robust in the midst of the global financial crisis.

A Malmquist index analysis was conducted on 280 sample elements over 2006-2012, during which the HH group (96 elements) and the LL group (82 elements) were extracted. Then, the profitability determinants were verified through a panel analysis on each group. From the empirical analysis results, asset quality, management adequacy, and earning ability were identified as the determinants having significant impacts on the two groups in common. That is, the lower the loan loss reserve, the less the operating expense versus the corresponding operating income, and the higher net interest margin improved the profitability and helped overcome the financial crisis.

On the other hand, the foreign capital inflow dummy and earnings ratio were shown as significant factors only in the HH group, while capital adequacy and size variable were identified as significant factors in the LL group, which support the hypothesis that the profitability determinants may differ between the HH and LL groups.

As for HH group that sustained higher productivity both before and after the financial crisis, the banks that raised the foreign capital from overseas showed better diversification, higher non-interest income, and improved profitability, while in the LL group with the lower productivity, securing stability is more important, and the profitability depends greatly on capital adequacy, and the larger size resulted in better productivity.

These results imply that the Chinese commercial banks need to transform their existing business structures into a more diverse earnings structure if they want to be equipped with competitiveness in time, even though they possess a simple deposit-loan centric structures at this time. In addition, it implies that the reaction ability in the financial crisis can vary between banks, depending on how the banks allocate management resources and drive management strategies.

This study has academic significance in that it attempted a new approach with the analysis of the global financial crisis and the reaction ability of the Chinese banks in the crisis. However, it has a limitation in that the analysis performed uses the explorative research methods. In particular, it didn't deal sufficiently with the issue of 'In what pathway does the foreign capital inflow affect or contribute to the Chinese commercial banks in overcoming the global financial crisis?" and didn't include some influential factors such as macro variables, bank characteristic variables, and government intervention in the model due to

sample limitations. It needs to be complemented with more advanced research models that can manage these influential factors through reinforced data collection in the future.

6. APPENDIX

The foreign capital inflows to Chinese banking industry are 106.6 billion dollars by the end of 2012. Foreign investors who invested initially in 5% or more equity of each individual bank are summarized as follows.

Table 41.7
Status of Foreign Capital Inflow to Chinese Commercial Banks (Initially, 5% or more)

S. No.	*Bank*	*Date*	*Listing Status*	*Type*	*Investment(% of Company)*	*Investor(s)*
1	Xiamen International Bank	1985.08.	X	CCB	25.00%	Asian Development Bank (10%), Shinsei Bank (10%), Sino Finance Group (5%)
2	Bank of Shanghai	1999.09.	X	CCB	5.00%	IFC (International Finance Corporation)
3	Bank of Nanjing	2001.11.	○	CCB	15.00%	IFC
4	Shanghai Pudong Development Bank	2002.12.	○	JSCB	5.00%	Citi Bank
5	Ping An Bank	2002.01.	X	CCB	10.00%	HSBC
6	Bank of Dalian	2003.11.	X	CCB	10.00%	SHK Financial Group
7	Industrial Bank	2003.12.	○	JSCB	24.98%	Hang Seng Bank (15.98%), IFC (4%), Tetrad Ventures Pte Ltd (5%)
8	Shenzhen Development Bank	2004.06.	○	JSCB	17.89%	Newbridge Capital
9	Bank of Communications	2004.08.	○	LCB	19.90%	HSBC
10	Qilu Bank	2004.09.	X	CCB	20.00%	Commonwealth Bank of Australia
11	Xi'an City Commercial Bank	2004.09.	X	CCB	5.00%	Bank of Nova Scotia (2.5%), IFC (2.5%)
12	Hua Xia Bank	2005.01.	○	JSCB	13.98%	Deutsche Bank (9.9%), SAL OPPENHEIM JR. & CIE S.C.A. (4.08%)
13	Bank of Beijing	2005.03.	○	CCB	19.90%	Internationale Nederlanden Group BANK
14	Bank of Hangzhou	2005.04.	X	CCB	19.91%	Commonwealth Bank of Australia
15	China Construction Bank	2005.07.	○	LCB	14.40%	Bank of America Corporation (8.52%), Temasek Holdings (5.88%)
16	Bank of China	2005.08.	○	LCB	15.00%	Temasek Holdings(5%), Royal Bank of Scotland (10%)
17	China Bohai Bank	2006.02.	X	JSCB	19.90%	Standard Chartered Bank
18	ICBC	2006.04.	○	LCB	7.20%	Goldman Sachs Group (4.9%), Allianz Group (1.9%), American Express Company (0.4)
19	Bank of Ningbo	2006.05.	○	CCB	12.20%	OCBC Bank
20	Bank of Tianjin	2006.07.	X	CCB	20.00%	Australia & New Zealand Banking
21	Shanghai Rural Commercial Bank	2006.11.	X	RCB	19.90%	Australia & New Zealand Banking
22	China Guangfa Bank	2006.11.	X	JSCB	24.74%	Citi Group (20%), IBM (4.74%)

S. No.	Bank	Date	Listing Status	Type	Investment(% of Company)	Investor(s)
23	Bank of Chongqing	2007.04.	X	CCB	17.00%	Dah Sing Bank
24	Bank of Chengdu	2007.08.	X	CCB	19.90%	Hong Leong Bank Berhad
25	Evergrowing Bank	2008.06.	X	JSCB	15.38%	United Overseas Bank Group
26	Bank of Qingdao	2008.08.	X	CCB	24.98%	Intesa Sanpaolo S.P.A (20%), LCF Rothschild Group (4.98%)
27	Yantai Bank	2008.12.	X	CCB	24.99%	Hang Seng Bank Limited (20%), Wing Long Bank (4.99%)
28	Xiamen Bank	2008.12.	X	CCB	19.99%	Fubon Bank Hong Kong
29	Bank of Yingkou	2009.09.	X	CCB	18.19%	CIMB Bank
30	Bank of Jilin	2010.06.	X	CCB	18.00%	Hana Bank
31	Fujian Haixia Bank	2012.01.	X	CCB	20.00%	Hua Nan Financial Holdings

Data: BankScope equity inflow data, annual reports of the banks, and portal site data as of December 31, 2012
Note: According to China Banking Regulatory Commission (CBRC), Chinese commercial banks are classified into 5 categories: Large Commercial Banks (LCB), Joint-Stock Commercial Banks (JSCB), City Commercial Banks (CCB), Rural Commercial Banks (RCB), and Foreign Commercial Banks (FCB). Out of these 5 banks, LCB, JSCB, CCB raised the foreign capital, while RCB, FCB didn't.

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