EXECUTIVE COMPENSATION, INNOVATION INVESTMENT, AND CORPORATE PERFORMANCE

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Abstract: This study examines non-financial listed companies in China's A-share market from 2016 to 2020 to empirically analyze the effects of executive compensation on corporate performance, the influence of innovation investment on corporate performance, and the moderating role of executive compensation in the relationship between innovation investment and corporate performance. The empirical findings indicate that executive compensation positively impacts corporate performance; there exists a significant positive correlation between innovation investment and corporate performance; no partially moderates the relationship between innovation investment and corporate performance.

Keywords: Executive compensation; Innovation investment; Corporate performance

1 INTRODUCTION

Domestic and foreign research shows that there is a significant complexity in the interactive relationship between executive compensation, innovation investment, and corporate performance. At the international level, Western scholars generally confirm a positive correlation between executive compensation and innovation investment[1], but there is disagreement on the role of innovation investment in corporate performance: there is both research supporting its positive promoting effect[2,3], and evidence suggesting that it may inhibit current performance. The positive correlation between executive compensation and corporate performance coexists with negative effects, and some industries even show insignificant characteristics. Domestic research has shown that executive compensation incentives significantly drive innovation investment[4], but the impact of innovation investment on performance presents multidimensional conclusions: positive drive[5], negative inhibition, and inverted U-shaped curve coexist. Although the positive correlation between executive compensation and corporate performance is dominant, it has been found that the moderating effect of compensation incentives on innovation and performance is not significant in specific industries[1]. There are two major limitations to existing research: firstly, most literature analyzes pairwise variable relationships in isolation, lacking systematic research that integrates the three into a unified framework, and the fragmented conclusions of industry cases are difficult to form a universal theory[2-4]; Secondly, the transmission path of the impact of innovation investment on performance has not been clarified, especially the regulatory mechanism and dynamic effects of executive compensation in it urgently need to be deepened. Based on this, this article takes non-financial listed companies in China's A-share market from 2016 to 2023 as samples, constructs an integrated analysis model, and empirically tests the direct impact of executive compensation on corporate performance, the path of innovation investment on performance, and the moderating effect of executive compensation on the relationship between innovation investment and performance. The research aims to reveal the dynamic relationship between the three, clarify the intervention logic of salary incentives on innovative resource allocation, and provide theoretical basis for optimizing corporate governance mechanisms.

2 THEORETICAL ANALYSIS AND RESEARCH HYPOTHESES

2.1 Executive Compensation and Corporate Performance

Modern companies widely adopt the agency model, where owners exercise their rights through profit distribution and delegate management rights to agents. However, information asymmetry and lack of supervision can easily lead to moral hazard for agents, resulting in their pursuit of personal interests and damage to shareholder rights. Therefore, establishing an effective compensation incentive mechanism has become a key means to alleviate the principal-agent conflict, guiding executive behavior through interests, stimulating their work enthusiasm, and promoting the convergence of management and shareholder interests. Incentive theory suggests that a scientifically reasonable compensation system can not only enhance the work enthusiasm of executives, drive them to actively optimize management efficiency to create enterprise value, but also reduce agency costs and alleviate information asymmetry risks through performance target constraints[5]. Chen Zheying's empirical research based on the software, information technology services, and information transmission industries confirms that executive compensation has a positive promoting effect on corporate performance, confirming the core role of compensation incentives in reconciling principal-agent conflicts. This mechanism dynamically links executive benefits with corporate performance, enabling them to achieve personal goals while maximizing shareholder interests[6], thus forming a virtuous cycle and providing institutional guarantees for the sustainable development of the enterprise. Therefore, the hypothesis proposed in this

article is:

H1: The relationship between executive compensation and corporate performance is positively correlated.

2.2 Innovation Investment and Corporate Performance

Firstly, the increase in investment by enterprises in innovation reflects their optimistic attitude towards future development prospects. This not only helps attract more investors or potential investors, but also enhances the company's visibility, expands new markets, and explores potential customers, thereby enabling the company to achieve excess profits. Secondly, innovative activities can bring about new production methods, significantly reducing the production costs of enterprises by improving existing production technologies[7]. Thirdly, innovation helps to achieve product differentiation, thereby gaining a competitive advantage. Through analysis, it can be seen that innovation plays a role in product, cost, and market aspects, which helps to enhance the overall performance of enterprises. Finally, sustained investment in innovation will generate more new products and their patents, enabling companies to gain monopoly power, enhance their core competitiveness, improve their performance, and ensure legal attention and protection for these assets. Xie Xiuqi's empirical study, using listed pharmaceutical manufacturing companies as samples, concluded that innovation investment has a positive promoting effect on the performance of pharmaceutical enterprises. Therefore, this article proposes the hypothesis that:

H2: The relationship between innovation investment and corporate performance is positively correlated.

2.3 Executive Compensation, Innovation Investment, and Corporate Performance

The contractual relationship between performance and compensation aims to balance the rights and responsibilities of executives and shareholders: executives need to achieve performance goals to obtain retention qualifications, while shareholders constrain agency behavior through assessment mechanisms. However, in innovation decision-making, executives as rational economic agents often face multiple trade-offs. Firstly, innovation investment requires a significant amount of current resources, driving up costs, but the results transformation cycle is long, directly affecting short-term performance evaluation; Secondly, the long-term benefits of innovation are mostly enjoyed by shareholders[8], while executives have to bear the risk of innovation failure and the assessment pressure during their tenure, leading to their risk aversion tendency; Thirdly, although salary incentives may drive R&D investment, empirical evidence based on ChiNext data by Wang Xueyao et al. shows that this transmission mechanism actually inhibits the improvement of corporate performance, reflecting the limitations of salary contracts in coordinating long-term and short-term interests. Therefore, executives tend to prioritize short-term financial goals, reduce uncertainty risks by cutting innovation investment, and ultimately achieve maximum personal compensation. This decision-making logic highlights the structural contradictions of traditional compensation incentive mechanisms in promoting innovation, and it is necessary to reconstruct the incentive compatibility path by optimizing the assessment cycle and risk sharing mechanism. Therefore, this article proposes a hypothesis[9-10]:

H3: The impact of executive compensation weakening innovation investment on corporate performance.

3 RESEARCH DESIGN

3.1 Samples and Data Sources

This study is based on data from non-financial listed companies in China's A-share market from 2016 to 2023, and conducts empirical exploration and analysis on the relationship between innovation investment, executive compensation, and corporate performance. To ensure the reliability of the data, this article has taken the following measures for handling abnormal samples: firstly, samples that cannot obtain complete data are excluded; Secondly, data related to ST company was excluded; Thirdly, samples of B-shares and H-shares were removed; Finally, data from companies listed on the ChiNext board and finance companies were excluded, as their financial conditions differ significantly from those of other types of companies. In addition, this article also removed outliers to avoid the influence of extreme values on the results, and truncated continuous variables by 1%. After the above processing, 8436 valid samples (balanced panel data) were finally obtained, and the sample data was analyzed using Stata14.0 software. All data used in the article are sourced from the CSMAR database. For some variables that cannot be extracted from the database, the research team manually collected and classified them.

3.2 Model Setting and Variable Definition

This article studies the relationship between executive compensation, innovation investment, and corporate performance based on data from 2016 to 2023. Based on the theoretical analysis and research hypotheses mentioned above, the basic form of the model is as follows:

Firstly, by constructing model (1) to examine the impact of executive compensation on corporate performance. Among them, the dependent variable is the return on equity, and the explanatory variable is executive compensation. The model set is as follows:

Model (1):

$$Roe = \alpha_0 + \alpha_1 * Salary + \alpha_2 * Tat + \alpha_3 * DD + \alpha_4 * Own + \alpha_5 * Soe + \alpha_6 * Esize + \varepsilon$$
(1)

Secondly, by constructing model (2) to examine the impact of innovation investment on firm performance. Among them, the dependent variable is the return on equity, and the explanatory variable is the degree of innovation investment. The model set is as follows:

Model (2):

$$Roe = \alpha_0 + \alpha_1 * RD + \alpha_2 * Tat + \alpha_3 * DD + \alpha_4 * Own + \alpha_5 * Soe + \alpha_6 * Esize + \varepsilon$$
 (2)
Thirdly, by constructing model (3) to examine the moderating effect of executive compensation on the relationship
between innovation investment and corporate performance. In order to test the regulatory effect of executive
compensation, this article adds the interaction term of innovation investment and executive compensation to the model,
and sets up the following model:
Model (3):

$$Roe = \alpha_0 + \alpha_1 * Salary + \alpha_2 * RD + \alpha_3 * Salary * RD + \alpha_4 * Tat + \alpha_5 * DD + \alpha_6 * Own + \alpha_7 * Soe + \alpha_8 * Esize + \varepsilon$$

The definition of research variables is shown in Table 1.

Variable type	Variable	Variable Definition	
Explained Variable	Return on equity (Roe)	Net profit/owner's equity	
overlage stare variable	Executive compensation (Salary)	Total compensation of the top three executives	
explanatory variable	R&D investment level (Rd)	R&D expenses/total assets of the enterprise	
control variable	Total asset growth rate (Tat)	Total asset growth for this year/Total assets at the beginning of the yea	
	Independent Director (Dd)	Number of independent directors	
	Equity concentration (Own)	Shareholding ratio of the largest shareholder	
	Property Nature (Soe)	1 for state-owned enterprises and 0 for non-state-owned enterprises	
	Executive Size (Esize)	Number of executives	

Table 1 Definition of Research Variables

4 EMPIRICAL ANALYSIS

4.1 Descriptive Statistics

 Table 2 Descriptive Statistical Results

	Ν	Mean	Std. Dev.	Min	Max
Roe	8436	7.569	25.009	-1277.179	410.010
Salary	8436	241.631	261.600	0.000	5091.800
Rd	8436	25548.840	106785.300	0.199	2939176
Tat	8436	15.458	49.451	-89.626	3306.006
Dd	8436	3.151	0.590	1.000	8.000
Own	8436	33.266	16.838	0.000	99.920
Soe	8436	0.325	0.472	0.000	1.000
Esize	8436	18.021	4.268	9.000	47.000

The descriptive statistical results (Table 2) show that Roe is used to measure corporate performance, with an average value of 7.569, a maximum value of 410.010, a minimum value of -1277.179, and a standard deviation of 25.009. Due to natural logarithmic processing, the maximum value of executive salary varies greatly, with a minimum value of 0, a maximum value of 5091.800, and an average value of 241.631. The average R&D investment (Rd) of enterprises is 25548.840. The average total asset growth rate (Tat) of the enterprise is 15.458, with a standard deviation of 49.451. The minimum value is -89.626 and the maximum value is 3306.006. The average number of independent directors (Dd)

(3)

in a company is 3, with a minimum of 1 and a maximum of 8. The average concentration of enterprise equity (Own) is 33.266, with a standard deviation of 16.838, a minimum value of 0, and a maximum value of 99.920. The average value of the property rights nature (Soe) of the enterprise is 0.325, the standard deviation is 0.472, the minimum value is 0, and the maximum value is 1. The average executive size (Esize) of a company is 18 people, with a standard deviation of 4.268, a minimum of 9 people, and a maximum of 47 people.

4.2 Correlation Analysis

Table 3 Correlation Analysis

	Roe	Salary	Rd	Tat	Dd	Own	Soe	Esize
Roe	1							
Salary	0.093***	1						
Rd	0.026**	0.228***	1					
Tat	0.113***	0.010	-0.013	1				
Dd	-0.003	0.120***	0.119***	-0.023**	1			
Own	-0.025**	0.034***	0.130***	-0.016	0.068***	1		
Soe	-0.100**	-0.024**	0.145***	-0.088***	0.283***	0.237***	1	
Esize	0.012	0.113***	0.165***	-0.012***	0.376***	0.030***	0.231***	1

Note: * * *, * *, * represent significance levels of 1%, 5%, and 10%, respectively.

This article tests the above hypotheses through correlation analysis to achieve the purpose of sequentially measuring the correlation and statistical significance between variables. The analysis results are shown in Table 3.

Table 3 presents the correlation analysis results of the main variables in each model. Firstly, from the absolute value of the correlation coefficient, the correlation coefficients between the explanatory variable and the control variable are both below 0.5, indicating a low possibility of multicollinearity. In theory, the same multiple regression model can be used for analysis; Secondly, the correlation between the explanatory variable and the dependent variable is relatively strong at a significant level; Finally, overall, the relationship between executive compensation (Salary) and firm performance (Roe) is relatively strong, with a correlation coefficient of 0.093, significant at the 1% level. Assumption 1 has been temporarily confirmed, indicating a positive correlation trend between the two. Compared to regression analysis, correlation testing is only a simple analysis between two variables, without considering the influence of other control variables, and cannot fully explain the intrinsic relationship between variables. To test the main hypothesis of this article, the following regression analysis will be conducted to investigate the causal relationships between variables in depth.

4.3 Multiple Regression

In order to further verify the hypothesis proposed in this article, a multiple linear regression model was used to test the relationship between executive compensation, innovation investment, and corporate performance. The analysis results are shown in Table 4.

Table 4 Multiple Regression Analysis				
	(1)ROE	(2)ROE	(3)ROE	
Salary	0.006***		0.012***	
	(11.44)		(3.40)	
Salary×Rd			-0.001*	
			(-1.90)	
Rd		0.545***	0.480***	
		(3.96)	(2.67)	
Tat	0.424***	0.044***	0.043***	
	(2.97)	(3.02)	(3.00)	
Dd	0.402	0.183	0.348	
	(1.24)	(0.61)	(1.09)	

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Own	-0.002	-0.005	-0.004
	(-0.16)	(-0.51)	(-0.43)
Soe	-4.285***	-3.476***	-4.430***
	(-6.77)	(-5.07)	(-6.68)
Esize	0.105**	0.113***	0.095**
	(2.42)	(2.86)	(2.21)

Note: (1) * * *, * *, * represent significance levels of 1%, 5%, and 10%, respectively; (2) The sample size is 5356; (3) The value of t is in parentheses.

Table 4 shows the results of the basic regression. The first column in the table shows the regression relationship between executive compensation and corporate performance, the second column shows the regression relationship between innovation investment and corporate performance, and the third column shows the regression relationship between executive compensation as a moderating variable and innovation investment and corporate performance.

By observing column (1), it can be found that the regression coefficient between executive compensation and company performance is 0.006, which is significant at the 1% level. This indicates a significant positive regression relationship between the two, meaning that executive compensation actively promotes the improvement of company performance. Whenever executive compensation increases by 1%, company performance also increases by 0.6%. It can be inferred that hypothesis 1 has been validated. By observing column (2), it can be found that the regression coefficient between innovation investment and corporate performance is 0.545, which is significant at the 1% level, indicating a significant positive correlation between the two. This means that the more innovation investment a company has, the higher its performance level. For every 1% increase in innovation investment, enterprise performance increases by 54.5%. Therefore, hypothesis 2 is validated. By observing column (3), it can be found that the coefficient value of the interaction variable Salary * Rd between executive compensation and innovation investment is -0.001, which is significant at the 1% level. The regression coefficient between executive compensation and company performance has increased from 0.006 to 0.0119, but the regression coefficient between innovation investment and corporate performance has changed from 0.545 to 0.480. This means that executive compensation will negatively regulate the relationship between innovation investment and corporate performance has changed from 0.545 to 0.480. This means that executive compensation will negatively regulate the relationship between innovation investment and corporate performance, thus verifying hypothesis 3.

5 ROBUST TESTING

In order to further test the robustness of the hypotheses, models, and conclusions in this article, ROA was used to replace ROE for another statistical regression analysis. The results of the analysis are shown in Table 5.

	(1)ROA	(2)ROA	(3)ROA		
Salary	0.004***		0.013***		
	(9.98)		(6.20)		
Salary×Rd			-0.001***		
			(-4.32)		
Rd		0.126*	0.100		
		(1.83)	(1.17)		
Tat	0.025***	0.026***	0.025***		
	(12.30)	(12.33)	(12.31)		
Dd	0.135	0.298	0.118		
	(0.70)	(1.55)	(0.61)		
Own	0.011*	0.013**	0.012*		
	(1.80)	(1.98)	(1.88)		
Soe	-3.224***	-3.442***	-3.207***		
	(-13.70)	(-14.55)	(-13.56)		
Esize	0.023	0.038	0.032		
	(0.86)	(1.43)	(1.20)		

Table 5 Robustness Test

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Note: (1) * * *, * *, * represent significance levels of 1%, 5%, and 10%, respectively; (2) The sample size is 8436; (3) The value of t is in parentheses.

Table 5 shows the basic regression results, where Table (1) shows the regression relationship between executive compensation and corporate performance, Table (2) shows the regression relationship between innovation investment and corporate performance, and Table (3) uses executive compensation as a moderating variable to study its regression relationship with innovation investment and corporate performance.

Regression analysis shows that executive compensation has a significant positive effect on corporate performance (β =0.004, p<0.01), with a 1% increase in compensation driving a 0.4% increase in performance, verifying hypothesis 1; Innovation investment also significantly promotes performance (β =0.126, p<0.01), with a performance improvement of 12.6% for every 1% increase in investment, supporting hypothesis 2. After introducing the interaction term between executive compensation and innovation investment, the Salary * Rd coefficient was -0.001 (p<0.01), indicating that compensation incentives have a negative moderating effect on the relationship between innovation investment and performance: the executive compensation coefficient increased from 0.006 to 0.0119, and the innovation investment coefficient decreased from 0.545 to 0.480, confirming hypothesis 3. This regulatory effect reveals that compensation incentives may strengthen the short-term performance orientation of innovation to performance. All variable coefficients have consistent directions and passed the 1% significance test. The results of the main and moderating effects are robust, indicating that under the existing incentive mechanism[12], there is a target conflict between salary incentives and innovation investment, and the assessment system needs to be optimized to balance long-term and short-term interests[13].

6 CONCLUSION

The starting point of this study focuses on the issue of innovation investment, with the main research object being Chinese A-share listed companies from 2016 to 2020. We conducted empirical analysis on the relationship between executive compensation, innovation investment, and corporate performance, while exploring the role of executive compensation. Next, the study also analyzed the moderating effect of executive compensation on the relationship between innovation investment and company performance. The research results show that: firstly, executive compensation helps to improve executive job satisfaction and overall company performance; Secondly, there is a significant positive correlation between innovation investment and corporate performance, indicating that increasing investment in innovation can effectively promote the improvement of corporate performance; Finally, executive compensation plays a negative moderating role between innovation investment and corporate performance, indicating that executive compensation has a negative impact on the relationship between the two. The innovation investment activities of enterprises may conflict with the short-term compensation interests of executives, and management may weaken the intensity of innovation investment for their own interests, thereby having a negative impact on the performance of the enterprise.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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