Corporate Governance and Performance of Listed Commercial Banks during Financial Crisis: Evidence from China's Banking Industry

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This paper examines the impact of corporate governance on bank performance. Using a sample of China's listed commercial banks from years 2007 to 2009, we investigate how corporate governance practices affect the performance of China's listed banks during financial crisis. We use two-stage least squares (2SLS) regression to solve the well-known endogeneity problem in corporate governance literature, and compare our results to OLS regression of bank performance on governance mechanisms. A number of interesting findings are yielded in our study. First, there are an inverted U-shaped relation between board size and bank performance, and between proportion of independent directors and performance. Second, the banks whose controlling shareholder is the State can generate better performance than other banks. Third, the shareholding of the largest shareholder affects bank performance but its effect is non-linear, while the shareholding of other large shareholders affects negatively on the bank performance. Fourth, executive compensation incentives have a significant positive impact on bank performance. Our results are robust to various specifications.

1. INTRODUCTION

Recently, a financial crisis from Wall Street has spread all over the world. This crisis, beginning with the failures of large financial institutions in the United States, has rapidly resulted in a number of European banks' failures since the end of 2007. Banking crises have consequences due to poor governance of banks (Levine, 2004), and the possibility of broader macroeconomic implications. Although the effects of the sub-prime crisis on China's banking industry were not as serious as European countries, indeed, it has the potential of negative impact on banking sectors. Thus, the current financial crisis has revived more concerns of corporate governance in the banking sector throughout the world.

The Basel Committee on Banking Supervision (BCBS) placed stronger emphasis on improving the corporate governance of financial entities. According to BCBS, "corporate governance for banking organizations is arguably of greater importance than for other companies, given the crucial financial intermediation role of banks in an economy" (BCBS, 2005). In addition, previous research shows that weak corporate governance does not only lead to poor firm performance and risky financing patterns, but are also conducive to macroeconomic crises (Claessens et al. 2002), like the 1997 East Asia crisis. Other researchers contend that effective corporate governance is important for increasing investor confidence and market liquidity (Donaldson, 2003).

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The purpose of this study is to investigate the relationship between corporate governance and performance in China's banking sector during the financial crisis. This study addresses the following specific questions. How can corporate governance affect bank performance during a financial crisis? What are the main driving forces behind corporate governance on bank performance? How to ensure that managers follow the interests of shareholders in order to reduce agency problems which are related to bank governance? Even though a growing body of empirical research examines the structure and effectiveness of corporate governance system (Yermack, 1996), only a few studies focus on bank's corporate governance (Adams and Mehran, 2005; Caprio et al., 2007; Levine, 2004; Macey and O'Hara, 2003), especially in emerging markets. The effect of corporate governance on bank performance is still a relatively new topic for commercial banks in China. Thus, this study bridges a gap in the literature and contributes to the understanding of corporate governance and performance of banks in China during financial crisis.

The increasing complexity of the banking sector aggravates the issue of asymmetry of information and diminishes stakeholders' capacity to monitor bank managers' decisions (Andres and Vallelado, 2008). Board compensation is a key mechanism to monitor managers' behavior, because the role of boards as a mechanism for corporate governance of banks takes on special relevance in higher informational asymmetries due to the complexity of the banking business. Bank directors' specific knowledge of the complexity of the banking business enables them to monitor and advise managers efficiently.

Besides, the conflicting goals between shareholders and manager can introduce an agency problem. The manager's self-interest could lead to the misuse of bank resources, for instance, through investing in risky projects or serving their own benefits (Jensen & Meckling, 1976; Shleifer & Vishny, 1986). Hence, in order to control conflicts of interest and reduce agency problems in the banking sector, various internal and external tools which are known as corporate governance have been suggested.

Given the unique features[1] of China's banking industry, our data sample includes 14 commercial banks in China that are listed in Shanghai and Shenzhen Stock Exchanges during years 2007 to 2009[2]. We examine how various aspects of corporate governance affect bank performance by investigating empirically the determinants of board size and composition, board independence and functioning, executive compensation, and ownership structure. Our empirical analysis employs an econometric model that incorporates 2SLS regression model in order to solve the well-known endogeneity problem in corporate governance research, which demonstrates the empirical superiority of 2SLS over OLS model.

Overall, we find that there is an inverted U-shaped relationship between board size and bank performance, and between the independent directors and bank performance. This indicates that an optimum mix of executive and independent directors is more adequate to create value for the banks than excessively independent boards. In terms of ownership structure, the banks whose controlling shareholder is the State can generate better performance than other banks. Moreover, we find that ownership concentration is nonlinear

[1] Since the banking sector in China has been undergoing a rapid change in ownership and governance evaluation, as a large country in emerging markets, large banks and business favor a model in which the state owns a large proportion of company shares..

[2] It contains 14 listed commercial banks in China during 2007 to 2009. The China's listed banks include Industrial and Commercial Bank of China, China Construction Bank, Bank Of China, Agricultural Bank of China, Bank of Communications, Citic Bank, Bank of Beijing, Bank Of Nanjing, Bank of Ningbo, Shenzhen Development Bank.

related to bank performance in our sample. In addition, we observe that executive's ownership incentive have a positive impact on bank performance. Furthermore, the result suggests that executive compensation is an effective incentive mechanism in enhancing performance. Our results are robust to various specifications.

We make several contributions to the literature. First, this study provides new insights on bank governance research in the emerging markets, especially during the financial crisis. This extension allows researchers to compare our findings with other countries and other periods. Second, we use appropriate statistical methods (2SLS model) to test how bank governance affects financial performance, which can deal with the endogeneity problem. Moreover, we compare 2SLS with OLS model to demonstrate that 2SLS model provides better identification in estimation.

The remainder of the paper is organized as follows. Section 2 briefly describes China's banking environment. Section 3 provides a brief literature review. Section 4 outlines the banking industry's corporate governance issues and testable hypotheses. Section 5 describes the data, variables, and methodology. Section 6 presents our empirical results and robust check. Section 7 concludes.

2. CHINA'S BANKING ENVIRONMENT

China's banking sector has gone through significant reform in the past decade. Until 2004, the big four commercial banks in China[3] were still state-owned enterprises (SOEs). Beginning from the year 2005, the ownership structure of China's major commercial banks has gradually changed. Strategic investors, both domestic and foreign, have become shareholders, and banks have been listed on various stock exchanges. Table 1 shows the statistics of the listed commercial bank in China, which includes the date of listing, stock exchanges and total capital of each bank from year 2005-2008.

After completing financial reorganization and restructuring, the China Construction Bank and Bank of Communications take the lead in listing on the Hong Kong Stock Exchange in 2005. Then, Bank of China & the Industrial and Commercial Bank of China (ICBC) were listed in Hong Kong, Shanghai Stock Exchanges in 2006 respectively. The successful dual listing of China's commercial banks became known as the "A+H"[4] shares listing model. Then there are six banks listed in the stock market in 2007. As shown in Table 1, there are 16 listed commercial banks in China until August, 2010. In figure 1 and figure 2, the results show that the capital ratio of many banks is almost 10%, while the total capital of the big four state-owned banks is higher than any other listed commercial banks in China.

However, the current global financial crisis has exerted a potential pressure on Chinese banks. Since the end of 2008, the PBOC switched to a loose monetary policy in an effort to stem this financial crisis. Moreover, the Chinese government cut the interest rates and deposit reserve ratios. The government cut the loan rate by 0.27 percentage points for

[3] Between 1979 and 1984, the Agricultural Bank of China (ABC), the Construction Bank of China (PCBC), the Bank of China (BOC), and the Industrial and Commercial Bank of China (ICBC) split off from the PBOC (People's Bank of China), which retained its central bank role.

[4] "A+H" share listing model means that the bank listed on the Shanghai Stock Exchange (A share) and Hong Kong Stock Exchange (H share) at the same time.

adding to official efforts to revive slowing economic growth. However, many problems affect the effectiveness of China's banking industry, such as a rebound of non-performance loans, collateral of banks shrinking and the influence of overseas acquisitions and investments, which increase the potential risk in banking sectors. In the current complicated environment and grim economic situation, effective bank governance mechanism plays an important role in well-functioning of banks and increasing investors' confidence. In this study, we investigate the impact of corporate governance on bank performance during this period.

3. LITERATURE REVIEW

Many empirical literatures focus on the issue of corporate governance (La porta et al., 1998), previous studies on specific aspects of corporate governance, such as board composition (e.g., Agrawal & Knoeber, 1996; Hermalin & Weisbach, 2003; Bhagat & Black, 2002), executive compensation (e.g., Abowd & Kaplan, 1999; Bebchuk, Fried, &Walker, 2002), and ownership concentration (e.g., Himmelberg, Hubbard, & Palia, 1999; Morck, Shleifer, & Vishny, 1988).

However, it seems there is a lack of focus of corporate governance studies on the banking sector. The agency problems are particularly crucial for banks as they are opaque (Levine, 2003; Caprio and Levine, 2002) largely because of information asymmetries, which arising for financial intermediaries aggravated by the complexity of the bank business (Furfine, 2001; Levine, 2004).Thus, corporate governance in banks plays a special role in the economy due to banks' high leverage and the uniqueness of these organizations.

Pathan, Skully, Wickramanayake (2008) show a statistically significant negative relation between Thai banks' board size and performances, while a statistically significant positive impact of the proportion of independent directors on the bank board and performance for 1999-2003. Pinteris (2002) documents a negative relationship between bank ownership concentration and bank performance in the Argentinean banking industry. Crespí, García-Cestona, and Salas (2004) found a negative relationship between performance and governance intervention for Spanish banks, but these varied with different ownership structures or types of intervention. They find that internal governance works well for independent commercial banks whereas external governance (such as mergers) is better for savings banks. Adams and Mehran (2003) find bank holding companies in the US consists of relatively larger boards, but they find no consistent relationship between their board composition and performance. In addition, there are also some studies on this topic during or after financial crisis time. During the 1997 Asian financial crisis, the reforms in banking governance structure and cleaning up of nonperforming loans of financial institutions, has built a foundation upon which financial institutions operate with profitability and stability (Choea & Lee, 2003).Johnson, Boone, Breach and Friedman (2000) found that the Asian crisis in 1997 revealed the inherently weak corporate governance structure of the financial systems of the affected countries- Indonesia, Korea, Malaysia, Thailand and to a lesser extent to Philippines. Anderson and Campbell (2004) reached similar conclusions from their examination of 100 Tokyo Stock Exchange listed Japanese banks over 1985-1996. They found that the internal governance tools became more common after the Japanese crisis in the late 1980s. Choe and Lee's (2003) finding that the Korean overall market index returns is Granger-caused by Korean bank sector returns especially after the crisis.

In general, although some empirical findings on corporate governance and performance in non-financial institutions are also applicable to banks in developed countries, there has been a paucity of research on the relationship between corporate governance and bank performance in developing countries, especially in China's listed commercial banks. Our study of China's commercial banks adds to the understanding of the importance of corporate governance in the banking sector during financial crisis.

4. EMPIRICAL HYPOTHESES

Adam and Mehran (2003) find a statistically significant positive relationship between board size and performance for the US bank-holding companies (BHCs) from 1986-1996, they might expect boards of directors to be larger, since a larger board facilitates manager supervision and brings more human capital to advise managers. In contrast, boards with too many members lead to problems of coordination, control, and flexibility in decision-making, which will harm the efficiency. Andres and Vallelado (2008) find the possibility of an inverted 'U' shape relationship between board size and bank performance by using a sample of 69 large commercial banks from six developed countries for the period 1995-2005. So, the impact of board size on bank performance is a trade-off between advantages (monitoring and advising) and disadvantages (coordination, control and decision-making problems). During current financial crisis, the effect of board size and bank performance is expected to be nonlinear. Therefore, based on the above discussion the following hypotheses are advanced.

Hypothesis 1: There is an inverted U-shaped relationship between board size and bank performance.

The empirical findings on board independence and bank performance have been mixed. Prior studies show that a majority of independent directors are necessary for better bank governance (Skully, 2002). Others find there is an inverted U-shaped relation between outsider and bank performance (Andres and Valledo, 2008). In this study, we emphasize that an independent board of directors has fewer conflicts of interest when monitoring managers. Thus, when the monitoring function is prevalent, we expect that adding new independent directors to the board will improve the supervision of management and reduces the conflict of interest among stakeholders, but too many independent directors will destroy bank value because of the problems such as coordination and decision-making. According to this, it might have an optimum mix of executive and independent directors at a point, which is more adequate to create value for the banks than excessively independent boards. Thus, based on the above, the following hypothesis is examined:

Hypothesis 2: There is an inverted U-shaped relation between proportion of independent directors on the board and bank's performance.

The analysis of the number of annual meeting needs to take into account the internal functioning of the board (Andres and Vallelado, 2008). In fact, one particularly important point which can affect how boards operate is the frequency of board meetings (Vafeas, 1999). The effect of the activity of a board yield either proactive or reactive results. Some evidences indicates that the impact of frequency of meetings on performance is positive. Meetings provide board members with the chance to discuss and exchange ideas on how they wish to monitor managers and bank strategy. Hence, the more frequent meetings provide a more relevant advisory role, which can enhance the performance. By contrast, frequent meetings

might also be a result of board reaction to poor performance. However, in this study, we expect the association between board meetings and bank value might be positive during the current financial crisis. Because the relevance of the board's advisory role can be increased by the complexity of the banking business, which the frequency of the meetings provides a more relevant advisory role and increases the bank value. Therefore, based on the above, the following hypothesis is examined.

Hypothesis 3: the impact of the number of board Meetings on bank's performance is a significant positive.

One of the most important ways for a firm maximizing its value is through a well-designed ownership structure of the firm's shares (Bai et al., 2002). The results of these empirical studies, which primarily investigate the association between bank ownership and performance and that between ownership and efficiency, are mixed (Lin and Zhang, 2009). Hasan and Marton (2003), Jemric and Vujcic (2002), and Weill (2003) address that bank efficiency is positively related to foreign ownership as opposed to state ownership, while Nikiel and Opiela (2002) observe that domestic private banks are more profit efficient than foreign banks. During the financial crisis, the banks whose controlling shareholder is the state could benefit more from the support of government than the other banks. Furthermore, the listed banks whose controlling shareholder can always be the large banks in China, which the effects faltered from economic recession might be smaller than other banks. Therefore, we expect that state ownership banks can generate better performance than other banks during financial crisis. Accordingly, based on above discussion the following hypotheses are advanced.

Hypothesis 4: the banks whose controlling shareholder is the State can generate better performance than other banks.

In previous studies, there is disagreement over the impact of ownership structure (concentration) and bank performance (Griffith, Fogelberg and Weeks, 2002). Sun (2006) provides empirical studies for 9 commercial banks with 23 samples of annual reports during 2001-2004. It found that concentration of bank ownership is a negative related to bank performance. However, using simple linear regression, Pi and Timme (1993) find bank performance (ROA) unrelated to institutional and large block-holders' ownership in large, publicly traded U.S. commercial banks. In this study, we indicate that the ownership concentration potentially has two conflicting effects on the quality of bank governance. When the largest shareholder increases his shareholding, the constraints from other shareholders become weaker, which gives the largest shareholder more discretionary powers of using the firm's resources in the areas that only serve their own benefits. On the other hand, when the largest shareholder is exceedingly large (close to 100 percent of the bank) and therefore there is high degree of congruence between his interest and the bank's interest, then ownership concentration may have a positive effect. So, we expect that there is a U-shaped relation between the concentration of its largest shareholder and bank performance. However, the concentration of other large shareholders (such as concentration of the second to the tenth largest shareholder's holdings) other than the controlling shareholder increases the monitoring of the management and facilitates more effective contest for corporate control (Bai, Liu and Song, 2002). So it will help reduce the possibility of unconstrained large shareholders misusing firm resources and diminish the agency conflict in China's listed banks. As expected, the impact of the concentration of other large shareholders on bank performance might be significantly positive. In line with the above discussion, the following hypothesis is examined.

Hypothesis 5: the shareholding of the largest shareholder affects negatively the bank value but its effect is non-linear, while the impact of the holding of other large shareholders on bank performance is positive.

CEO compensation might also prove an effective mechanism to deal with governance problems (Brickley and James, 1987; Crespí et al., 2004). The conflicts of interest that emerge between CEOs and the shareholders they represent are a classical example of the principal-agent problem (Crawford, Ezzell and Miles, 1995), and the primary means for shareholders to ensure that a manager takes optimal action is to tie his/her pay to the performance of the firm (Aggarawal & Samwick, 1999). Crawford, Ezzell and Miles (1995) posit that bank CEO compensation became more sensitive to performance as bank management became less regulated during year 1976-1981.Crespi-Cladera and Gispert (2003) established a positive relationship between changes in company performance and board remuneration within Spanish listed companies. Sun (2006) considers the CEO compensation is a positive related to bank performance. In order to effectively construct compensation contracts for mitigating these agency problems during a financial crisis, the relationship between compensation contracts is expected to affect the efficient incentive mechanisms, which inevitably enhances performance. In view of the foregoing discussion, the following hypothesis is examined. *Hypothesis6:* The higher level of executive's compensation, the higher the level of bank performance.

5. DATA, VARIABLES, AND ECONOMETRIC MODEL

5.1. Data

Our sample includes data for all China's listed commercial banks in the Shanghai and Shenzhen Stock Exchanges from years 2007 to 2009.To assemble the panel data, we obtained our data on board size, composition, ownership concentration, executive compensation and other corporate governance variables from China Stock Market Accounting Research (CSMAR) Database. We also obtained complementary information from financial statements of the China's listed commercial banks, which are reported in each bank's websites. Eliminating banks with missing data for any of the variables, our dataset includes 14 listed commercial banks based on data availability. This sample selection procedure yields 41 bank-year observations for a 3-year period. Financial data refer to the end of the year.

Although the 14 listed commercial banks in the sample represent only part of the total number of quoted banks in China, but they are represented by large commercial banks that account for large banking industry assets, equity, loans, or deposits. Thus, our sample is representative of China's banking industry.

5.2. Variables and Statistics

5.2.1. Dependent Variable (Bank Performance indicators)

The main independent variable of interest is bank's financial performance. According to previous corporate governance research, we measure bank performance by using *ROE*, which is return on average equity. *ROE* are used widely to assess bank performance (Knapp, Gart and Becher 2005; Choi and Hasan 2005; and Shen and Chang 2006). Moreover, the use of *ROE* facilitates comparisons with other non-banking studies.*ROE* is calculated as the ratio

of net profit to total bank equity. Table 2 presents the descriptions of variables. Table 3 provides summary statistics for selected variables that describe the governance structures and bank performance of our sample. The average *ROE* across banks and time is 16.64%. The maximum of this performance variable is 30.02% with a minimum of 3.74%.

$$ROE_{i,t} = {net\ profit_{i,t}}/{total\ bank\ equity_{i,t}}$$

Bank governance would be involved in the mechanism of board size and composition, executive compensation, ownership structure and other variables. We measure bank governance by using independent variables as follows.

5.2.2. Independent Variables (Bank Governance)

The first group of independent variables measures the board size. The board of directors' role in effective corporate governance has become especially important to banks and their regulators following the Asian financial crisis in 1997 (Pathan, Skully, & Wickramanayke, 2007). We measure board size with the variable BS, which is the total number of directors on the bank board. According to Andres and Vallelado (2008), we also add the variable BS_sq, which is square of the board size, for the possibility of an inverted 'U' shape association between board size and performance (Yermack, 1996) As reported in Table3, the mean sizes of the board are 16.05 and 16 directors for the period 2007-2009, respectively, which is higher than the average board size (12) reported for 452 U.S non-financial firms between 1984 and 1991 (Yermack, 1996), but close to the 17 directors obtained by Adams and Mehran (2005) in the period 1995–1999 for banks.

The second group variable is board composition and board independence. We measure the composition of the board of directors by using the proportion of executive directors (PED), which we define as the number of executive directors to the total number of board directors. Table 3 shows that the executive directors range from 2 to 16. On average, the executive directors account for 51% of directors. In addition, we define a variable PID *as* proportion of the number of independent directors on the board. Table 3 reports the mean bank board comprises 16 directors, which indicates eight outsider and eight insiders. This 50% is below the Adams and Mehran's (2005) data that outsiders account for 68.7% of directors. On average, the independent directors account for 34.8% of all directors.

$$\mathbf{PED}_{i,t} = {the\ number\ of\ executive\ directors_{i,t}}/{total\ number\ of\ board\ directors_{i,t}}$$

$$PID_{i,t} = {the\ number\ of\ independent\ directors_{i,t}}/{total\ number\ of\ board\ directors_{i,t}}$$

The third group of independent variables is the functioning of boards. As our proxy for the functioning of boards of directors, we define a variable (Meeting) as the number of meetings held in a bank each year. Table 3 shows an average number of meetings of 10.4, which is close to the 10.45 meetings reported by Andres and Vallelado (2008). The fourth group variable is Ownership structure, which are important factors in determining performance. Pinteris (2002) reports that banks with a more concentrated ownership structure exhibit higher loan-portfolio risk. He explains the finding as an illustration of ownership concentration exacerbating agency conflicts, specifically between bank owners and bank depositors. We define a variable (State) as a dummy variable with a value of 1 if a majority

Table 1 Statistic of Listing Date, Stock exchanges and Total Capital

Name of listed banks	Date of Listing	Stock Exchange(s) Listed	Total Capital Ratio (%)				Total Capital (Mil CNY)			
			2008	2007	2006	2005	2008	2007	2006	2005
Shenzhen Development Bank Co., Ltd	1991-04-03	Shenzhen Stock Exchange	8.6	5.8	3.7	3.7	23959.4	12691.9	6419.8	4880
Shanghai Pudong Development Bank	1999-11-10	Shanghai Stock Exchange	9.1	9.2	9.3	8	68213	50374	39959	28435
China Minsheng Banking Corporation	2000-12-19	Shanghai Stock Exchange	9.2	10.7	8.2	8.3	70767	61513.2	34706.3	26226
	2009-11-26	Hong Kong Stock Exchange								
China Merchants Bank Co Ltd	2002-04-09	Shanghai Stock Exchange	11.3	10.4	11.4	9	104039	74646	62857	38122
	2006-09-22	Hong Kong Stock Exchange								
Hua Xia Bank	2003-09-12	Shanghai Stock Exchange	11.4	8.3	8.3	8.2	40346	24204	19179	16177
Industrial & Commercial Bank of Chin (The) - ICBC	2006-10-27	Shanghai Stock Exchange	13	13	14	10	620033	576741	530805	311844
	2006-10-27	Hong Kong Stock Exchange								
Industrial Bank Co Ltd	2007-02-05	Shanghai Stock Exchange	11.2	11.9	8.2	8.1	57717	48959.2	27455.7	20077
China CITIC Bank Corporation Limite	2007-04-27	Shanghai Stock Exchange	14.3	15.3	9.4	8.1	106870	95171	44411	30159
	2007-04-27	Hong Kong Stock Exchange								
Bank of Communications Co. Ltd	2007-05-15	Shanghai Stock Exchange	13.5	14.4	10.8	11.2	185447	167858	106303	91009
	2005-06-23	Hong Kong Stock Exchange								
Bank of China Limited	2006-07-05	Shanghai Stock Exchange	13	13	14	10	532793	500640	471362	326237
	2006-06-01	Hong Kong Stock Exchange								
Bank of Nanjing	2007-07-19	Shanghai Stock Exchange	24.1	30.1	11.7	13.1	11915.6	10434.8	3295.2	2939.9
Bank of Ningbo	2007-07-19	Shenzhen Stock Exchange	16.2	21	11.5	10.8	9295.3	8435.8	3606.8	n.a.
China Construction Bank Corporation	2007-09-25	Shanghai Stock Exchange	12.2	12.6	12.1	13.6	510416	463182	374395	348104
	2005-10-27	Hong Kong Stock Exchange								
Bank of Beijing Co Ltd	2007-09-19	Shanghai Stock Exchange	19.7	n.a.	n.a.	n.a.	37986.1	n.a.	n.a.	n.a.
Agricultural Bank of China	2010-07-15	Shanghai Stock Exchange	9.4	n.a.	n.a.	n.a.	319483	n.a.	n.a.	n.a.
	2010-07-16	Hong Kong Stock Exchange								
China Everbright Bank Co Ltd	2010-08-18	Shanghai Stock Exchange	9.1	7.2	-0.4	-1.5	43705.2	26708.1	-1244.7	-4287.7

Note: we retrieve data of all the banks from the Bankscope database. We obtain a sample of 16 China's listed commercial banks with annual data of total capital and total capital ratio for the period 2005–2008. Financial data refer to the end of the year.

Table 2 Descriptions of variables

Bank Performance	
ROE	Ratio of earnings before interest and taxes to the average total bank equity at the end of year t.
Corporate Governance Variables	
BS	Total number of directors on the board in each bank at the end of year t.
PED	Ratio of the number of executive directors to the total number of board directors in each bank at the end of year t.
PID	Ratio of the number of independent directors to the total number of board directors in each bank at the end of year t.
Meeting	The number of meetings held by board in each bank at the end of year t.
State	A dummy variable with a value of 1 if a majority of the firm's stock is in the hand of state, and 0 otherwise.
Top1	Ratio of Shares held by the largest shareholder to total shares at the end of year t.
Top1_sq	The sum square of the shareholding from the largest shareholder at the end of year t.
Csh	The concentration of shareholder's holding from 2nd to 10th at the end of year t.
CEOpay	The natural logarithm of the sum of top3 executives' pay of the bank at the end of year t.
Control variables	
Size	Natural logarithm of the average total assets of bank.
Leverage	Ratio of debt to the total assets as at the end of each year.
NPL	Ratio of non-performance loan to gross loans in each bank at the end of year t.
yeardummy	Year dummy variable.

of the firm's stock is in the hands of the state, and 0 otherwise. According to Bai et.al (2006), we define a variable Top1 as the Ratio of Shares held by the largest shareholder to total shares. To capture the potential nonlinear effect of shareholding concentration on bank governance, we add variable Top1_sq, which means the sum square of the shareholding from the largest shareholder, to present the concentration of the largest shareholder. In addition, we measure the ownership concentration with another variable CSh, which is the concentration of shareholder's holding from 2nd to 10th. Table 3 reports the mean of the variable State is 78.57%. On average, the top shareholder's holding, *Top1*, is 27.44%, with highest value more than 67.53%. Moreover, the mean and the standard deviation for the concentration of the second to the tenth largest shareholders, *Csh*, are 36.33% and 11.67%, with lowest at 14.31% to highest 60.40%. The last group of variables is executive compensation. The level of executive's compensation (CEOpay) is defined as the natural logarithm of the sum of the top3 executives' pay of the bank. The CEOpay ranges from 14.44 to 17.24 with a mean value of 15.84 for the period of 2007-2009.

$$CEOpay_{i,t} = \ln\left(sum\ of\ top3\ executives'pay_{i,t} \right)$$

5.2.3. Control Variable

We examine the association between bank governance and performance by controlling a set of variables, including bank size, leverage, non-performance loan, and year. The first control variable is bank size (Size). Evidence in (Chen and Metcalf, 1980) indicates that firm size may confound relationships between ownership structure and bank performance. Cho (1985) discusses several proxies of bank size such as size of equity capital, size of deposits, total assets and the number of countries of operation. Here we measure bank size by the natural logarithm of the bank's average total assets.

$$Size_{i,t} = Ln(average\ total\ asset\ of\ bank_{i,t})$$

The second control variable is Leverage. Opler and Titman (1994) find that firms that maintain a high leverage ratio and have specialized business lines tend to experience more difficulties during economic downturns. Therefore, bank leverage can affect bank governance. We use Leverage ratio as control variables for the risk factors of bank. Leverage is measured as the ratio of total debt to total bank assets. The mean of the Leverage is

$$\mathbf{Leverage}_{i,t} = {total\ debt_{i,t}}\Big/{total\ bank\ asset_{i,t}}$$

The third control variable is non-performance loans (NPL). We measure NPL by using non-performing loans divided by total loans of the bank.

$$NPL_{i,t} = non\ performance\ loans_{i,t}\Big/total\ loans_{i,t}$$

The last control variable is year dummy in order to control the year's effect on the sample.

In table 4, we reported the correlations matrix for the variables used in the model.

Table 3 Summary Statistics

This is summary statistics for China's listed commercial bank from Dec. 2007 to Dec. 2009. All variables are defined in Table 2. This table is include the mean value (Mean) within the sample, the standard deviation (SD) of observations, lowest and highest observation (Min and Max), and number of observations (N).

Variable	N	Mean	SD	Min	Max
Bank Performance					
ROE	42	0.16643	0.04943	0.03744	0.30029
Corporate Governance Variables					
BS	41	16.04878	1.80210	11.00000	19.00000
BS_sq	41	260.73170	56.82958	121.00000	361.00000
PED	41	0.51127	0.23735	0.13333	1.00000
PID	41	0.34802	0.06871	0.22222	0.63636
Meeting	42	10.40476	4.21993	5.00000	24.00000
State	42	0.78571	0.41530	0.00000	1.00000
Top1	42	27.47679	19.35140	5.90000	67.53000
Top1_sq	42	0.11205	0.14889	0.00348	0.45603
Csh	42	36.33341	11.67285	14.31000	60.40000
CEOpay	41	15.84365	0.71692	14.44252	17.23586
Control Variables					
Size	42	27.77086	1.39497	25.04754	30.09785
Leverage	42	0.93960	0.02297	0.86929	0.97796
NPL	42	0.00016	0.00009	0.00004	0.00056

5.3 The Econometric Model

To test our hypothesis, we build the following models to examine the impact of corporate governance on performance of China's listed commercial banks. We address the relationship between bank governance and performance by using a two-stage least-squares regression (2SLS) to solve the endogeineity problem. We also compare the results to OLS model.

5.3.1 OLS model

$$\begin{aligned} Bank\ Performance_{i,t} = {} & \beta_0 + \beta_1 BS_{i,t} + \beta_2 BS_{sq_{i,t}} + \beta_3 PED_{i,t} + \beta_4 PID_{i,t} + \beta_5 Meeting_{i,t} \\ & + \beta_6 State_{i,t} + \beta_7 Top1_{i,t} + \beta_8 Top1_{sq_{i,t}} + \beta_9 Csh_{i,t} + \beta_{10} CEOpay_{i,t} \\ & + \beta_{11} Size_{i,t} + \beta_{12} Leverage_{i,t} + \beta_{13} NPL_{i,t} + yeardummy + \varepsilon_{i,t} \end{aligned} \quad (1)$$

Where the β parameters are the estimated coefficients for the constant and each of the explanatory variables included in the model, and $\varepsilon_{i,t}$ is an error term. In equation (1), the primary dependent variable (***Bank performance***$_{i,t}$) in the regression is ROE, which presents the ratio of return on equity of bank i at time t. The independent variables include board size and composition, board independence and functioning, ownership structure, CEO compensation, and several control variables. All variables are defined in Table 2.

5.3.2 2SLS model

Previous studies suggest that some of our independent variables such as executive compensation might be determined simultaneously with the dependent variable (bank performance). The executive compensation might arise endogenously as a function of other variables, such as bank performance, board size, ownership concentration. Holthausen and Larcker (1993) find a positive relationship between board size and executive compensation. Therefore, we need to use this panel data and an econometric method to solve the well-known engogeneity problem. We use two-stage least-squares regression (2SLS) to deal with the causality of the empirical relationship.

$$CEOpay_{i,t} = \beta_0 + \beta_1 ROE_{i,t} + \beta_2 BS_{i,t} + \beta_3 PID_{i,t} + \beta_4 State_{i,t} + \beta_5 Top1_{i,t} + \beta_6 Top1_{sq_{i,t}} + \beta_7 Csh_{i,t} + \beta_8 Leverage_{i,t} + yeardummy + \varepsilon_{i,t}$$

$$\begin{aligned} Bank\ Performance_{i,t} = {} & \beta_0 + \beta_1 BS_{i,t} + \beta_2 BS_{sq_{i,t}} + \beta_3 PED_{i,t} + \beta_4 PID_{i,t} \\ & + \beta_5 Meeting_{i,t} + \beta_6 State_{i,t} + \beta_7 Top1_{sq_{i,t}} + \beta_8 Csh_{i,t} + \beta_9 CEOpay_{i,t} \\ & + \beta_{10} Size_{i,t} + \beta_{11} Leverage_{i,t} + \beta_{12} NPL_{i,t} + yeardummy + \varepsilon_{i,t} \end{aligned} \quad (2)$$

Where the β parameters are the estimated coefficients for the constant and each of the explanatory variables included in the model, and $\varepsilon_{i,t}$ is an error term. In equation (2), the endogenous variable related to bank performance is CEOpay, which is the natural logarithm of the sum of top3 executives' pay of the bank I at the end of year t. the primary dependent variable ($Bank\ performance_{i,t}$) in the regression is ROE, which present the ratio of return on equity of bank i at time t.. The independent variables include board size and composition, board independence and functioning, ownership structure, CEO compensation, and several control variables. All variables are defined in Table 2.

6. REGRESSION RESULTS AND DISCUSSION

6.1 Multivariate Analyses

In this section, we employ 2SLS model in our regression and compare the results with the OSL model, when we control the endogeneity problem. Our purpose is not only to facilitate the comparability of our results with previous researches but also to show the results of China's listed commercial banks during the financial crisis by extending the examination of banks performance to an emerging market. Table 5 and Table 6 show the results of OLS and 2SLS regression respectively for the correlation between corporate governance and bank performance. The results are basically consistent with our hypothesis. In Table 5, we use bank governance variables as discussed earlier, controlling for size, leverage, NPL and year in column (2) to (6). The results are consistent with each column shown in the Table 4. However, when the 2SLS procedure is used to solve the endogeneity problem shown in Table 6, the significant effects of Meeting on bank performance disappears, which indicates that OLS regression of bank performance on corporate governance mechanisms may be misleading in some way and demonstrates the empirical superiority of 2SLS over OLS model. Moreover, other results of OLS model are similar to 2SLS model. Thus, we focus on the results of 2SLS model as followings. On board size, the results show that there is a negative relationship between BS_sq and ROE ratio at level in table 6, which is consistent with our hypothesis 1, This result, consistent with that of Andres and Vallelado (2008), implies an inverted U-shaped relation between board size and ROE ratio. Thus, the negative and significant coefficient of BS_sq shows that there is a point at which adding a new director reduces bank value. The result is rather surprising and contrary to studies conducted by Jensen (1993), Lipton & Lorsch (1992), who view that there exists a linear relationship between board size and ROE. However, this confirms that in China larger boards are better for bank performance up to a certain limit during financial crisis, because the oversized boards will destroy the bank value and outweigh their advantages (Yermack, 1996).

On board composition and board independence, the study shows that the association between the proportion of executive directors and ROE is not significant. However, the results suggest that the relationship between proportion of independent directors and ROE is positive significant at level 5%, which indicates that the more independent directors there are on a bank's board will improve the performance, but too many independent directors also will destroy the bank values. Such a relationship establishes an optimum point at which the proportion of independent directors on the board destroys value. The result is consistent with our Hypothesis 2, which also confirms an inverted U-shaped relation between the proportion of independent directors and ROE. It confirms that the impact of proportion of independent directors on bank performance is a trade-off between advantages and disadvantages. Thus, an optimum mix of executive and independent directors is more adequate to create value for the banks than excessively independent boards (Andres and Vallelado, 2008).

On a functioning of boards, the results suggest that there is no impact on the number of board meetings on ROE, which is not consistent with our hypothesis 3. The result is contrary to studies conducted by Jensen (1993), Lipton & Lorsch (1992).

On ownership structure, the results of the study suggest that the banks whose controlling shareholder is the state is more significant positively related to ROE than other banks at level 1%, which is consistent with hypothesis 4. Moreover, the association between Top1_sq and ROE is significant positive at 1%, while the impact of Csh on ROE is significant negatively in the overall sample at level 5%. The results are contrary to our

Table 4 Pearson correlation coefficients

Note: pearson correlation matrix correlations with corporate governance and bank performance and control variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 ROE	1.0000													
2 BS	0.1422	1.0000												
3 BS_sq	0.1365	0.9976*	1.0000											
4 PED	-0.0753	-0.3751*	-0.3587*	1.0000										
5 PID	0.0939	-0.4038*	-0.3674*	0.4505*	1.0000									
6 Meeting	0.1923	-0.0119	-0.0221	-0.3765*	-0.2174	1.0000								
7 State	0.1959	-0.0186	-0.0172	-0.3265*	0.0808	-0.0746	1.0000							
8 Top1	-0.0347	0.1027	0.0882	-0.7348*	-0.3914*	0.1142	0.3696*	1.0000						
9 Top1_sq	-0.1202	0.0776	0.0629	-0.6850*	-0.3936*	0.1050	0.3221*	0.9840*	1.0000					
10 Csh	-0.1228	0.0489	0.0547	-0.1377	0.2558	0.1027	0.4218*	-0.0077	-0.0467	1.0000				
11 CEOpay	-0.0607	-0.1294	-0.1355	0.0598	-0.1878	0.0636	-0.5537*	0.0962	0.1731	-0.5528*	1.0000			
12 Size	0.3101*	0.2634	0.2643	-0.6804*	-0.1758	0.3245*	0.2440	0.6642*	0.5862*	0.2108	-0.0406	1.0000		
13 Leverage	0.4565*	0.0322	0.0477	0.0872	0.2587	0.1368	-0.1068	-0.1208	-0.1671	-0.1873	0.2043	0.3640*	1.0000	
14 NPL	0.0035	-0.0510	-0.0496	-0.1498	-0.2262	0.1523	-0.0480	0.2658	0.2520	0.0007	0.0490	0.2416	0.0244	1.0000

Table 5 Coefficients of OLS regressions showing relation between bank governance and performance

This table shows OLS regression results that investigate the impacts of governance structure on China's listed commercial bank performance. The sample consists of China's listed commercial banks over the period of Dec. 2007–Dec. 2009, which is the period in the financial crisis. The dependent variable in the regression is ROE, which is the ratio of return on average equity. The independent variables in regressions include the board size (BS), the square of the number of board directors (BS_sq). proportion of executive directors variable (PED), proportion of independent directors variable (PID), The number of meetings held by board (Meeting), the dummy variable (State) that equals 1 if a majority of the firm's stock is in the hand of state, and 0 otherwise, Ratio of Shares held by the largest shareholder to total shares (Top1), the square of the shareholding from the largest shareholder (Top1_sq), the variable (CSh) the concentration of shareholder's holding from 2nd to 10th. The variable (CEOpay) is the natural logarithm of the sum of top3 executives' pay of the bank. The control variable is bank size, leverage, and NPL. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. p-value in parentheses.

$$Bank\ Performance_{i,t} = \beta_0 + \beta_1 BS_{i,t} + \beta_2 BS_{sq_{i,t}} + \beta_3 PED_{i,t} + \beta_4 PID_{i,t} + \beta_5 Meeting_{i,t} + \beta_6 State_{i,t} + \beta_7 Top1_{i,t} + \beta_8 Top1_{sq_{i,t}} + \beta_9 Csh_{i,t} + \beta_{10} CEOpay_{i,t} + \beta_{11} Size_{i,t} + \beta_{12} Leverage_{i,t} + \beta_{13} NPL_{i,t} + yeardummy + \varepsilon_{i,t} \quad (1)$$

Ind. V.:	(1)		(2)		(3)		(4)		(5)		(6)	
ROE	Coef.	t (P>t)	Coef.	t (P>t)	Coef.	t (P>t)	Coef.	t (P>t)	Coef.	t (P>t)	Coef.	t (P>t)
BS	0.1126	1.92*	0.1274	2.28**	0.1305	2.32**	0.1426	2.45**	0.1485	2.44**	0.0618	2.89***
		(0.065)		(0.031)		(0.028)		(0.022)		(0.022)		(0.008)
BS_sq	-0.0031	-1.71*	-0.0037	-2.1**	-0.0038	-2.13**	-0.0041	-2.26**	-0.0043	-2.26**	0.0019	-2.69**
		(0.098)		(0.045)		(0.042)		(0.032)		(0.033)		(0.013)
PED	0.0758	1.46	0.0771	1.57	0.0897	1.75*	0.0858	1.66	0.0935	1.75*	0.0519	1.86*
		(0.154)		(0.127)		(0.091)		(0.108)		(0.093)		(0.075)
PID	0.3279	2.55**	0.2693	2.16**	0.3061	2.33**	0.3389	2.46**	0.2946	2.2**	0.1355	2.65**
		(0.016)		(0.039)		(0.028)		(0.021)		(0.037)		(0.014)
Meeting	0.0048	2.88***	0.0035	2.07**	0.0038	2.19**	0.0037	2.13**	0.0041	2.3**	0.0017	2.47**
		(0.007)		(0.047)		(0.038)		(0.043)		(0.03)		(0.021)
State	0.0695	3.29***	0.0752	3.73***	0.0819	3.8***	0.0851	3.87***	0.0790	3.54***	0.0222	3.92***
		(0.003)		(0.001)		(0.001)		(0.001)		(0.002)		(0.001)
Top1	0.0086	3.88***	0.0054	2.11**	0.0056	2.17**	0.0054	2.07**	0.0054	2.03*	0.0026	1.99*
		(0.001)		(0.044)		(0.039)		(0.048)		(0.053)		(0.058)
Top1_sq	-1.1360	-4.23***	-0.8296	-2.84***	-0.8855	-2.95***	-0.8742	-2.9***	-0.8458	-2.72**	0.3012	-2.75**
		(0.000)		(0.008)		(0.006)		(0.008)		(0.012)		(0.011)
Csh	-0.0018	-2.61*	-0.0022	-3.15***	-0.0024	-3.22***	-0.0025	-3.26***	-0.0024	-3.06***	0.0007	-3.25***
		(0.014)		(0.004)		(0.003)		(0.003)		(0.005)		(0.003)
CEOpay	0.0259	2.08**	0.0216	1.81*	0.0261	2.01*	0.0273	2.09**	0.0221	1.58	0.0136	1.79*
		(0.047)		(0.081)		(0.054)		(0.047)		(0.126)		(0.086)
Size			0.0161	2.11**	0.0216	2.2**	0.0217	2.2**	0.0201	2.00**	0.0097	1.98*
				(0.044)		(0.036)		(0.037)		(0.056)		(0.059)
Leverage					-0.3673	-0.89	-0.4004	-0.97	-0.2878	-0.66	0.4229	-0.88
						(0.379)		(0.343)		(0.513)		(0.387)
NPL							58.7915	0.85			80.7419	1.63
								(0.4)				(0.117)
yeardummy										yes		yes
_cons	-1.5310	-2.75**	-1.9120	-3.44***	-1.8360	-3.26***	-1.9409	-3.35***	-1.9613	-3.3***	0.5947	-3.7***
		(0.01)		(0.002)		(0.003)		(0.002)		(0.003)		(0.001)
F-		4.44		4.93		4.55		4.21		3.88		4.04
Prob > F		0.0008		0.0003		0.0005		0.0009		0.0015		0.0012
R-squared		0.605		0.6593		0.6691		0.6782		0.6849		0.7162
Adj R^2		0.4688		0.5255		0.5221		0.5173		0.5085		0.5389

Table 6 Coefficients of 2SLS regressions showing relation between bank governance and performance

This table shows 2SLS regression results that investigate the impacts of governance structure on China's listed commercial bank performance. The sample consists of China's listed commercial banks over the period of Dec. 2007–Dec. 2009, which is the period in the financial crisis. The dependent variable in the regression is ROE, which is the ratio of return on average equity. The independent variables in regressions include the board size (BS), the square of the number of board directors (BS_sq), proportion of executive directors variable (PED), proportion of independent directors variable (PID), The number of meetings held by board (Meeting), the dummy variable (State) that equals 1 if a majority of the firm's stock is in the hand of state, and 0 otherwise, Ratio of Shares held by the largest shareholder to total shares (Top1), the sum square of the shareholding from these largest shareholders (Top1_sq), the variable (CSh) the concentration of shareholder's holding from 2nd to 10th. The variable (CEOpay) is the natural logarithm of the sum of top3 executives' pay of the bank. The control variable is bank size, leverage, and NPL. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. p-value in parentheses.

$$CEOpay_{i,t} = \beta_0 + \beta_1 ROE_{i,t} + \beta_2 BS_{i,t} + \beta_3 PID_{i,t} + \beta_4 State_{i,t} + \beta_5 Top1_{i,t} + \beta_6 Top1_{sq_{i,t}} + \beta_7 Csh_{i,t} + \beta_8 Leverage_{i,t} + yeardummy + \varepsilon_{i,t}$$

$$Bank\ Performance_{i,t} = \beta_0 + \beta_1 BS_{i,t} + \beta_2 BS_{sq_{i,t}} + \beta_3 PED_{i,t} + \beta_4 PID_{i,t} + \beta_5 Meeting_{i,t} + \beta_6 State_{i,t} + \beta_7 Top1_{sq_{i,t}} + \beta_8 Csh_{i,t} + \beta_9 CEOpay_{i,t} + \beta_{10} Size_{i,t} + \beta_{11} Leverage_{i,t} + \beta_{12} NPL_{i,t} + yeardummy + \varepsilon_{i,t} \quad (2)$$

Ind. V.:		(1)		(2)		(3)		(4)
ROE	Coef.	t (P>t)	Coef.	t (P>t)	Coef.	t (P>t)	Coef.	t (P>t)
BS	0.1397	2.18**	0.1529	1.95*	0.1513	1.98*	0.1913	2.36**
		(0.037)		(0.061)		(0.058)		(0.027)
BS_sq	-0.0041	-2.06**	-0.0044	-1.81*	-0.0044	-1.84*	-0.0056	-2.2**
		(0.049)		(0.081)		(0.078)		(0.038)
PED	0.0310	0.6	0.0566	0.86	0.0583	0.94	0.0668	1.06
		(0.556)		(0.395)		(0.354)		(0.301)
PID	0.2443	1.72*	0.3471	1.87*	0.3192	1.86*	0.4194	2.25**
		(0.095)		(0.072)		(0.074)		(0.034)
Meeting	0.0021	1.12	0.0025	1.09	0.0026	1.23	0.0029	1.34
		(0.271)		(0.285)		(0.229)		(0.191)
State	0.1039	3.64***	0.1440	3.27***	0.1265	2.92***	0.1428	3.21***
		(0.001)		(0.003)		(0.007)		(0.004)
Top1_sq	-0.2811	-3.33***	-0.4254	-3***	-0.3696	-2.66**	-0.4062	-2.89***
		(0.002)		(0.006)		(0.013)		(0.008)
Csh	-0.0021	-2.58**	-0.0026	-2.48**	-0.0026	-2.73**	-0.0027	-2.74**
		(0.015)		(0.019)		(0.011)		(0.011)
CEOpay	0.0399	1.79*	0.0742	2.08**	0.0565	1.58	0.0656	1.85*
		(0.084)		(0.047)		(0.126)		(0.076)
Size	0.0259	3.64***	0.0424	3***	0.0383	2.78**	0.0378	2.74**
		(0.001)		(0.006)		(0.01)		(0.011)
Leverage			-1.0213	-1.48	-0.8037	-1.15	-1.0027	-1.41
				0.151		(0.26)		(0.171)
NPL							185.6108	1.69
								(0.104)
yeardummy						yes		Yes
_cons	-2.4502	-3.39***	-2.6724	-3***	-2.4524	-3.09***	-2.8247	-3.35***
		(0.002)		(0.006)		(0.005)		(0.003)
F		4.01		2.67		2.61		2.5
Prob > F		0.0016		0.0178		0.0181		0.0222
R-squared		0.5377		0.3408		0.4847		0.4823
Adj R^2		0.3782		0.0818		0.227		0.1923

hypothesis 5.Theoretically, top1_sq is expected to have a negative impact on the bank performance and Csh is a positive effects. However, the results are opposite to our hypothesis. One possible reason for the interest finding of China's listed commercial banks during the financial crisis may be related to China's macroeconomic policies and government intervention at this special time. It shows the fact that the bank will benefit more when holding of the largest shareholding is appropriate. However, it leads the ownership concentration to exacerbate more agency conflicts, specifically between bank owners and bank depositors, when the largest shareholder holds too many shares of the bank. In this situation, the large shareholder may be against the interests of minority shareholders and induce the moral hazard behavior. The results indicate that the association between shareholding of the largest shareholder and bank performance is inverted U-shape during the financial crisis. In addition, the results show that the shareholding of other large shareholders has a negative impact on bank performance, which implies that the other large shareholders cannot monitor the largest shareholder effectively during financial crisis, which might be different from the other periods.

The study points to the fact that executive's pay has a positive impact on bank performance. This is significant at level 10% in the overall sample as the results indicate. Compensation contracts are therefore seen as a remedy to the principal agent problem. Besides this, short term and long term incentive plans benefit shareholders by incentivizing managers to perform better in their own interests. Furthermore, our results suggest that at least in China's banking, the incentive of executive's pay is directly linked to bank performance. The executive's compensation plays an important role in affecting the efficient incentive mechanisms, which inevitably enhances performance.

6.2 Robust Check

This section presents additional tests to examine the effects of bank governance on performance, and investigate whether the main findings are robust to alternative specifications. ROE is the most common measure of performance in corporate governance literatures, and we also use another accounting-based performance measure ROA (return on assets) to repeat the analysis in OLS and 2SLS regression model. Both of ROA and ROE are widely used as a measure of bank performance in studies on the banking industry (Cornett, Ors, & Tehranian, 2002; Magnan & St-Onge, 1997). Table 7 shows our results of robust check for changes in the dependent variable, the results of OLS regression are presented in Panel A and the results of 2SLS regression are presented in Panel B. The specification yielded equivalent results to those presented in Table 5 and Table 6, excepting Hypothesis 6. In general, this specification does not qualitatively modify our primary findings.

7. CONCLUSIONS AND FUTURE RESEARCH AGENDA

Since the global economies have been significantly shaken all over the world, banks corporate governance become more important for stability and profitability of the banking sector. There is little study in the literature that has examined the effects of corporate governance on bank performance in emerging markets during the economic crises. This study employs China's listed commercial bank data from Dec. 2007 to Dec. 2009.

In sum, our results suggest that how corporate governance affects China's listed commercial bank performance during financial crisis depends heavily on the country's

Table 7 Coefficient estimates from OLS and 2SLS regressions of ROA on bank governance
This table shows OLS and 2SLS regression results that investigate the impacts of bank governance on China's listed commercial bank performance. The sample consists of China's listed commercial banks over the period of Dec. 2007–Dec. 2009, which is the period in the financial crisis. The dependent variable in the regression is ROA, which is the ratio of return on average assets. The independent variables and control variables are defined in table 2. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. p-value in parentheses.

Ind. V.:	Panel A: OLS		Panel B: 2SLS	
ROA	Coef.	t (P>t)	Coef.	t (P>t)
BS	0.00669	2.18**	0.00736	1.93*
		(0.039)		(0.066*)
BS_sq	-0.00019	-2.00*	-0.00021	-1.78*
		(0.057)		(0.087)
PED	0.00410	1.59	0.00251	0.84
		(0.125)		(0.408)
PID	0.01156	1.72*	0.01386	1.58
		(0.099)		(0.127)
Meeting	0.00024	2.81**	0.00018	1.71*
		(0.01)		(0.099)
State	0.00291	2.64**	0.00527	2.52**
		(0.014)		(0.019)
Top1	0.00026	2.01*		
		(0.056)		
Top1_sq	-0.03857	-2.58**	-0.01601	-2.42**
		(0.017)		(0.023)
Csh	-0.00006	-1.55	-0.00007	-1.53
		(0.134)		(0.14)
CEOpay	0.00088	1.31	0.00254	1.52
		(0.204)		(0.141)
Size	0.00073	1.51	0.00157	2.42**
		(0.145)		(0.023)
Leverage	-0.13156	-6.26***	-0.15723	-4.68***
		(0.000)		(0.000)
NPL	4.80003	1.2	7.16732	1.38
		(0.244)		0.179
yeardummy		Yes		yes
_cons	0.02798	0.95	0.00072	0.02
		(0.354)		(0.986)
F		5.5		3.71
Prob > F		0.0001		0.0021
R-squared		0.7745		0.6305
Adj R^2		0.6336		0.4236

institutional background. On board, the regression results show that an inverted U-shaped relation between board size and bank performance, and between the proportion of independent directors and bank performance. This result strengthens the hypothesis that the incorporation of outsiders improves bank value up to a certain limit. This is important to perform efficiently and it should advise more independence in boards to monitor the manager,

but too many independent directors face considerable problems of coordination, communication and decision making. In view of this, during the financial crisis we suggest to increase the proportion of independent directors and ensure their professional quality in China up to a certain limit. Thus, in order to establish independent, efficient boards and enhance internal monitor mechanisms, an optimum mix of executive and independent directors is more adequate to create value for the banks than excessively independent boards during financial crisis.

However, Evidence indicates that there is a significant negative association between the executive director and bank performance, while the board composition rather pointed out that the more independent the board is, the worse the profitability of overall sample.

On ownership structure, Evidence indicates that there is a more significant positive association between State-owned banks and bank performance than non-state owned banks. In addition, we find that the ownership concentration is negatively related to performance of listed commercial banks in China. This indicates that ownership concentration can destroy bank value in emerging markets, where agency problems are far more severe and where monitoring by banks is compromised by the legal environment. In this situation, it may adjust the ownership structure to improve the corporate governance, therefore enhancing the operational efficiency.

On executive compensation, the study points to the fact that a significant positive relationship exits between executive compensation and bank performance. Our results suggest that at least in China's banking system, executive's pay is directly linked to bank performance. In order to reduce the principal agent problem, it should establish a rational compensation mechanism and this incentive plan benefits shareholders by incentivizing managers to perform better in their interests. Furthermore, our results suggest that in China's banking system, the executive's compensation plays an important role in affecting the efficient incentive mechanisms, which inevitably enhances performance.

Given the evidence on corporate governance and bank performance in emerging markets, an important future extension of the current study will be to compare the difference in bank governance mechanism or the important factors that affect bank performance between developed and developing countries.

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