Research on Modern Higher Education 2, 01004 (2017)
DOI: 10.24104/rmhe/2017.02.01004

Empirical research on risk taking of listed financial institutions based on the perspective of corporate governance

Chen Hao*
China Academy of Corporate Governance, Nankai University, Tianjin, China
Business School, Nankai University, Tianjin, China

Guangyao Cui, Xinrui Liu & Sibo Gui
Business School, Nankai University, Tianjin, China

ABSTRACT: After the financial crisis in 2008, the risk control of financial institutions has once again become the focus of attention. This paper selects the unbalanced panel data of 44 listed financial institutions in China from 2009 to 2013 for empirical analysis to study the risk taking of China's listed financial institutions based on the perspective of corporate governance. Then the paper analyzes the effect of corporate governance on the risk taking of listed financial institutions based on the empirical analysis from four aspects. The results indicate that there is a significant negative correlation between the proportion of the largest shareholder's shareholding and risk taking; a significant positive correlation between the size of the board of supervisors and risk taking; a significant positive correlation between the executive pay and risk taking, and a significant negative correlation between the equity incentive and risk taking. By comparison, the factors related to governance of board of directors have no significant effect on the risk taking of listed financial institutions.

Keywords: Listed financial institutions; risk taking; corporate governance

1 INTRODUCTION

Financial institutions which are engaged in financial service are an important part of the financial system. They provide financial services for the society, and play an important role in the market economy. Stable operation and development of financial institutions are very significant to the whole financial system and the smooth running of the national economy. As the financial industry has the characteristics of high risk, high leverage and relevance, which is different from the general industry, financial institutions tend to "affect the situation as a while" in the event of problems. So the risk control of financial institutions is very essential.

Review of recent financial crisis, we can be aware that the occurrence of crisis is usually due to the lack of proper risk control. Financial institutions take on too much risk which leads them to face bankruptcy crisis, and then the crisis spreads to the whole society. With modern social economic and financial globalization speeding up, the financial crisis spreads more quickly, which requires that financial institutions should continue to strengthen risk control and to guarantee the stability of the business.

Further thinking, we can realize that the key to strengthen risk control of financial institutions is to establish and improve the effective corporate governance mechanism, which can reduce the possibility of financial institutions to undertake inappropriate risk and ensure the stable and safe operation and the development of financial institutions.

At present, China's financial industry is in a period of rapid development. More attention should be paid on improving corporate governance mechanism so as to reduce the operation risk, thus guarantee the healthy and stable development of China's financial industry.

This paper analyzes the relationship between corporate governance and risk taking of China's listed financial institutions based on the perspective of corporate governance, which is helpful for us to understand how corporate governance influences risk taking,

*Corresponding author: nkhaochen@163.com

and to provide certain empirical evidence for China's listed financial institutions to strengthen risk control and improve corporate governance.

The remainder of the paper is structured as follows. Section 2 presents a literature review on corporate governance and risk taking, and proposes the research hypotheses. Section 3 describes the samples and variable construction. Section 4 provides the empirical results and the robustness of the results. Finally, Section 5 concludes the paper.

2 LITERATURE REVIEW AND HYPOTHESES

Existing related research which studies the relationship between corporate governance and risk taking mainly based on one or few aspects of the governance of shareholders, the governance of the board of directors and executive incentive. This literature review also includes the above three aspects.

In terms of shareholder governance, scholars at home and abroad primarily focus on how the ownership concentration influences the risk taking. The impact has two aspects. On one hand, ownership concentration can effectively restrain the risk taking. In the beginning, corporate governance is put forward to solve the principal-agent problem between owners and managers. When the ownership is dispersed, small-sized and medium-sized shareholders lack motivation and ability to supervise managers, which may cause "insider control" to harm the interests of shareholders. Therefore concentrated ownership is helpful to reduce the agency cost between owners and managers. While on the other hand, the agency cost between large-sized shareholders and minority shareholders has arisen with the improvement of ownership concentration. Large-sized shareholders may take on too much risk for high return regardless of high risk which the company, small-sized and medium-sized shareholders, and other stakeholders have to face. Laeven and Levine (2009) consider a sample of 270 banks in 48 countries. They find that bank risk taking varies positively with the comparative power of shareholders within the corporate governance structure of each bank. And they find a significant positive relation between the cash flow rights of the largest shareholder of the bank and bank risk taking. Scholars of China consider different bank samples and find that there is a significant positive correlation between the proportion of the largest shareholder's shareholding and risk taking of China's banks (e.g., Kong and Dong, 2008; Cao and Niu, 2009; Cao and Wang, 2010). Eling and Marek (2013) analyze the impact of factors related to corporate governance on risk taking in the insurance industry. And they find that more blockholders are associated with lower risk taking, which is different from the result of bank research. Chinese Scholars consider different samples of insurance companies and securities companies and find a same significant negative correlation (e.g., Xia and Jin, 2013; Chen and Lin, 2013).

In terms of the governance of the board of directors, existing related studies mainly focus on the efficiency of the board of directors, through regulating the size of the board, improving the independence of the board or other methods to make the board play a positive role in corporate governance. The board size affects the board efficiency directly, thus affecting the companies' risk taking. Lipton and Lorsch (1992) and Jensen (1993) discover that the efficiency of smaller size of the board is higher, and the size of the board will reduce its efficiency. While the research conclusion of scholars of China is opposite, different scholars consider different bank samples but find out the same conclusion that the size of the board of directors is negatively related to risk taking (e.g. Wang et al., 2007; Kong and Dong, 2008; Cao and Niu, 2009). Huang and Wang (2014) find out the negative impact of board size on risk of firms. The research on the relationship between the independence of the board of directors and risk taking is mainly based on the perspective of the proportion of independent directors and duality of manager and chairman. Byrd et al. (2001) find that the perspective of the proportion of independent directors is negatively related to risk taking. They believe that independent directors can supervise managers' risk behaviours better and put forward some professional advice to control risk taking. Bhagat and Black (2002) agree with their results but for different interpretation. They believe that independent directors attach great importance to maintain their reputation in directors' market. Eling and Marek (2013) consider a sample of the insurance industry in UK and Germany and find out that the strengthening of the independence of the board can reduce the risk taking of insurance companies. Zagorchev and Gao (2015) consider a sample of financial institutions in U.S. between 2002 and 2009 and find that greater board independence is related to lower risk-taking. Cao and Niu (2009) and Xia and Jin (2013) consider samples of Chinese financial institutions and find out the same conclusion that there is a significant negative correlation between the proportion of independent directors and risk taking. In terms of the duality of manager and chairman, Jensen (1993) find that the duality may make the board inefficient, while Simpson and Gleason (1999) consider a sample of banks and find out the duality will reduce the possibility of bank crisis. Pathan (2009) considers a sample of 212 American banks from 1997 to 2004, and the results show that the duality can reduce the risk taking of banks.

In terms of executive incentive, domestic and international scholars chiefly concentrate on how different executive incentive mechanisms influence the risk taking. Bhagat and Bolton (2014) study the executive compensation structure in 14 of the largest U.S. financial institutions during 2000-2008 and their results are mostly consistent with and supportive of the findings

of Bebchuk, Cohen and Spamann (2010), that is, managerial compensation incentive leads to excessive risk taking. Based on the perspective of executive pay, Cao and Niu (2009) and Wei (2012) consider samples of Chinese city commercial banks and find out higher executive pay is related to lower risk taking, while Zhang et al. (2014) conclude that there is a significant positive correlation between the level of executive pay and risk taking. Based on the perspective of equity incentive, Saunders et al. (1990) find that equity incentive may increase risk taking of banks. Low (2009) also finds out equity incentive increases companies' risk. And scholars of China also draw the same conclusion (e.g. Cao and Wang, 2010; Wei, 2012).

To sum up, the research conclusion of scholars at home and abroad is divergent because of the difference of selected samples and periods. This paper tries to focus on the risk taking of China's listed financial institutions based on a more comprehensive perspective of corporate governance, involving various types of financial institutions.

On the basis of the contents discussed above, we put forward the following research hypotheses:

H1: the proportion of the largest shareholder's shareholding is negatively related to the risk taking;

H2: the size of the board of directors is negatively related to the risk taking;

H3: the proportion of independent directors is negatively related to the risk taking;

H4: the size of the board of supervisors is negatively related to the risk taking;

H5: the level of the executive pay is negatively related to the risk taking;

H6: the equity incentive is negatively related to the risk taking.

3 SAMPLES AND VARIABLE CONSTRUCTION

This section mainly describes the samples and variable construction, and then provides summary statistics of main variables.

3.1 *Samples and data source*

This paper considers a sample of all listed financial institutions in China. We define the financial industry as all financial institutions consisting of commercial banks, insurance companies, securities companies, and trust companies or other financial institutions, as classified by *Industry Classification Guidance of Listed Companies* published by China Securities Regulatory Commission (CSRC) in 2012. We select 44 listed financial institutions consisting of 16 commercial banks, 4 insurance companies, 19 securities companies, and 5 trust companies or other financial institutions, as shown in Table 1.

Our main source of data is China Stock Market & Accounting Research Database (CSMAR), supplemented by hand-collected data from annual reports of listed financial institutions. Our sample spans the period 2009 to 2013. This process yields an unbalanced panel of 206 firm-year observations.

Table 1. List of financial institutions

No.	Stock code	Corporate name
1	000001	Ping An Bank Co., Ltd.
2	000562	HongYuan Securities Co., Ltd.
3	000563	Shaanxi International Trust Co., Ltd.
4	000686	Northeast Securities Co., Ltd.
5	000712	Golden Dragon Share Co., Ltd.
6	000728	GuoYuanSecurities Co., Ltd.
7	000750	Sealand Securities Co., Ltd.
8	000776	GuangFa Securities Co., Ltd.
9	000783	Changjiang Securities Co., Ltd.
10	002142	Bank of Ningbo Co., Ltd.
11	002500	Shanxi Securities Co., Ltd.
12	002673	Western Securities Co., Ltd.
13	600000	Shanghai Pudong Development Bank Co., Ltd.
14	600015	Hua Xia Bank Co., Ltd.
15	600016	China Minsheng Banking Co., Ltd.
16	600030	Citic Securities Co., Ltd.
17	600036	China Merchants Bank Co., Ltd.
18	600109	Sinolink Securities Co., Ltd.
19	600369	Southwest Securities Co., Ltd.
20	600643	Shanghai AiJian Group Co., Ltd.
21	600705	Avic Capital Co., Ltd.
22	600816	Anxin Trust & Investment Co., Ltd.
23	600837	Haitong Securities Co., Ltd.
24	600999	China Merchants Securities Co., Ltd.
25	601009	Bank of Nanjing Co., Ltd.
26	601099	The Pacific Securities Co., Ltd.
27	601166	Industrial Bank Co., Ltd.
28	601169	Bank of Beijing Co., Ltd.
29	601288	Agricultural Bank of China, Ltd.
30	601318	Ping An Insurance (Group) Company of China, Ltd.
31	601328	Bank of Communications Co., Ltd.
32	601336	New China Life Insurance Co., Ltd.
33	601377	Industrial Securities Co., Ltd.
34	601398	Industrial and Commercial Bank of China, Ltd.
35	601555	Soochow Securities Co., Ltd.
36	601601	China Pacific Insurance (Group) Co., Ltd.
37	601628	China Life Insurance Co., Ltd.
38	601688	HuaTai Securities Co., Ltd.
39	601788	Everbright Securities Co., Ltd.
40	601818	China Everbright Bank Co., Ltd.
41	601901	Founder Securities Co., Ltd.
42	601939	China Construction Bank Corporation
43	601988	Bank of China, Ltd.
44	601998	China Citic Bank Co., Ltd.

3.2 *Variable definition*

According to the research hypotheses, we select the variables for the empirical research, and define the variables, as shown in Table 2.

Table 2. Variable definition

Variables	Name	Label	Formula
Dependent variable	Volatility of return on assets	STR	The standard deviation of return on assets
Independent variables	Proportion of the largest shareholder's shareholding	SH1	The proportion of the largest shareholder's shareholding
	Size of the board	BOD	The natural logarithm of the size of the board of directors
	Proportion of independent directors	IDR	The proportion of independent directors in the board of directors
	Size of the board of supervisors	BOS	The natural logarithm of the size of the board of supervisors
	Executive pay	SAL	The natural logarithm of the average annual salary of the top three highest paid executives
	Equity incentive	MOV	The dummy variable, 1 means yes and 0 means no
Control variable	Size of assets	SIZE	The natural logarithm of total assets

3.2.1 *Dependent variable: risk taking*

There are several methods to measure risk taking, but most of them are suited to certain kind of financial institutions. We consider a sample of all listed financial institutions in China, so the method we choose to measure risk taking should be suitable for all kinds of listed financial institutions.

We follow John et al. (2008) and Xie and Tang (2013), and select volatility of ROA as the main measure for financial institutions' risk-taking, because it's available and suitable for all types of financial institutions. So we select the standard deviation of return on assets to measure risk taking of financial institutions.

3.2.2 *Independent variables: corporate governance*

As for the measure of corporate governance, we select 6 important elements of corporate governance as independent variables, which are included in the governance of shareholders, the governance of the board of directors, the governance of the board of supervisors and executive incentive.

In terms of the governance of shareholders, we focus on how the ownership concentration influences the risk taking. We choose the proportion of the largest shareholder's shareholding to measure the ownership concentration.

In terms of the governance of the board of directors, we analyze that how the efficiency and independence of the board of directors influence the risk taking. We choose the size of the board to measure the board efficiency, and choose the proportion of independent directors in the board of directors to measure the board independence.

In terms of the governance of the board of supervisors, we choose the size of the board of supervisors to measure the efficiency of the board of supervisors.

In terms of the executive incentive, we focus on how the executive pay and equity incentive influence the risk taking. We select the average annual salary of the top three highest paid executives to measure the level of the executive pay. As for the influence of equity incentive, we use the dummy variable to tell the difference: 1 means that the company uses equity incentive and 0 means no.

3.2.3 *Control variable*

We follow existing related studies to select size of assets as control variable.

In general, companies with large size of assets can take on more risk. So the size of assets affects risk taking a lot. As a result, we control the differences of size to analyze how corporate governance influences risk taking.

3.3 *Summary statistics*

According to the previous part of the variable definitions, we select the relevant data for empirical analysis. Table 3 presents the summary statistics for all variables. STR has a mean of 0.0127 and a standard deviation of 0.0449, and we can find that the standard deviation is low but the range is wide. SH1 has a mean of 0.3011, which shows that the equity is concentrated as a whole. MOV has a mean of 0.1942, which means that less than 1/5 of listed financial institutions have adopted equity incentive.

Table 3. Summary statistics of variables

Variables	Mean	S. D.	Minimum	Maximum
STR	0.0127	0.0449	0.0005	0.4926
SH1	0.3011	0.1652	0.0587	0.6837
BOD	2.5113	0.3229	1.6094	3.0910
IDR	0.3585	0.0419	0.1667	0.5000
BOS	1.8217	0.4424	0.6931	2.5650
MOV	0.1942	0.3965	0.0000	1.0000
SAL	14.3900	0.8969	11.2252	16.6152
SIZE	25.7243	2.8943	16.3402	30.5711

From the specific view, Table 4, Table 5, Table 6, Table 7, and Table 8 provide the annual summary statistics of variables from 2009 to 2013. Through these tables, we can find out the change trend of main variables over time. For example, the mean of SH1 from 2009 to 2013 are 0.2916, 0.2909, 0.2978, 0.3113, and 0.3111 respectively, which show a trend of stead-

ily. Figure 1 shows the change of mean of STR over time, which shows a downward trend in general. Higher STR in 2009 and 2010 reflect that the impact of the financial crisis is still continuing, and lower STR from 2011 to 2013 reflect that China's listed financial institutions have strengthened risk control after crisis.

Table 4. Summary statistics of variables in 2009

Variables	Mean	S. D.	Minimum	Maximum
STR	0.0246	0.0822	0.0015	0.4926
SH1	0.2916	0.1823	0.0629	0.6837
BOD	2.4805	0.3864	1.6094	2.9957
IDR	0.3643	0.0409	0.2667	0.4286
BOS	1.7711	0.4643	0.6931	2.3979
MOV	0.2300	0.4260	0.0000	1.0000
SAL	14.1212	1.2158	11.2252	16.6152
SIZE	25.1626	3.3646	16.3402	30.0979

Table 5. Summary statistics of variables in 2010

Variables	Mean	S. D.	Minimum	Maximum
STR	0.0200	0.0645	0.0005	0.4129
SH1	0.2909	0.1704	0.0629	0.6837
BOD	2.5127	0.3479	1.6094	2.9444
IDR	0.3502	0.0467	0.1667	0.4286
BOS	1.8462	0.4359	1.0986	2.5649
MOV	0.2000	0.4050	0.0000	1.0000
SAL	14.3629	1.0002	11.4592	15.9988
SIZE	25.6495	2.9417	19.8308	30.2306

Table 6. Summary statistics of variables in 2011

Variables	Mean	S. D.	Minimum	Maximum
STR	0.0083	0.0120	0.0011	0.0715
SH1	0.2978	0.1636	0.0587	0.6837
BOD	2.4975	0.3290	1.6094	2.9444
IDR	0.3550	0.0371	0.2857	0.4444
BOS	1.8107	0.4364	1.0986	2.5649
MOV	0.1600	0.3740	0.0000	1.0000
SAL	14.4641	0.8378	11.4592	15.9472
SIZE	25.6735	2.8873	20.6253	30.3704

Table 7. Summary statistics of variables in 2012

Variables	Mean	S. D.	Minimum	Maximum
STR	0.0064	0.0062	0.0011	0.0349
SH1	0.3113	0.1574	0.0776	0.6837
BOD	2.5406	0.2890	1.9459	3.0910
IDR	0.3560	0.0440	0.2500	0.5000
BOS	1.8299	0.4543	1.0986	2.5649
MOV	0.1800	0.3900	0.0000	1.0000
SAL	14.3970	0.7063	12.4781	15.9381
SIZE	25.9047	2.7377	20.6732	30.4956

Table 8. Summary statistics of variables in 2013

Variables	Mean	S. D.	Minimum	Maximum
STR	0.0073	0.0083	0.0024	0.0505
SH1	0.3111	0.1617	0.0608	0.6837
BOD	2.5187	0.2794	1.9459	2.9444
IDR	0.3674	0.0398	0.3333	0.4545
BOS	1.8420	0.4411	1.0986	2.5649
MOV	0.2000	0.4080	0.0000	1.0000
SAL	14.5490	0.6956	12.4689	16.2030
SIZE	26.1085	2.6549	21.1936	30.5711

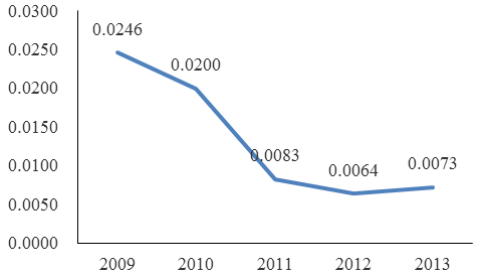

Figure 1. Change of mean of STR over time

4 EMPIRICAL RESULTS

4.1 *Model design*

We select four models to test how the governance of shareholders, the governance of the board of directors, the governance of the board of supervisors and executive incentive influence the risk taking of China's listed financial institutions respectively. Our models are as follows:

$$SDR_1 = \alpha_1 + \beta_{11} SH1 + \beta_{12} SIZE + \varepsilon_1 \quad (1)$$

$$\mathrm{SDR}_2 = \alpha_2 + \beta_{21}\mathrm{BOD} + \beta_{22}\mathrm{IDR} + \beta_{23}\mathrm{SIZE} + \varepsilon_2 \quad (2)$$

$$SDR_3 = \alpha_3 + \beta_{31} BOS + \beta_{32} SIZE + \varepsilon_3 \quad (3)$$

$$\mathrm{SDR}_4 = \alpha_4 + \beta_{41}\mathrm{IDR} + \beta_{42}\mathrm{SAL} + \beta_{43}\mathrm{MOV} + \beta_{44}\mathrm{SIZE} + \varepsilon_4 \quad (4)$$

Model 1 is used to examine the impact of ownership concentration on risk taking. Model 2 is used to examine the influence of the board size and independence on risk taking. Model 3 is used to examine that how the size of the board of supervisors affects risk taking. And Model 4 is used to examine the impact of board independence and executive incentive on risk taking.

4.2 *Correlation analysis*

Table 9 presents the correlation between STR and independent variables according to Pearson, Spearman, and Kendall correlation analysis respectively.

Table 9. Correlation analysis

Variables	Pearson	Spearman	Kendall
SH1	-0.140**	0.510	0.035
BOD	-0.290***	-0.599***	-0.446***
IDR	0.165**	-0.024	-0.020
BOS	-0.111	-0.421***	-0.294***
MOV	-0.070	-0.193***	-0.158***
SAL	-0.401***	-0.310***	-0.210***
SIZE	-0.366***	0.649***	-0.429***

Notes: *, **, and *** indicate significance at the 10%, 5% and 1% levels, respectively.

We can find that each independent variable has a

certain significant correlation with STR, which inflects that these independent variables are all important factors to influence risk taking of financial institutions.

4.3 *Regression results*

We use the unbalanced panel data of 44 listed financial institutions in China from 2009 to 2013 for empirical analysis to study the risk taking of China's listed financial institutions based on the perspective of corporate governance. Table 10 presents the results of the regression analysis.

Based on the results of F-test and Hausman test, we use the fixed effects (FE) estimator and find out several statistically significant relations. As shown in Table 10, we find a negative and statistically significant relation between SH1 and risk taking from Model 1, a positive and statistically significant relation between BOS and risk taking from Model 3, and a positive and statistically significant relation between SAL and risk taking and a negative and statistically significant relation between MOV and risk taking from Model 4. In addition, we find a negative and statistically significant relation between SIZE and risk taking. While the factors related to governance of board of directors have no significant effect on the risk taking of listed financial institutions. The results verify H1 and H6 but reject H2, H3, H4, and H5.

Table 10. Regression results

Variables	Model 1	Model 2	Model 3	Model 4
SH1	-0.2031 (0.00)***			
BOD		0.0164 (0.56)		
IDR		0.0354 (0.66)		0.0642 (0.40)
BOS			0.1117 (0.00)***	
SAL				0.0120 (0.09)*
MOV				-0.0296 (0.05)**
SIZE	-0.0232 (0.00)***	-0.0272 (0.00)***	-0.0250 (0.00)***	-0.0313 (0.00)***
_cons	0.6707 (0.00)***	0.6576 (0.00)***	0.4515 (0.00)***	0.6289 (0.00)***
R-sq	0.4035	0.3164	0.4049	0.3484
F test	0.0000	0.0000	0.0000	0.0000
Hausman test	0.0000	0.0000	0.0000	0.0000

Notes: Coefficients are provided with P-value below in parenthesis; *, **, and *** indicate significance at the 10%, 5% and 1% levels, respectively.

4.4 *Robustness test results*

We also use STR lag 1 as the dependent variable for the robustness test. Table 11 presents the results of the robustness test.

As shown in Table 11, SH1 is negatively related to the risk taking; BOS is positively related to the risk taking; SAL is positively related to the risk taking; and MOV is negatively related to the risk taking. The main results are the same and verify the robustness of the empirical results.

Table 11. Robustness test results

Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**
SH1	-0.0750 (0.09)*			
BOD		0.0396 (0.16)		
IDR		-0.0823 (0.29)		-0.0639 (0.38)
BOS			0.0425 (0.07)*	
SAL				0.0235 (0.00)***
MOV				-0.0072 (0.09)*
SIZE	-0.0230 (0.00)***	-0.0263 (0.00)***	-0.0233 (0.00)***	-0.0350 (0.00)***
_cons	0.6214 (0.00)***	0.6135 (0.00)***	0.5299 (0.00)***	0.5951 (0.00)***
R-sq	0.1592	0.1540	0.1715	0.1250
F test	0.0000	0.0000	0.0000	0.0000
Hausman test	0.0000	0.0088	0.0000	0.0000

Notes: Coefficients are provided with P-value below in parenthesis; *, **, and *** indicate significance at the 10%, 5% and 1% levels, respectively.

5 CONCLUSIONS

After the financial crisis in 2008, there has been unprecedented attention to the issue of governance of financial institutions. As the industry benchmark of China's financial industry, the governance of listed financial institutions is related to its competiveness and sustainable development. In this paper, we consider a sample of 44 China's listed financial institutions from 2009 to 2013 for empirical research and find out the bigger proportion of largest shareholder's shareholding and equity incentive can guarantee the healthy and stable development of financial institutions. While the governance of the board of directors and the governance of the board of supervisors still need to be improved.

So we suggest that the listed financial institutions should strengthen the governance of the board of directors and the board of supervisors by improving their independence and professionalism.

Specifically, the board of directors and the board of supervisors should control the board size for communicating efficiently. After that, independent directors, outside supervisors and other independent mechanisms should fully play their roles to improve the board independence. More professional committees help companies make more scientific decisions. Thus the mechanism of checks and balances can be really propitious to the steady and healthy development of financial institutions.

Besides, we insist that China's listed financial institutions should optimize their executive incentive mechanisms by establishing the appropriate incentive mechanisms which should take the short-term performance and long-term development of the company into account. At the same time, financial institutions can supply managers a number of stock or stock options to motivate them to achieve a win-win situation.

ACKNOWLEDGEMENT

We thank the support of the National Natural Science Foundation Projects of China (71132001), and the assistance of Major Project of Foundation of Humanities and Social Sciences of China's Ministry of Education (14JJD630007).

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