The Impact of Equity Incentives on Firm Performance

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Abstract. Based on principal-agent theory, this paper explores whether equity incentives can improve firm performance, and then investigates the relationship between equity incentives, earnings management and firm performance, using a sample of A-share listed companies in Shanghai and Shenzhen listed between year 2011 and 2020. The empirical results show that the implementation of equity incentives in listed companies can significantly improve firm performance; and equity incentives can significantly promote earnings management, which plays a role partly in mediating the effect between equity incentives and firm performance. The investigation further finds that equity incentives are more effective in improving firm performance in firms with low management performance and financing constraints when other factors are equal. This finding helps companies to use earnings management appropriately to strengthen internal control, and set up different incentive plans according to management performance and financing constraints to improve company performance.

Keywords: Equity Incentives; Firm Performance; Earnings Management; Mediating Effects.

1. Introduction

One of the most prominent features of modern companies is the separation of rights. The emergence of a principal-agent relationship aims to improve specialized economies and diversify the risks of firms, but at the same time it can lead to high agency costs and affect the efficiency of resource allocation which cause wastes of resources, and is harmful to interests of stakeholders. By giving a certain percentage of equity to the company's executives (professional managers), implementing equity incentives can strengthen the benefit sharing and risk sharing between the executives and shareholders, prompt them to make the corporate strategy from the shareholders' perspective, thus alleviating the agency problem and improving the firm performance. In management practice around the world, the impact of equity incentives is not entirely satisfactory, for example, the control of corporate executives over the company is increased by their high shareholding, and the risk of conflicts of interest with the company's shareholders are also increased. During this period, company executives also know more internal information about the company, resulting in information asymmetry. Company earnings has an impact on share prices, and executives have an incentive to manipulate the company's accrued profits for earnings management. Therefore, the impact of earnings management in equity incentives and company performance is also attached great importance.

To sum up, this research took Shanghai and Shenzhen A-share listed companies listed between year 2011 and 2020 as the sample to test the impact of equity incentives on company performance and to explore the mediating role of the degree of earnings management in the relationship between equity incentives and company performance, and to analyse companies under different levels of management and financing constraints to provide a reference for the issue of equity incentives for listed companies in China.

2. Research Hypothesis

In the process of business operation, owners and professional managers' goals are not fully aligned due to the separation of rights, which may give rise to principal-agent risk, which is one of the reasons that hinder the improvement of company performance. The implementation of equity incentives in companies can make executives and shareholders become a community of interest and participate in decision-making as shareholders, thus effectively curbing agency costs, avoiding the occurrence of

moral hazard and the problem of adverse selection, and improving the performance of the company (Sarka, 2014). Secondly, according to human capital theory, human resources are a special form of capital that plays a key role in economic growth, and companies can attract talents and enhance the motivation and initiative of management by implementing equity incentives. Therefore, a reasonable incentive mechanism can fully stimulate the effectiveness of executives' human capital, and equity incentives are one of the effective incentive tools in accordance with the conditions (Bao Yiying, 2021).

By allocating residual ownership to managers, the company bundles their interests with those of the company, which helps to stimulate human capital effectiveness and improve corporate governance, thereby enhancing corporate performance. Based on the above analysis, this paper proposes the following hypothesis.

Hypothesis 1: Equity incentives significantly improve firm performance.

Earnings management is not an act of financial fraud, but rather an autonomous judgement on the quality of accounting information using professional financial knowledge within the limits allowed by accounting standards. Thus, earnings management does not violate accounting standards, and its flexible use of professional judgement to adjust the earnings interferes with the judgement of stakeholders and the outcome of remuneration contracts, thereby maximising corporate interests (Ning, Yaping, 2004). Engaging in earnings management, managers can pass on information given to the company internally to other stakeholders and affect the capital cost of the firm. Earnings management smoothes the profits of the firm from year to year and can promote the long-term development of the firm. In periods of poor business conditions, the earnings management behaviour of corporate managers increases current profits and smoothes the rate of return in each period, which can enhance investors' confidence in investment and maintain a good image of the company's profitability, which is beneficial to the long-term development of the company (Chen, Yiyun, 2009).

Meanwhile, equity incentives will induce management to implement earnings management. Zhu Xingwen et al. (2008) suggest that managers have an incentive to increase their own compensation through increased earnings management when managers' salary is linked to the accounting performance of the firm. Lin, Dapang and Su, Dongwei (2010) argue that equity incentives may induce incentives for executives to engage in surplus management, for example by whitewashing financial statements to adjust favourable performance indicators. In summary, this paper argues that by giving executives equity incentives that link their personal interests to the performance of the company, executives are more likely to manipulate earnings management, while adjusted company information is conducive to enhancing investor confidence and may promote the development of the company. Based on the above analysis, this paper proposes the following hypotheses.

Hypothesis 2: Equity incentives can improve firm performance by promoting corporate earnings management and hence corporate performance.

The impact of equity incentives on companies with different levels of management varies. Li Xingchang (2016) suggests that the high level of cash flow management reflects the overall operation and management level of the company. For companies with a low level of management, which are cash-strapped and have pressure to pay salaries, the use of equity incentives can, to a certain extent, replace cash compensation, save cash expenses and have a more significant impact on company performance. Thus the less cash flow a company has, the more inclined it is to choose an equity incentive plan (Yermark, 1995), and the more sensitive it is to equity incentives. Based on the above analysis, this paper proposes the following hypothesis.

Hypothesis 3a: Equity incentives significantly contribute to improve corporate performance in companies with lower management performance compared to companies with better management performance.

Financing constraints are capital market frictions that prevent firms from accessing exogenous financing or make exogenous financing too costly, forcing firms to forego favourable investment opportunities (Chen, Zuohua et al., 2018).Denis and Sibilkov (2010) argue that in firms with constrained financing, their shareholder-manager agency problems weaken, the marginal value of

cash assets can effectively increase, and capital The financing constraint in the market can inhibit managers' on-the-job consumption behaviour and over-investment. Therefore, for firms with high levels of financing constraints, the risk of agency problems is low and their incentive to choose equity incentives due to agency prevention is weakened, resulting in equity incentives being insignificant for firm performance; for firms with low levels of financing constraints, due to their easier access to external financing, the agency problems between management and shareholders are relatively prominent and equity incentives become an effective means of resolving agency problems, thus better improving performance. Based on the above analysis, this paper proposes the following hypotheses.

Hypothesis 3b: Equity incentives significantly contribute to improved firm performance in less financing-constrained firms compared to more financing-constrained firms.

3. Method

3.1 Sample Selection and Data Sources

This paper selects listed companies in Shanghai and Shenzhen A-shares from 2011-2020 as the initial research sample. In order to ensure accurate and reasonable data, this paper refers to existing literature to process the sample as follows: (1) eliminate samples with missing data; (2) eliminate outliers, such as sample points where some values in the sample significantly deviate from the remaining values; (3) due to the accounting standards and operating characteristics, there are significant differences between financial and non-financial companies, so companies in the financial and insurance sectors were excluded; (4) companies that were ST,* ST during the study period were excluded; (5) to eliminate the influence of extreme values on the study results, all continuous variables in this paper were subjected to tailoring below 1% and above 99% of the quantile. A total of 22,231 valid samples were finally collected

The data for this paper was sourced from the Guotaian CSMAR database and the data processing was done by Excel and Stata 16.0.

3.2 Variable Definitions

3.2.1 Core Explanatory Variables

In this paper, the ratio of executive shareholding, i.e. the ratio of total shareholding of executives to total share capital, is used as a proxy variable for equity incentives. Senior executives as referred to in this paper include managers, deputy managers and financial officers of the company, the secretary of the board of directors of the listed company and other persons as specified in the company's articles of association.

3.2.2 Explained Variables

In existing researches, the financial indicators to measure corporate performance vary and can be divided into two main categories. One category reflects accounting performance indicators, such as earnings per share (EPS), which not only reflects a company's profitability level, but is also an important indicator of a company's performance (Huang Guitian & Zhang Yue, 2008); return on total assets (ROA) can indicate that a company can create more profits with the same level of total asset size, and return on net assets (ROE) rate can reflect both the comprehensive efficiency of a company's capital use and can show the efficiency of a company's use of paid-in capital, both of which are equally accurate measures of a company's performance level (Yang, Hualong et al., 2016). Another category of indicators is to reflect market performance indicators, such as Tobin's Q, which is commonly used by many foreign scholars to measure the performance of companies. But for domestic studies, Tobin's Q does not reflect the company's earnings well to a certain extent because in the stock market, the company's share price does not accurately measure the company's value.

Therefore, this study refers to the studies of Huang Guitian and Zhang Yue (2008) and Yang Hua-Ling et al. (2016) and selects earnings per share (EPS) as the variables in the main regression in this

study. In addition, return on total assets (ROA) and return on net assets (ROE) are used in this study for robustness testing to ensure the reliability of the results.

3.2.3 Control Variables

Drawing on previous research, this study introduces a range of firm-level variables that are cash level (Cash), growth (Grow), total asset turnover (Tat), gearing ratio (Debt), concentration of shareholding (Con) and company size (Lnsize). In addition, this paper controls the effects of year and industry, among which the industry classification is based on the Guidelines on Industry Classification of Listed Companies issued by the China Securities Regulatory Commission.

The definition notes for the above variables are shown in Table 1.

Table 1. Definition of variables

Variable type	Variable name	Variable symbols	Formula or description
Explained variables	Earnings per share	EPS	Earnings per share
Explanatory variables	Equity incentives	Ms	Number of shares held by executives/total share capital
Control variables	Cash levels	Cash	Net operating cash flow for the period/total assets
	Growth	Grow	Increase in operating revenue/total operating revenue in the previous year
	Total asset turnover ratio	Tat	Operating income/total assets closing balance
	Gearing ratio	Debt	Total liabilities/total assets
	Concentration of shareholding	Con	Sum of the top three shareholders' shareholdings
	Company size	Lnsize	Natural logarithm of total assets
	Annual	Year	Annual dummy variables
	Industries	Ind	Industry classification published by the CSRC

3.3 Model

3.3.1 Baseline Regression Model

In order to test whether equity incentives of listed companies in China have a positive impact on company performance, this study uses EPS as the explanatory variable, the ratio of executive shareholding to total equity as the explanatory variable, cash level, growth, total asset turnover, gearing, concentration of shareholding and company size as control variables. Fixed effects are year and industries. A benchmark model is shown in equation (1) as follows.

$$EPS_{it} = a_0 + a_1 Ms_{i,t} + a_2 Cash_{i,t} + a_3 Grow_{i,t} + a_4 Tat_{i,t} + a_5 Debt_{i,t} + a_6 Con_{i,t} + a_7 Lnsize_{i,t} + \sum Year + \sum Ind + u_{i,t} \quad (1)$$

where i represents an individual, t represents time, a_0 represents the constant term and $u_{i,t}$ represents the error term.

4. Results and Data Analysis

4.1 Descriptive Statistical Analysis

Table 2 demonstrates descriptive statistics for the key variables. Earnings per share (EPS) has a mean value of 0.370 and a median value of 0.267, both within a reasonable range. The mean value of

executive shareholding (Ms) is 0.061, indicating to some extent that the percentage of executive shareholding of listed companies in China will be around 6% during the period 2011-2020. The minimum value of executive shareholding (MS) is 0, referring that some companies do not have an executive shareholding programme, while the maximum value is 0.582, showing a general difference in the level of equity incentives between companies.

Table 2. Descriptive statistical analysis of variables

Variables	Number of samples	Minimum value	Maximum value	Median	Average	Standard deviation
EPS	22231	-1.480	2.897	0.267	0.370	0.594
Ms	22231	0.000	0.582	0.001	0.061	0.126
Cash	22231	-0.147	0.235	0.046	0.047	0.067
Grow	22231	-0.674	6.893	0.139	0.387	0.985
Tat	22231	0.078	2.494	0.519	0.616	0.422
Debt	22231	0.059	0.891	0.434	0.439	0.204
Con	22231	0.169	0.856	0.477	0.482	0.153
Lnsize	22231	20.01	26.31	22.15	22.33	1.290

4.2 Regression Analysis

Table 3. Regression results

	(1)	(2)
Ms	0.448***	0.286***
	(5.47)	(3.88)
Cash		1.200***
		(15.08)
Grow		0.034***
		(7.55)
Tat		0.321***
		(10.72)
Debt		-1.147***
		(-21.33)
Con		0.562***
		(6.89)
Lnsize		0.264***
		(17.63)
Intercept distance	0.700***	-5.163***
	(4.87)	(-14.95)
Annual	Control	Control
Industries	Control	Control
Sample size	22,231	22,231
Adjustment of R^2	0.0183	0.174

Note: *, ** and*** indicate significant correlation at the 10%, 5% and 1% levels, respectively. Same as below.

Table 3 demonstrates the impact of equity incentives on firm performance for listed companies in China from 2011-2020, in which column (1) does not include control variables, column (2) introduces firm-level control variables based on column (1). It can be seen that the regression coefficient of executive shareholding (Ms) is significantly positive, indicating that there is a significant positive effect of executive shareholding on firm performance performance of listed companies in China. The

implementation of equity incentives for executive shares in listed companies helps to enhance the management awareness and motivate the proactivity of senior managers, which in turn is conducive to the improvement of company performance, and hypothesis 1 is verified.

For the control variables, the estimated coefficients of cash level (Cash), growth (Grow), total asset turnover (Tat), are all significantly positive, indicating that a high level of cash storage, growth and operational capability of listed companies will enhance their business performance. The regression coefficient of equity concentration (Con) is significantly positive at 1% confidence level, indicating that companies with high equity concentration, where the decision-making right of the company is in the hands of major shareholders, contributing a favourable impact on corporate performance. The regression coefficient of company size (Lnsize) is significantly positive at 1% confidence level, indicating that the increase company size increases the effectiveness of governance and consequently the performance. The regression coefficient of debt ratio (Debt) is significantly negative at 1% confidence level, indicating that companies with higher debt ratios are likely to have lower performance levels.

4.3 Robustness Test Analysis

4.3.1 Indicator Robustness Tests

To safeguard the reliability of the previous empirical analysis, this study conducted three robustness tests in terms of indicator replacement, endogeneity issues, and omitted variables.

This study used return on total assets (ROA) and return on net assets (ROE) as a measure to replace the core explanatory variables. Columns (1) and (2) of Table 4 demonstrate the impact of equity incentives on return on total assets (ROA) and return on net assets (ROE) for listed companies in China, and the regression results are both significantly positive.

At the same time, this paper uses the shareholding (Ts) ratio of directors and supervisors to replace the shareholding (Ms) ratio of executives. Considering that members of the Board of Directors and the Supervisory Board are special senior managers, the higher the shareholding ratio, the higher the incentive level of the company's executives. The regression results are shown in column (3) of Table 4, which shows that the shareholding ratio of directors and supervisors (Ts) is significantly positive at the 1% level, indicating that the positive relationship between equity incentives and firm performance is robust and reliable.

4.3.2 Treatment of Endogeneity

The endogeneity of equity incentives needs to be noted in the regression, i.e., the inverse effect of firm performance on equity incentives: the improvement in the performance of listed companies leads to an increase in the intensity of their equity incentives. To address the possible endogeneity problem between equity incentives and firm performance, this paper introduces the one-period lagged equity incentive variable Lms into the regression of model (4) to mitigate the endogeneity problem between equity incentives and firm performance as much as possible, in order to make the regression results more robust and credible.

Column (4) of Table 4 gives the regression results for model (4) with Lms replacing Ms as the explanatory variable, with a sample size of 18,362 as equity incentives lagged by one period. the regression coefficient for Lms is significantly positive at the 1% confidence level, indicating that equity incentives in the previous year have a lagged effect and the stronger the equity incentive in the previous year, the better the firm's performance in that year. This also indicates that the above empirical regression results are robust and the hypothesis is verified.

Table 4. Robustness tests

	ROA replaces EPS	ROE replaces EPS	Ts replaces Ms	Equity incentive lag of 1 period
	(1)	(2)	(3)	(4)
Ms	0.026***	0.035**		
	(3.04)	(2.00)		
Lms				0.204***
				(2.95)

Ts			0.362***	
			(5.71)	
Cash	0.151***	0.289***	1.207***	1.202***
	(16.26)	(13.41)	(15.13)	(13.45)
Grow	0.004***	0.011***	0.032***	0.035***
	(8.02)	(9.75)	(7.09)	(7.52)
Tat	0.039***	0.082***	0.320***	0.326***
	(11.36)	(9.39)	(10.49)	(9.44)
Debt	-0.183***	-0.362***	-1.217***	-1.203***
	(-29.35)	(-20.86)	(-21.94)	(-19.52)
Con	0.057***	0.132***	0.588***	0.489***
	(7.10)	(7.19)	(6.89)	(5.51)
Lnsize	0.024***	0.056***	0.315***	0.280***
	(15.38)	(13.90)	(19.52)	(16.00)
Intercept distance	-0.429***	-0.998***	-6.199***	-5.648***
	(-11.16)	(-9.50)	(-16.68)	(-14.07)
Annual	Control	Control	Control	Control
Industries	Control	Control	Control	Control
Sample size	22,231	22,231	22,231	18,362
Adjustment of R^2	0.219	0.158	0.186	0.170

4.3.3 Consideration of Omitted Variable Bias

Table 5. Robustness tests

	(1)	(2)	(3)
Ms	0.294***	0.287***	0.285***
	(3.86)	(3.91)	(3.88)
Cash	1.200***	1.198***	1.199***
	(15.08)	(15.09)	(15.08)
Grow	0.034***	0.034***	0.034***
	(7.55)	(7.59)	(7.59)
Tat	0.320***	0.321***	0.320***
	(10.72)	(10.76)	(10.71)
Debt	-1.147***	-1.148***	-1.148***
	(-21.32)	(-21.36)	(-21.34)
Con	0.562***	0.567***	0.562***
	(6.89)	(6.94)	(6.90)
Lnsize	0.264***	0.266***	0.265***
	(17.64)	(17.79)	(17.67)
Merge	-0.006		
	(-0.47)		
Director		-0.007***	
		(-4.37)	
Indrate			0.114**
			(2.34)
intercept distance	-5.163***	-5.141***	-5.213***
	(-14.94)	(-14.84)	(-15.04)
Annual	Control	Control	Control
Industries	Control	Control	Control
Sample size	22,231	22,231	22,231
Adjustment of R^2	0.174	0.175	0.174

Internal governance is one of the most important factors affecting firm performance, in which the combination of two offices can weaken shareholders' investigation of senior management, thus increasing agency costs and affect firm performance (Chu, 2016). A large board hinders communication between directors, while a small board leads to more flexibility in communicating with each other, thus more conducive to efficient decision-making firm development (Singh, 2003); adding more independent directors can improve the internal oversight of the company, thus reducing the possibility of management fraud and promoting the healthy development of the company (Chung, 2003). Above all, this study adds three variables on internal firm governance to the base regression model: Merge (Equals 1 if the chairman of the company also holds the position of managing director, otherwise equals 0), Board Size (Director) (Number of board members) and Indrate (Ratio of the number of independent directors to the total number of directors on the Board). Table 5 shows the relationship between equity incentives and firm performance when omitted variables are considered. According to the regression results, the regression coefficient of equity incentives (Ms) is significantly positive at the 1% level, further indicating the robustness of the study results.

5. Mechanism Analysis

In this study, the degree of accrual earnings management is chosen as a mediating variable to further investigate the mechanism by which equity incentives affect firm performance. The main models for measuring the accrual earnings management are the Healey model, the DiAngelo model, the Jones model, the modified Jones model, the industry model and so on. Guay et al. (1996) analysed the estimation effects of these models above and found that the modified Jones model was the most effective. Therefore this study used the modified Jones model to measure the degree of accrual earnings management (DA). The modified Jones model is.

$$\frac{TA_{i,t}}{A_{i,t-1}} = \beta_0 \frac{1}{A_{i,t-1}} + \beta_1 \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} + \beta_2 \frac{PPE_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t}$$

$TA_{i,t}$ is the total accrual profit of company i in year t, $A_{i.t-1}$ is the total assets of company i at the end of year t-1, $\Delta REV_{i,t}$ is the increase in operating income of company i in year t, $\Delta REC_{i,t}$ is the increase in receivable accounts of company i at the end of year t, and $PPE_{i,t}$ is the fixed assets of company i in year t. Since a positive or negative DA only indicates whether the company is conducting earnings management by using upward or downward adjustments, this study used |DA| to analyse the degree of earnings management.

In order to test whether there is a positive effect of equity incentives on earnings management by listed companies in China, this study used accrual earnings management (DA) as the explanatory variable, and the explanatory and control variables are kept consistent with the underlying regression to construct model (2). In addition, in order to verify whether earnings management is promoted by equity incentives and can further enhance firm performance, the degree of accrual surplus management (DA) is added to model (1) as a mediating variable to build model (3). Models (2) (3) are shown below.

$$DA_{it} = a_0 + a_1 Ms_{i,t} + a_2 Cash_{i,t} + a_3 Grow_{i,t} + a_4 Tat_{i,t} + a_5 Debt_{i,t} + a_6 Con_{i,t} + a_7 Lnsize_{i,t} + \sum Year + \sum Ind + u_{i,t} \quad (2)$$

$$EPS_{it} = a_0 + a_1 Ms_{i,t} + a_2 DA_{i,t} + a_3 Cash_{i,t} + a_4 Grow_{i,t} + a_5 Tat_{i,t} + a_6 Debt_{i,t} + a_7 Con_{i,t} + a_8 Lnsize_{i,t} + \sum Year + \sum Ind + u_{i,t} \quad (3)$$

The results of the degree of surplus management as a mechanism analysis test are shown in Table 6. The regression coefficient of equity incentives (Ms) on the degree of accrual earnings management (DA) in column (1) is 0.021, which is significantly positive, indicating that equity incentives can facilitate the implementation of earnings management by firms. The regression results in column (2) show that after adding the mediating variable accrual earnings management (DA) to the baseline

regression, the regression coefficient of firm performance (EPS) and accrual earnings management (DA) is 2.438, which is significantly positive at 1% confidence level, indicating that the degree of accrual earnings management of the firm is positively related to firm performance, and the regression coefficient of firm performance (EPS) and equity incentives (Ms) The regression coefficient of company performance (EPS) and equity incentives (Ms) decreased from the baseline regression coefficient of 0.286 to 0.234, which was still significantly positive at 1% confidence level, indicating that earnings management plays a partially mediating role between equity incentives and firm performance, i.e. the implementation of equity incentives in a company can relate the interests of managers to the company and promote the implementation of earnings management, which in turn improves company performance, and hypothesis 2 was verified.

Table 6. Analysis of mechanisms

	(1)	(2)
	DA	EPS
Ms	0.021*	0.234***
	(1.85)	(3.93)
DA		2.438***
		(40.19)
Cash	-0.898***	3.390***
	(-64.09)	(35.43)
Grow	0.004***	0.023***
	(4.75)	(5.66)
Tat	0.026***	0.258***
	(6.10)	(10.21)
Debt	-0.179***	-0.709***
	(-22.74)	(-15.40)
Con	0.046***	0.450***
	(4.00)	(6.26)
Lnsize	0.024***	0.205***
	(12.26)	(15.17)
intercept distance	-0.379***	-4.239***
	(-7.74)	(-13.97)
Annual	Control	Control
Industries	Control	Control
Sample size	22,231	22,231
Adjustment of R^2	0.390	0.346

6. Heterogeneity Analysis

6.1 A Test Based on the Level of Management of the Company's Operations

Since the different firm managements may affect the effectiveness of the company's equity incentive, this study takes the practice of Cao Xiaowu and Xiong Tian (2021) into consideration, which defines firm management performance depends on net cash flow from operations, based on whether the net cash flow from production and operation activities is above zero. If so, the company has a satisfying management; if not, the management should be improved.

In Table 7, columns (1) to (2) show the regression results of equity incentives on firm performance under different levels of management. The regression coefficient of equity incentive (Ms) in column (1) is significantly positive at 1% confidence level, while the regression coefficient of equity incentive (Ms) in column (2) is positive but not significant. This is probably due to the fact that companies with negative net cash flow are in financial distress and are under increased pressure from investors, and therefore companies are more cautious when implementing equity incentives, and will reduce excessive equity incentives.

6.2 Tests based on Firm Finance Constraints

Referring to Hadlock and Piere (2010) and Leah Liu et al. (2015), this study used the formula$SA = -0.737 \times Size + 0.043 \times Size^2 - 0.04 \times Age$, where Size was the natural logarithm of firm size and Age was the firm's establishment time. The SA index is negative, and the larger the value taken indicates the higher the degree of financing constraint of the firm. This study further set the dummy variable SAD, and firms with SA higher than the median of the sample were defined as high financing constraint firms, i.e. SAD = 1, and firms with SA index lower than the median of the sample were defined as low financing constraint firms, i.e. SAD = 0. Also, the control variable firm size (Lnsize), which was the same variable as in the SA formula, was excluded from the regressions of this test in order to avoid endogeneity problems.

In Table 7, columns (3) (4) introduce the effect of firm financing constraints and test the regression results of hypothesis 3b. The coefficient on equity incentives (Ms) in the group test in columns (3) and (4) is significantly positive at the 1% level in the group of low financing constrained firms, while the coefficient on equity incentives (Ms) in the group of high financing constrained firms is positive insignificant and smaller than the coefficient in the group of low financing constrained firms, indicating that equity incentives are more significant in promoting the effectiveness of low financing constrained firms than high financing constrained firms. This stems from the fact that low financing constrained firms are less weak to equity incentives, and hypothesis 3b is tested.

Table 7. Heterogeneity test

	(1)	(2)	(3)	(4)
	High level of operational management	Low level of business management	High financing constraints	Low financing constraints
Ms	0.042	0.300***	0.207	0.365***
	(0.24)	(4.11)	(1.55)	(4.59)
Cash	1.533***	1.219***	1.002***	1.136***
	(11.33)	(13.31)	(9.26)	(9.66)
Grow	0.035***	0.028***	0.036***	0.035***
	(3.80)	(5.26)	(6.86)	(3.94)
Tat	0.280***	0.325***	0.292***	0.315***
	(5.26)	(9.61)	(6.35)	(6.57)
Debt	-1.526***	-0.991***	-0.967***	-0.910***
	(-15.25)	(-16.37)	(-11.85)	(-10.49)
Con	0.257	0.590***	0.696***	0.956***
	(1.63)	(6.60)	(5.72)	(7.08)
Lnsize	0.248***	0.259***		
	(8.28)	(16.16)		
Intercept distance	-4.460***	-5.158***	0.832***	0.170
	(-7.13)	(-13.27)	(-10.43)	(-11.19)
Annual	Control	Control	Control	Control
Industries	Control	Control	Control	Control
Sample size	8,078	14,153	12,168	10,063
Adjustment of R^2	0.188	0.178	0.112	0.142

7. Research Findings and Implications

This research empirically examines the impact of equity incentives on firm performance and the mediating effect of earnings management, and explores the differences in equity incentives across firms with different characteristics. The study finds that: firstly, equity incentives promote firm performance overall; secondly, based on the mediation effect test, it can be seen that there is a partial mediation effect of surplus management between equity incentives and firm performance, and firms

adopting equity incentives can promote earnings management and improve firm performance; thirdly, compared to firms with high management level and high financing constraints, equity incentives have a more significant effect on the performance of firms with low management level and low financing constraints. Thirdly, equity incentives have a more significant effect on the performance of companies with lower management levels and lower financing constraints than companies with higher management levels and higher financing constraints.

First, companies should implement equity incentives to promote corporate performance. With the separation of powers, it is easy for company executives to act in their own interests to the detriment of the company's interests. Therefore, the implementation of equity incentives to bundle the personal interests of executives with those of the company can alleviate the principal-agent problem, reduce agency costs and improve company performance.

Secondly, the company can implement surplus management appropriately. With the implementation of moderate surplus management, the manipulation of some accruals and the formation of benign surplus management can, to a certain extent, send a message to the outside world that the company is in good operating condition, which is conducive to enhancing investors' self-confidence, raising the share price and promoting the company's performance. It is also important to strengthen internal controls to avoid the occurrence of malignant surplus management and to reduce the disincentives caused by executives manipulating profits for their own benefit.

Finally, different equity incentive schemes should be adopted according to the level of management and financing constraints of the company. Considering that companies with different levels of management and financing constraints have different resources or problems. For companies with a high level of management and a low level of financing constraints, a higher level of equity incentive scheme should be chosen. On the contrary, for companies with low management level and high financing constraints, the promotion effect of equity incentive is not obvious and the equity incentive for company executives can be reduced.

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