The effect of equity incentives on earnings management and firm performance

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Abstract

Good incentive mechanism design system can effectively relieve the conflict of the company's principle-agent relationship. Equity incentives is a double edged sword for earnings management and firm performance .We conduct a study on the relationship of executive incentives, earnings management and firm performance. The results indicate that: (1) the proportion of managerial ownership has a reversed U-shape relationship with the firm performance; (2)the proportion of managerial ownership has no significant relationship with earnings management.

Keywords

Equity incentives, Earnings Management, Firm performance

1. Introduction

Managers' equity incentives has been widely used in management practice in every country. Equity incentives is an effective way for firms to achieve the long-term incentive to the management. It makes the management and the firm share the consistent interest and solves the agency problem in the listed companies effectively. The principle-agent theory holds that the interest relationship between the managers and shareholders can be integrated through the equity incentives and the contradiction of the separation of ownership and management right can be solved to a certain extent, and helping to achieve the goal of maximizing value of the firm .Equity incentives has been thought as the ''Golden Key'' in solving the principle-agent problems of companies in the late 20th century. It makes great efforts to improve the performance of companies and the working efficiency of management. As equity incentives was introduced late in china, lots of methods have been proposed to improve the effect of stock option incentive plan in listed companies.Due to the equity incentives tend to require the company's performance index, company's management exist motivations of earnings management to meet the vesting conditions in the face of the temptation of equity incentives, even accounting fraud and damage the interests of ordinary investors.Equity incentives has significant effects on earnings management.

As a long-term incentive system, whether equity incentives can restrict earnings management and improve business performance? And whether the executives in the listed company can create a higher firm value and the purpose of conducting earnings management is to enhance the value of the firm on the basis of the firm's strategy or to damage the firm's value in order to make the private wealth maximize is also the issue this paper intends to deal with.

The remainder of the study is organized as follows: Sect. 2 discusses the literature and hypotheses.Sect. 3 introduces the variables and the models. Sect. 4 describes data resources, descriptive statistics, and discusses empirical findings and additional test results. Sect. 5 offers a conclusion.

2. Literature and hypotheses

In the principle-agent relationship, due to the asymmetry information and inconsistency target between the shareholders and executives, shareholders guide and supervise the managers by the way of incentive and restraint behavior. The equity incentives makes executives share profits and bear risk,

so managers pay more attention to the long-term interests of firms. The emergence of earnings management, on one hand may be the economic means used by managers to maximize the general interest; on the other hand may create opportunity for managers to conduct the earnings management behavior, namely damage the interests of investors for their own benefit. Equity incentives and earnings management are complementary to each other.

There have been many studies about the relationship between equity incentives and earnings management. Warfield et al. (1995) [1] found that the managerial ownership was negatively correlated to absolute value of discretionary accrual. Bergatresser and Philippon (2006) [2]found that the greater proportion of shares and options held by CEO accounted for the total remuneration, the more significant degree of earnings management. Bums and Kedia (2006) [3]compared corrected financial report with uncorrected match companies and concluded that the implementation of equity incentives would increase risk of revising the financial report.Chen Qianli (2008)[4] pointed out that the excessive equity incentives not only lead to more serious earnings manipulation and regulatory pressure, but also created opportunities for large shareholders to occupy the interests of small shareholders. Huang Junfeng (2008) [5] argued that equity incentives was a double-edged sword. Li Yanxi (2007) [6] adopted regression analysis showed that manager remuneration was positively related to a height adjusted accruals. Luo Mei et al (2010) [7] argued that executives would not increase the degree of earnings manipulation for performance evaluation and incentive mechanism. At present, more and more firms implement equity incentives plan, the general earnings information has an important reference value in evaluating executives. Generally speaking, the earnings information is proportional to the executive compensation.Therefore, we put forward the following hypothesis:

H1:The higher proportion of managerial ownership,the higher degree of earnings management.That is the proportion of managerial ownership has a linear positive correlation with the degree of earnings management of listed companies.

Jensen (1990) [8] believed that the firm performance is positively related to the proportion of internal shareholding.France and Smith argued that the executives' shareholding was conducive to overcome the short-term behavior and improve the performance of firms. The study of Hall and Liebman(1998) [9]has showed that there was a positive correlation between the executives' remuneration and firm performance by analyzing relational data from 475 companies between 1980 and1994in the USA.W-type relationship was revealed between managerial shareholding and the free cash flow improved business performance.Davieset al. (2005) [10] has indicated that there is non-linear relationship between the value of the firm and managerial holdings.WushuKun (2002) [11] observed that managerial ownership and firm performance appeared inverted "U" type relationship.XuDawei (2005)[12] indicated that when the proportion of managers' shareholding at 7.50% or less and more than 33.35%, it was positively correlated to firm performance, while intermediate ratio is negatively correlated. Also someone suggested that shareholding of managers and firm value did not exist "range effect".Xia Jijun (2008)[13] empirical evidence proved that equity incentives effect was not significant, or even negative in China's listed state-owned firms.Qu Liang et al (2010) [14] believed that the proportion of managerial ownership had a positive linear correlation with firm performance, which did not exist nonlinear relationship.(2014)[15] believed that executive salary was significantly associated with firm size rather than performance, while exist significantly regional differences. BaipeiWen(2009) [16] considered controlling shareholders of listed companies encroach other shareholders and firm interests by the means of "rent-seeking".Morek et al [17] found that firm performance improved with the increasing proportion of executive ownership , up to a certain point and then declined.Relevant literature has given to prove, and then combined with our analysis, we argue that with the proportion of managerial ownership gradually increasing, the level of executive efforts are also increasing,firm performance will increase;When the proportion reaches a certain point, the firm performance reaches the maximum.If further increase the proportion of executive ownership ,executives are bound to be actual controller of the firm, then the executives has both control and manage right ,which will enhance their value and harm the interests of other minority

shareholders through a variety of means and methods. Therefore, we put forward the following hypothesis:

H2: The proportion of managerial ownership has a reversed U-shape relationship with the firm performance.

3. Data and econometric model

The samples consist of all manufacturing industry firms listed in Shanghai and Shenzhen from 2009 to 2014, and the data were collected from CCER and Wind databases. The firms in the financial sector were excluded because of their unique accounting procedures and regulations. After eliminating incomplete data, our final sample consisted of 2295 firm-year observations.This paper mainly uses SPSS18.0 and EXCEL as statistical software.

3.1 Variable definitions

In China, the implementation of equity incentive is still relatively simple, the main way is shares and options, and because the issue of disclosure data, so we select proportion of managerial ownership (STOCK) to measure the level of equity incentive.

The company's performance index, previous studies mainly choose the Tobin's Q value (stock market index) and net profit, earnings per share (accounting index). Among them,foreign scholars mostly used Tobin's Q, which mainly reflects the firm's future profitability.However, due to Chinese listed companies on the stock market is not very robust, and its stock price deviates from the value, and reset value of the assets is difficult to estimate.On the stock market,the real traded proportion of the total shares is very small, Tobin's Q can't truly reflect the enterprises performance. Therefore, we adopt financial indexes of companies total assets profit rate (ROA) to measure business performance.

In general, discretionary accrual is regarded as an alternative variable to the earnings management. This paper intends to use the separation model of accrued items to measure the earnings management. In a large number of separation models, Jones (1991) model is considered to be a more accurate method to measure discretionary accruals.

The supervision power of shareholders to the enterprise is related to the proportion of its own stock ownership.If the ownership highly concentrated, the major shareholder of the firm exists absolute control right, they have the power to choose talents serve as general manager. Therefore, we select the largest shareholder stake (LAST) as control variable of the model.

The independence of the board can be measured by whether chairman of the board also serve as general manager.Combine the two positions into one will increase the extent of earnings management. If they are independent, they will supervise and restraint each other, which will have a certain binding to the degree of earnings management. So we select the chairman and general manager position setting (DUA)as a control variable of the model.

Governance structure and political cost are often related to the scale of firms. The greater the size of the firm, the better its governance structure, the better its incentive system. In this paper, we use the natural logarithm of total assets (SIZE) to represent the scale of firms.

Most of state-owned listed companies are monopoly industries and controlled by insiders, due to the intervention and supervision of government, the level of governance is relatively weak and the stability of financial indicators is low.

ROE, select this variable is mainly consider performance level executives carry out the rate of return on equity as the standard in large part. In addition, ROE is capital market motivation for earnings management.At present, China's securities market regulations concerning listed companies issue shares, allotment are related to ROE . Therefore, we chose the ROE indicators as control variables of the model.

Table 1 The definitions of each variable

	Definition
Dependent variables	
Return on assets (ROA)	Earnings before interest after taxes divided by average total assets
Earnings management(EM)	The discretionary accruals (DA) estimated through the modified Jones model (Dechow et al.1996)
Explanatory variable	
Equity incentives (STOCK)	The shareholding ratio of all senior management personnel
Control variables	
The largest shareholder stake(LAST)	The ratio of the first largest shareholder to the total shares
Board structures(DUA)	The CEO duality dummy; if a board chairman is also the CEO, then the value is 1; otherwise, the value is 0
Controlling shareholder category(STATE)	State -owned holding 1, non state-owned holding 0
Company size(SIZE)	The natural logarithms of the total assets of a firm
Asset-debt ratio(DEBT)	The ratio of debt to total assets
Rateof return on net assets (ROE)	The ratio of net profit to net assets

3.2 Models

The model of the relationship between equity incentives and earnings management:

$$EM = \alpha_0 + \alpha_1 STOCK + \alpha_2 LAST + \alpha_3 DUA + \alpha_4 STATE + \alpha_5 SIZE + \alpha_6 DEBT + \alpha_7 ROE + \varepsilon \quad (1)$$

(2).The model of the relationship between equity incentives and firm performance

$$ROA = \beta_0 + \beta_1 STOCK + \beta_2 STOCK^2 + \beta_3 LAST + \beta_4 DUA + \beta_5 STATE + \beta_6 SIZE + \beta_7 DEBT + \beta_8 ROE + \delta \quad (2)$$

4. Empirical results and analysis

4.1 Descriptive statistics of samples

Table 2 shows the descriptive statistics for the sample. The means for ROA are 2.798.The means and median for stock are 7.30% and 6.87%.There is a big gap between the minimum and the maximum. These indicate that the intensity gap of equity incentives is large, the scope of equity incentives is smaller, and the proportion of incentive is mostly concentrated between 1% and 10%, which shows that China's equity incentives is still in initial stage. The mean of earnings management (EM) is basically concentrated in the 1.7(more than one), which indicating that China's firms exist earnings management behavior, but to a lesser extent. This paper selects the largest shareholder's ownership

(LAST) as control variables of the model. As shown in Table 2, the mean of the largest shareholder's ownership is 37.4512%; the maximum is 86.3105%;the minimum is 1.2013.Due to the special nature of China's national conditions and economic policies, state-owned account for a large proportion. The natural logarithm of total assets (SIZE) represent firm size, the mean is23.5719； the maximum and minimum are 27.0112 and 20.5491, respectively .Firm size will affect corporate governance structure and political cost. Asset-liability ratio (DEBT) affect performance and earnings management。The mean of DEBT is 0.5101, greater than 0.5, which indicates that executives can make better use of liabilities to improve performance. The mean of ROE is 0.1290, maximum and minimum values are 0.8043 and -2.1163, respectively.

Table 2 Descriptive statistics

Statistics variable	Mean	Minimum	Maximum	Median
STOCK	7.3	0.000	18.96	6.87
ROA	2.798	0.8146	10.6534	6.702
EM	1.7	0.012	1.863	1.759
LAST	37.4512	1.2013	86.3105	32.7133
DUA	0.188	0	1	0
STATE	0.6111	0	1	0
SIZE	23.5719	20.5491	27.0112	23.1346
DEBT	0.5101	0.0782	1.297	0.5347
ROE	0.0494	-3.0365	0.7109	0.0562

4.2 T test of earnings management

Discretionary accruals (DA) can be calculated by amended Jones (Jones) regression model, while the absolute value can represent the earnings management level of sample companies. If the firm exists earnings management behavior,discretionary accruals (DA) is different from zero,otherwise,does not exist (Healy, 1990). In order to verify the existence of earnings management behavior, we need do single sample T-test for earnings management (EM). The results are shown in Table 3.

DA and EM are significantly different from zero, which mean that earnings management and discretionary accruals have passed the test, indicating that earnings management behavior of listed companies is widespread.Due to the research model of earnings management, confirm the existence of earnings management can ensure the validity of the analysis.

Table 3 T test of single sample for earnings management

	Test Value = 0				
t	df.	Sig.(Bilateral)	Mean Difference	99% Confidence Internal of the difference	
				Lower	Upper
DA 28.414	250	.000	.166781243	.15014169	.17168962
EM 3.227	250	.005	.019682812	.00171532	.4079541

4.3 The multicollinearity test between independent variables and dependent variables

In order to test the linear relationship between equity incentives and earnings management, incentives and firm performance, we need to do multicollinearity test and regression analysis for them.If there is a multiple linear in the regression model, will greatly affect the model explanatory power.Therefore, we need test the degree of multicolinearity before the empirical test. In this paper, we use Pearson test method to test variables, the test are shown in Table 4.

Table 4 Multicollinearity result of explanatory variables and control variables

	STOCK	LAST	DUA	STATE	SIZE	DEBT	ROE
STOCK	1	-.227	.079	-.328	-.242	-.158	.060
LAST		1	-.0 51	.298	.317	.121	.047
DUA			1	-.171	-.102	-.110	.035
STATE				1	.197	.201	-.092
SIZE					1	.354	.115
DEBT						1	-.208
ROE							1

From table 4 we can see that the maximum of correlation coefficient between each explanatory variable and the control variable is 0.328, and the most correlation coefficients are less than 0.3. The test results show that there is no linear problem between the variables, so the regression results of the model will not have a negative effect.

4.4 The linear regression analysis of the relationship between equity incentives and earnings management

As can be seen from Table 5, in the case of a significant level of 5%, the F value of the model (1) is 2.311;Adjusted R^2 is 0.017, which shows that the model has a certain statistical significance.The regression coefficient of LAST is 0.145, indicates that it can pass the test under the significant degree of 1%;But managerial ownership (STOCK), board structures (DUA), the controlling shareholder category (STATE), company size (SIZE), asset-liability ratio (DEBT), net profit to net assets (ROE) is not significant and does not pass the test.

In the model, the proportion of managerial ownership (STOCK) can't explain the degree of earnings management. The reason is that the proportion of executives can only indirectly affect the earnings management, and is not the main component (EM).Relatively low Adjusted R^2 will not affect the accuracy of results; the regression analysis is a very normal result.The proportion of managerial ownership (STOCK) is 0.073, the significance level is 0.375, and the H1 can't be proved.

Table 5 Linear regression results of model 1

Variables	coefficient	T value	Sig.
Constant	.329*	2.298	.018
STOCK	.073	.769	.375
LAST	.145***	3.513	.002
DUA	-.001	-.061	1.023

STATE	-.01	-.938	.295
SIZE	-.005	-1.513	.207
DEBT	.003	.068	.894
ROE	.051	1.597	.092
	Adjusted R^2	.017	
	F test	2.311*	
	P value	.032	

The numbers in parentheses are p values. ***, **, and * representing significance levels at 1, 5, and 10 %, respectively.

4.5 The curve regression analysis of the relationship between executive equity incentives and firm performance

As can be seen from Table 6,at the level of 1%,the constant ,the proportion of managerial ownership (stock), the size of the company (SIZE), assets and liabilities rate (DEBT), the net profit on net assets rate (ROE) pass the test and their regression coefficients are 10.003, 8.011, -0.356, -1.522, 0.803;.At the level of 1%, the square ($STOCK^2$), the board of directors structure (DUA) pass the test, their regression coefficient are -20.169, -0.356;The relationship between LAST with firm performance is not significant. The coefficient of executive's shareholding ratio's square (stock) is negative, which is consistent with what we expected. Managerial ownership and firm performance have a "U "-typed relation.With the increasing proportion of shareholding corporate performance improve in a certain range, when the executive shareholding reaches a certain level, firm performance reaches maximum value. At this time if we raise the degree of equity incentive, corporate performance will decline, so that hypothesis H2 is established.So the proportion of managerial ownership should also have an appropriate range, but not the higher the better, lower equity shock cannot play a role in encouraging, but too high will reduce the firm performance.

The effect of equity incentives on corporate performance is more significant. In order to achieve the maximization of firm performance, in the study of the relationship between equity incentive and firm performance, corporate have to prevent the high proportion of managerial ownership.Once reach,he will become the actual controlling shareholder. The management of firm once commands by the controlling shareholders, they may use their control right damage the corporate performance by the means of "rent seeking" and "tunneling".

Table 6 Curve regression results of model 2

Variables	coefficient	T value	Sig.
Constant	10.003***	8.989	.000
STOCK	8.011***	3.513	.002
$STOCK^2$	-20.169**	-2.872	.002
LAST	.010	.024	.933
DUA	-.356**	-2.911	.005
STATE	-.082	-.695	.491
SIZE	-3.27***	-7.107	.000

DEBT	-1.522***	-4.974	.001
ROE	.803 ***	3.619	.000
	Adjusted R^2	.183	
	F test	20.979***	
	P value	.000	

The numbers in parentheses are p values. ***, **, and * representing significance levels at 1, 5, and 10 %, respectively.

5. Robustness tests

In order to verify the robustness of the relevant variables in the analysis of the paper, the robustness of relevant factors is required to test: First,needs to test the sensitive of control variables, namely eliminate the model of control variables and then conduct regression analysis; Second, using Tobin's Q instead of total assets profit rate (ROA) to measure corporate performance. At last, compare the results of the two regression test.

5.1 Elimination of control variable

In order to test robustness and reliability of the empirical research, we must exclude control variables due to the influence on variables.We again do the research of regression analysis based on eliminating of financial indicators control variables and corporate governance control variables.The regression test is shown in Table 7.

Model (1) study the impact of managerial ownership on earnings management,which is not significant and pass the test. But the coefficient of the variable is positive, which is consistent with the above analysis result.The proportion of managerial ownership does not constitute a major part of discretionary accrual, which only indirectly affects earnings management determined by other variables. But we're still affirming the result of the study.

Tale 7 The regression analysis results of the control variables are removed.

Variables	Coefficient	T values	Sig.
Constant	.162***	29.873	.000
STOCK	.082	.898	.327
	Adjusted R^2	.000	
	F test	.938	
	Sig.	.321	

The numbers in parentheses are p values. ***, **, and * representing significance levels at 1, 5, and 10 %, respectively.

Table 8 shows that in the case of significant degree not change, Adjusted R^2 greatly decreased, but coefficient of executives shareholding ratio squared is negative, which consist with front analysis result .So that the analysis conclusion is robust.

Tale 8 The regression analysis results of the control variables are removed.

Variables	Coefficient	T values	Sig.
Constant	1.899***	39.992	.000

STOCK	11.243***	5.462	.000
$STOCK^2$	-30.451***	-4.719	.000
	Adjusted R^2	.056	
	F Test	20.437***	
	Sig.	.000	

The numbers in parentheses are p values. ***, **, and * representing significance levels at 1, 5, and 10 %, respectively.

5.2 Using Tobin's Q to test the robustness of firm performance

In order to test validate of analysis results, we use Tobin' Q to measure firm performance instead of ROA, again on the model (2) do regression analysis.

As can be seen from Table 9, in case of the significant degree of the model do not change , Adjusted R^2 decreased, but the coefficient of managerial ownership (STOCK) square is negative, and regression coefficients in the quadratic and change of coefficients are smaller in magnitude. Analysis results and above conclusions is basically same, so that the conclusions of this paper are good. The relationship between equity incentives and earnings management is not significant, which did not pass the test, and indicates that the executives of listed companies do not have a strong desire to get more stock.

6. Research conclusions and Countermeasures.

In this paper, we draw lesson from home and abroad, select the proportion of managerial ownership and discretionary accruals calculated by Jones modified model as proxies for equity incentives and degree of earnings management, while firm performance measured by profit of total assets of listed companies.On this basis, we conduct empirical test of equity incentives' influence on earnings management and corporate performance. Through the empirical test and analysis , the following conclusions are reached:First, the relationship between the shareholding proportion of executives and earnings management is not significant, indicating that the executives of listed companies do not have a strong desire to get more equity in current stage ;Second,the proportion of managerial shareholding and firm performance appears an inverted "U" type, namely,with the equity incentive level gradually rise, firm performance is decrease after goes up first. When equity incentives reach a certain extent, firm performance will be maximized. Overall, the proportion of management shareholding too low would not achieve incentive effect, and too high could lead executives make use of "rent-seeking" and other means for their own interests.

We propose the following measurement and suggestion:First,equity incentives should be combined with the enterprise management objectives and performance evaluation;Second,expand the scope of the implementation of equity incentive;Third,perfect the corporate governance structure.All in all, in order to make the interests of executives and shareholders agreement, we should consider the long-term development of enterprises and establish reasonable measures, standardized management system and improve the market environment, it was possible to improve the level of performance, effectively control earnings management, and thus enhance the company's performance.

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