

IMPACT OF EXECUTIVE COMPENSATION INCENTIVES ON CORPORATE INNOVATION PERFORMANCE: ANALYSIS OF THE MEDIATING EFFECT BASED ON R&D INVESTMENT

Min Wan^{a, b*}, S. M. Ferdous Azam^b

^a*School of Accounting, Nanjing University of Finance & Economics Hongshan College, Nanjing, 210000, China;* ^b*Graduate School of Management, Postgraduate Centre, Management and Science University, Shah Alam, Selangor, 40100, Malaysia.*

*Corresponding author: Min Wan, min19900103@163.com

Funding Statement

This work was supported by the 2024 General Project of Philosophy and Social Science Research in Jiangsu Colleges and Universities: Research on the Influence Mechanism and Results of Government Subsidies on Enterprise Innovation Performance in the Context of Digital Economy (Project No. 2024SJYB1636).

Abstract: Innovation-driven development relies on enterprises as the primary agents of innovation, with talent being the cornerstone of corporate innovation. As the principal custodians of innovation within enterprises, executive incentives are regarded as a crucial mechanism for resolving principal-agent conflicts and enhancing corporate innovation performance. This study examines the impact of executive compensation incentives on corporate innovation performance and its underlying mechanisms, using Chinese A-share listed companies from 2014 to 2023 as the research sample. Findings reveal that executive compensation incentives exert a significant positive influence on substantive innovation performance, strategic innovation performance, and overall innovation performance, with the most pronounced effect observed on strategic innovation. Executive compensation incentives can increase corporate output in substantive and strategic innovation by promoting greater investment in R&D personnel and capital. R&D investment partially mediates the relationship between executive compensation incentives and corporate innovation performance. Heterogeneity analysis reveals that executive compensation incentives exert a stronger influence on innovation performance in enterprises located in eastern and central regions, as well as in non-state-owned enterprises. Consequently, companies should implement targeted executive incentive schemes tailored to their regional characteristics, ownership structure, and specific developmental requirements.

Keywords: executive compensation incentives, substantive innovation performance, strategic innovation performance, research and development investment

1. Introduction

Innovation is the primary driving force for development and a strategic pillar for building a modernized economic system. Enterprises are the main agents of innovation activities, and engaging in such activities is a vital means for them to enhance their core competitiveness and economic efficiency. Senior executives serve as both the formulators and implementers of

corporate strategy, with their decisions directly influencing an organization's innovation performance (Yi & Wang, 2025). However, the high-risk nature and extended timeframes inherent in innovation activities subject executives to considerable pressure during the innovation decision-making process. Executive incentive schemes, serving as a crucial mechanism for mitigating conflicts of interest between executives and shareholders, must be appropriately designed and refined to effectively harness executives' role in driving corporate innovation (Wu & Huang, 2024).

Executive remuneration constitutes an explicit form of incentive for senior management and serves as a short-term motivational tool. It primarily encompasses basic salary, performance-related pay, year-end bonuses, and various monetary benefits and allowances (Zhao, 2024). Compensation incentives can compensate for the short-term revenue losses incurred by executives due to technological innovation investments, thereby mitigating their tendency towards short-termism to a certain extent (Lv, 2023; Zhou & Li, 2025). Executives constitute the core driving force behind corporate innovation investment, with their motivation directly influencing corporate investment decisions and consequently shaping the intensity of innovation. Therefore, establishing a rational executive remuneration incentive mechanism to stimulate their innovative intent holds significant importance for enhancing corporate innovation performance.

This study endeavours to contribute to the existing literature in the following respects: Firstly, it isolates executive compensation incentives from broader executive motivation frameworks to examine their specific impact on corporate innovation performance. Existing research has predominantly centred on the impact of executive incentives on corporate innovation, examining both equity-based and remuneration-based incentives. Secondly, adopting a perspective of innovation performance heterogeneity, corporate innovation performance has been categorised into substantive innovation performance, strategic innovation performance, and overall innovation performance. This approach explores the effects of executive compensation incentives on different dimensions of corporate innovation performance and analyses the variations in these impacts. Thirdly, this study examines the mechanism through which executive compensation incentives influence innovation performance, specifically exploring the mediating role of research and development (R&D) investment. Existing research predominantly focuses on R&D investment as a mediator between executive equity incentives and corporate innovation, with limited investigation into its role in the relationship between executive compensation incentives and corporate innovation performance. Consequently, measuring R&D investment from both financial investment and human resource investment perspectives enriches the research framework for examining R&D investment. Fourthly, by focusing the research scope on the entire sector of A-share listed companies rather than restricting it to specific industries such as manufacturing, high-tech sectors, pharmaceutical manufacturers, or heavily polluting enterprises, the conclusions attain broader applicability. These novel research perspectives address existing shortcomings in current studies and provide a theoretical foundation for enterprises to formulate targeted executive compensation incentive schemes.

2. Theoretical Analysis and Research Hypotheses

2.1 Executive Compensation Incentives and Corporate Innovation Performance

Innovation serves as a vital pathway for enterprises to enhance their core competitiveness and economic efficiency. Given that the actual control of enterprises lies with senior executives, the sustained implementation of corporate innovation strategies hinges upon sound decision-making by these executives (Ren, Feng & Zhen, 2022). According to agency theory and optimal contract theory, the separation of ownership and management creates information asymmetry between the company's day-to-day operators and its shareholder-owners. To resolve conflicts of interest between managers and shareholders and incentivize managers to act in shareholders' interests, enterprises typically design executive compensation incentive schemes (Peng & Xie, 2023; Wang & Wang, 2025). Reasonable remuneration incentives not only narrow the gap between executives' and shareholders' interests but also guide executives to focus on the company's long-term development, reducing short-term profit-seeking behaviour. This, in turn, enhances the company's long-term investment and innovation drive (Lv, 2023; Du, Sun & Deng, 2021). Executive remuneration schemes, as corporate incentives for managers, exert a certain degree of influence over the rational allocation of corporate resources and the long-term development of the enterprise (Chang & Han, 2024). This remuneration structure, closely tied to individual performance, reduces the inclination of executives to exploit innovative projects for personal gain. Instead, it incentivizes research-oriented executives to increase investment in technological R&D and enhance their innovation capabilities. Ultimately, this incentive mechanism helps strengthen the enterprise's core competitiveness, propelling it towards greater market advantage (Zhao, 2024). Monetary compensation incentives for senior executives significantly promote corporate innovation activities (Weng & Ma, 2022), foster technological innovation (Zhou & Liu, 2025), enhance the efficiency of corporate resource allocation (Yin et al., 2021), positively influence the quality of corporate innovation (Zhang et al., 2022), and boost innovation performance (Yi & Wang, 2025; Yi & Cai, 2023; Dong & Qin, 2023).

Li & Zheng (2016), Qu, Wang & Zhang (2022) and others categorize corporate innovation activities into substantive innovation and strategic innovation from a motivational perspective. Substantive innovation, measured by the number of invention patents applied for by enterprises, constitutes high-quality innovation activities that propel corporate development. Conversely, strategic innovation, gauged by the volume of utility model and design patents sought, represents a key manifestation of firms' pursuit of innovation in terms of both quantity and speed (Qin & Huang, 2020). Lu (2025) found that executive remuneration can effectively enhance a company's breakthrough innovation output. Given the differences between substantive innovation and strategic innovation in terms of R&D complexity, capital investment scale, and project duration, executive compensation incentives inevitably exert distinct effects on these two innovation types. However, whether pursuing high-quality substantive innovation or high-speed, high-volume strategic innovation, both are enhanced under executive compensation incentives.

Based on this, the following hypotheses are proposed in this study.

H1: Executive compensation incentives can enhance corporate innovation performance.

2.2 The Function of Research and Development Investment as a Mediator

Executive compensation incentives can compensate for personal losses incurred by senior managers due to investment missteps, thereby encouraging greater investment in research and development and innovation projects with high long-term returns (Zhou & Li, 2025). Miao(2018) used data from listed pharmaceutical manufacturing companies as her sample, discovered an inverted U-shaped non-linear relationship between executive remuneration and research and development expenditure. Specifically, as executive remuneration levels increase, R&D investment initially rises before subsequently declining. Executive incentives only exert a significant promotional effect on corporate R&D investment within a certain reasonable range; both excessively high and excessively low levels of incentive fail to effectively boost corporate R&D investment. Wang (2011) used listed manufacturing companies as a sample, found that higher short-term executive remuneration correlates with greater R&D investment, and that short-term pay incentives exert a stronger positive effect on low-growth and low-profitability firms. Liu, Huang & Xu (2024) employed fuzzy set qualitative comparative analysis to examine high-tech enterprises listed on the ChiNext board. Their findings revealed six distinct pathways through which government support and executive incentives can drive high R&D investment among such enterprises. Li & Shen (2023) used GEM-listed companies as their sample, found that implementing management incentives can enhance corporate R&D investment levels, with this effect being more pronounced in private enterprises.

The greater the incentive provided through remuneration, the stronger the willingness of senior executives to engage in innovation, with corresponding increases in both the firm's innovation investment and innovation output (Zhang, Li & Wang, 2024). Liu, Yang & Zhao (2024) conducted research on high-tech enterprises listed on the ChiNext board, selecting 339 sample companies according to relevant criteria. The study found that R&D investment exerts a "full mediating effect" across equity checks and balances, board size, executive compensation, and innovation performance. Enhancing executive remuneration and benefits alters management's pursuit of corporate objectives, directing greater emphasis towards technological innovation. This encourages proactive implementation of the board's innovation decisions, increases R&D investment, and consequently elevates the enterprise's innovation performance.

Based on this, the following hypothesis is proposed.

H2: Executive compensation incentives can promote increased corporate investment in research and development.

H3: Executive compensation incentives can drive improvements in corporate innovation performance by encouraging increased research and development expenditure, with R&D investment serving as an intermediary between the two.

3. Research Design

3.1 Data Sources

This study employs panel data from Chinese A-share listed companies spanning 2014 to 2023 for empirical analysis, subjecting the data to pre-processing as follows: Firstly, exclusion of financial sector enterprises and those with abnormal statuses, including ST and *ST companies; secondly, removal of samples with missing key indicators such as innovation performance, R&D personnel, and R&D investment; Thirdly, to mitigate potential interference from outliers, continuous variables underwent Winsorisation at the upper and lower 1% levels. This process yielded a final dataset comprising 16,583 observations. Company fundamentals, financial statement data, and control variables were sourced from the Guotai An CSMAR Research Database. R&D personnel and expenditure data originated from the RESSET Financial Research Database, while patent data was obtained from the China National Research Data Service (CNRDS).

3.2 Variable Selection

3.2.1 Dependent Variable

This study employs innovation performance as the dependent variable, with corporate innovation output serving as the metric for innovation performance. The number of patents applied for by an enterprise constitutes a key indicator of its innovation output. Patent applications fall into three categories: invention patents, utility model patents, and design patents. Drawing upon the work of Ma Shi (2023), Qu Xiaohui, Wang Jun, and Zhang Ruili (2022), among others, corporate innovation performance is further categorized into substantive innovation and strategic innovation. Substantive innovation is measured by the number of invention patents, while strategic innovation is assessed through utility model and design patents—that is, non-invention patents. Overall innovation performance is evaluated by the sum of all three patent types.

3.2.2 Independent Variable

The independent variable in this study is executive compensation incentives, referring to the basic salary, performance-related pay, year-end bonuses, and various monetary benefits and allowances provided by enterprises to senior executives. It specifically denotes monetary remuneration received by executives, measured by the natural logarithm of the total compensation amount for senior management personnel.

3.2.3 Mediating Variables

This study selects R&D investment as the mediating variable, which comprises two components: R&D personnel investment and R&D capital investment. R&D personnel investment is measured by the proportion of R&D staff relative to the company's total workforce, while R&D capital investment is assessed by the ratio of R&D investment to operating revenue.

3.2.4 Control Variables

This study draws upon existing research to select control variables that exhibit a certain degree of correlation with innovation performance, specifically focusing on characteristic scalars of corporate finance and equity structure. The control variables encompass firm size, debt-to-equity ratio, revenue growth rate, equity concentration, return on assets, board size, proportion of independent directors, and the dual role of chairman and chief executive officer. Table 1 provides definitions for the principal variables.

Table 1. Main variables and definitions.

| Variable type | Variable name | Variable abbreviation | Description of variables |
|----------------------|-------------------------------------|-----------------------|---|
| Dependent variable | Substantive innovation performance | RIP | LN(Number of inventions filed in the year +1) |
| | Strategic Innovation Performance | SIP | LN(Total non-invention patents filed in the year +1) |
| | Total innovation performance | TIP | LN(Total number of patents filed during the year +1) |
| Independent variable | Executive compensation incentives | ECIG | ln(Total remuneration of senior management) |
| Control variables | Enterprise size | SIZE | LN (total assets) |
| | Asset-liability ratio | LEV | Total liabilities/total assets |
| | Operating income growth rate | GROWTH | (Amount of operating income for the current year - Amount of operating income for the same period of the previous year) / (Amount of operating income for the same period of the previous year) |
| | equity concentration | OWNER | Shareholding ratio of the largest shareholder |
| | Net profit margin of total assets | ROA | Net profit/total assets |
| | Board size | DIR | LN (Number of Board of Directors) |
| | Proportion of independent directors | INDIR | Number of independent directors/total number of board members |

| | | | |
|--------------------|---|-------|---|
| | Chairman of the Board of Directors and General Manager at the same time | DUALE | Same person is 1; not same person is 0 |
| Mediating variable | R&D personnel investment | RDP | Number of R&D staff/total number of employees |
| | R&D capital investment | RDI | R&D capital investment/revenue |

3.3 Model Setting

The data employed in this study constitutes panel data, necessitating the application of the F-test and Hausman test to validate the final model. The test results are presented in Table 2:

Table 2. Results of the F-test and Hausman test

| Dependent variable | F-test | | Hausman-test | |
|--------------------|---------|-----------------|------------------|--------------------------------|
| | F-value | P-value | Chi ² | P-value |
| RIP | 253.648 | Prob > F =0.000 | 60.786 | Prob > Chi ² =0.000 |
| SIP | 130.208 | Prob > F= 0.000 | 45.128 | Prob > Chi ² =0.000 |
| TIP | 235.550 | Prob > F =0.000 | 39.315 | Prob > Chi ² =0.000 |

First, an F-test was conducted to determine whether the OLS or fixed-effects model better fits the selected sample data. The results indicate that the independent variable 'executive compensation incentives' is statistically significant at the 1% level. This suggests that the fixed-effects model provides a more accurate representation of the issue compared to the mixed regression model. Subsequently, a Hausman test was conducted to examine whether the random effects model outperforms the fixed effects model, specifically whether the coefficients obtained from the two approaches exhibit significant differences. As shown in the table, the P-values for both tests were 0.000, below 0.01. Therefore, the null hypothesis is rejected at the 1% significance level, indicating that the fixed effects model better fits the sample data selected for this section.

To test Hypothesis 1, the following fixed-effects model was constructed for empirical analysis.

$$EIP_{i,t} (RIP_{i,t} / SIP_{i,t} / TIP_{i,t}) = \beta_0 + \beta_1 ECIG_{i,t} + \beta_2 \Sigma Controls_{i,t} + \Sigma Year + \Sigma ID + \epsilon_{i,t} \quad (1)$$

Here, i and t denote the company and year respectively, with EIP_{i,t} representing the innovation performance of listed company i during period t. Specifically, RIP_{i,t} denotes the logarithm of the number of invention patent applications plus one for listed company i during

period t ; $SIP_{i,t}$ denotes the logarithm of the sum of utility model and design patent applications plus one for listed company i during period t ; $TIP_{i,t}$ denotes the logarithm of the total number of patent applications plus one for listed company i during period t . $ECIG_{i,t}$ denotes the executive compensation incentives for listed company i during period t . $Controls_{i,t}$ represents the control variable matrix for the economic characteristics of listed companies, encompassing firm size, debt-to-equity ratio, operating revenue growth rate, equity concentration, return on total assets, board size, proportion of independent directors, and whether the chairman and chief executive officer positions are held concurrently. $\Sigma Year$ and ΣID denote the year-level control variable and the individual-level control variable respectively, $\epsilon_{i,t}$ is the residual term. When the regression coefficient β_1 for $ECIG_{i,t}$ in Model (1) is greater than zero and statistically significant, this indicates that executive compensation incentives exert a significant positive influence on corporate innovation performance, thereby confirming the validity of Hypothesis 1.

To verify the mediating effect of R&D investment on executive compensation incentives and corporate innovation performance, this study adopts the research methodology of Wen Zhonglin et al. (2004). A regression model is constructed to test the following mediating effect.

$$RD_{i,t} (RDI_{i,t} / RDP_{i,t}) = \beta_0 + \beta_1 ECIG_{i,t} + \beta_2 \Sigma Controls_{i,t} + \Sigma Year + \Sigma ID + \epsilon_{i,t} \quad (2)$$

$$EIP_{i,t} (RIP_{i,t} / SIP_{i,t} / TIP_{i,t}) = \beta_0 + \beta_1 RD_{i,t} (RDI_{i,t} / RDP_{i,t}) + \beta_2 \Sigma Controls_{i,t} + \Sigma Year + \Sigma ID + \epsilon_{i,t} \quad (3)$$

$$EIP_{i,t} (RIP_{i,t} / SIP_{i,t} / TIP_{i,t}) = \beta_0 + \beta_1 ECIG_{i,t} + \beta_1 RD_{i,t} (RDI_{i,t} / RDP_{i,t}) + \beta_3 \Sigma Controls_{i,t} + \Sigma Year + \Sigma ID + \epsilon_{i,t} \quad (4)$$

When the regression coefficient β_1 for $ECIG_{i,t}$ in Model (2) is greater than zero and statistically significant, the regression coefficient β_1 for $RD_{i,t}$ in Model (3) is greater than zero and statistically significant, and the regression coefficient β_1 for $ECIG_{i,t}$ in Model (4) is greater than zero and statistically significant, this indicates that R&D expenditure exerts a mediating effect, albeit only partially. The impact of executive compensation incentives on corporate innovation performance is only partially mediated through the intermediary variable of R&D expenditure.

4. Empirical Findings and Analysis

4.1 Descriptive Statistics

Table 3 presents the descriptive statistics for each variable. It is evident that, as this study focuses on A-share listed companies, the large sample size and varying company scales result in significant variance in firm size, indicating substantial differences in scale between enterprises. For the variables of substantive innovation and strategic innovation, cases with zero patent counts were excluded. Examining the maximum, minimum, and variance values reveals comparable patterns between the two variables. However, the median for strategic innovation is higher, indicating that

companies generally demonstrate superior strategic innovation compared to substantive innovation.

Table 3. Descriptive Statistics

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|----------|-------|--------|-----------|--------|--------|
| ECIG | 16583 | 15.185 | .764 | 13.469 | 17.294 |
| RDI | 16583 | .05 | .045 | .001 | .266 |
| RDP | 16583 | .16 | .12 | .005 | .637 |
| RIP | 16583 | 2.954 | 1.359 | .693 | 7.107 |
| SIP | 16583 | 3.251 | 1.321 | .693 | 6.854 |
| TIP | 16583 | 3.896 | 1.268 | 1.386 | 7.732 |
| SIZE | 16583 | 22.581 | 1.309 | 20.211 | 26.525 |
| LEV | 16583 | .43 | .188 | .073 | .87 |
| GROWTH | 16583 | .148 | .326 | -.463 | 1.833 |
| OWNER | 16583 | .323 | .143 | .08 | .721 |
| ROA | 16583 | .034 | .062 | -.243 | .192 |
| DIR | 16525 | 2.266 | .275 | 1.609 | 2.944 |
| INDIR | 16583 | .38 | .099 | 0 | .625 |
| DUALE | 16583 | .271 | .445 | 0 | 1 |

4.2 Correlation Analysis

Table 4. Pairwise Correlations

| Variables | ECIG | SIZE | LEV | GR | OW | ROA | DIR | INDIR | DUALE | RIP | SIP | TIP |
|-----------|--------|--------|--------|------|------|------|-----|-------|-------|-----|-----|-----|
| ECIG | 1.0 | | | | | | | | | | | |
| SIZE | 0.502* | 1.0 | | | | | | | | | | |
| LEV | 0.157* | 0.500* | 1.0 | | | | | | | | | |
| GR | 0.0 | 0.0 | 0.0 | 1.00 | | | | | | | | |
| OW | 0.19* | 0.28* | 0.28* | 0 | 1.0 | | | | | | | |
| ROA | 0.0 | 0.23* | 0.71* | 0.05 | 0.00 | 1.0 | | | | | | |
| DIR | 0.13* | 0.02** | 0.02** | 0.00 | 0.00 | 0.00 | 1.0 | | | | | |
| INDIR | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | | | | |
| DUALE | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | | | |
| RIP | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | | |
| SIP | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | |
| TIP | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| RO | 0.1 | 0.0 | - | 0.26 | 0.1 | 1.0 | | | | | | | | |
| A | 77* | 52* | 0.3 | 2** | 53* | 00 | | | | | | | | |
| | ** | ** | 37* | * | ** | | | | | | | | | |
| | | | ** | | | | | | | | | | | |
| DIR | 0.1 | 0.2 | 0.1 | - | 0.0 | - | 1.0 | | | | | | | |
| | 48* | 53* | 73* | 0.01 | 03 | 0.0 | 00 | | | | | | | |
| | ** | ** | ** | 6** | | 65* | | | | | | | | |
| | | | | | | ** | | | | | | | | |
| IND | - | - | - | - | 0.0 | 0.0 | - | 1.0 | | | | | | |
| IR | 0.0 | 0.0 | 0.0 | 0.02 | 14* | 37* | 0.0 | 00 | | | | | | |
| | 15* | 21* | 29* | 9** | | ** | 49* | | | | | | | |
| | | ** | ** | * | | | ** | | | | | | | |
| DU | - | - | - | 0.02 | - | 0.0 | - | 0.0 | 1.0 | | | | | |
| ALE | 0.0 | 0.1 | 0.1 | 8** | 0.0 | 15* | 0.1 | 22* | 00 | | | | | |
| | 20* | 54* | 08* | * | 69* | | 17* | ** | | | | | | |
| | ** | ** | ** | | ** | | ** | | | | | | | |
| RDI | 0.0 | - | - | - | - | - | - | 0.0 | 0.1 | 1.0 | | | | |
| | 49* | 0.2 | 0.2 | 0.06 | 0.1 | 0.0 | 0.0 | 26* | 23* | 00 | | | | |
| | ** | 53* | 86* | 9** | 94* | 88* | 93* | ** | ** | | | | | |
| | | ** | ** | * | ** | ** | ** | | | | | | | |
| RDP | 0.0 | - | - | 0.01 | - | - | - | 0.0 | 0.0 | 0.6 | 1.0 | | | |
| | 08 | 0.2 | 0.1 | 2 | 0.1 | 0.0 | 0.1 | 14* | 98* | 52* | 00 | | | |
| | | 22* | 98* | | 75* | 31* | 00* | | ** | ** | | | | |
| | | ** | ** | | ** | ** | ** | | | | | | | |
| RIP | 0.3 | 0.5 | 0.2 | 0.03 | 0.0 | 0.0 | 0.1 | 0.0 | - | 0.1 | 0.1 | 1.0 | | |
| | 82* | 43* | 46* | 0** | 79* | 56* | 24* | 02 | 0.0 | 60* | 59* | 00 | | |
| | ** | ** | ** | * | ** | ** | ** | | 56* | ** | ** | | | |
| | | | | | | | | | ** | | | | | |
| SIP | 0.2 | 0.4 | 0.2 | 0.03 | 0.1 | 0.0 | 0.1 | 0.0 | - | - | - | 0.6 | 1.0 | |
| | 83* | 92* | 98* | 8** | 18* | 52* | 00* | 04 | 0.0 | 0.0 | 0.0 | 82* | 00 | |
| | ** | ** | ** | * | ** | ** | ** | | 52* | 59* | 48* | ** | | |
| | | | | | | | | | ** | ** | ** | | | |
| TIP | 0.3 | 0.5 | 0.2 | 0.03 | 0.1 | 0.0 | 0.1 | 0.0 | - | 0.0 | 0.0 | 0.9 | 0.9 | 1. |
| | 64* | 58* | 89* | 7** | 06* | 64* | 18* | 06 | 0.0 | 64* | 68* | 02* | 09* | 00 |
| | ** | ** | ** | * | ** | ** | ** | | 57* | ** | ** | ** | ** | 0 |
| | | | | | | | | | ** | | | | | |

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

Table 4 presents the Pearson correlation coefficients between the various variables. It demonstrates that executive compensation incentives exhibit a positive correlation with the R&D

investment variable. Specifically, they are significantly correlated at the 1% level with R&D capital expenditure. Executive compensation incentives also show a significant positive correlation at the 1% level with substantive innovation performance, strategic innovation performance, and overall innovation performance. Furthermore, the control variables generally exhibit significant correlations with the dependent variable.

4.3 Testing for Multicollinearity

When conducting linear regression analysis, variables exhibiting significant multicollinearity must be excluded to prevent regression errors arising from variable selection. To assess whether the selected explanatory and control variables meet the research criteria of this study, the variance inflation factor (VIF) was employed to examine multicollinearity among variables. The results are presented in Table 5.

Table 5. Variance inflation factor

| | VIF | 1/VIF |
|----------|-------|-------|
| SIZE | 2.044 | .489 |
| LEV | 1.755 | .57 |
| ECIG | 1.498 | .668 |
| ROA | 1.457 | .686 |
| RDI | 1.224 | .817 |
| OWNER | 1.127 | .888 |
| GROWTH | 1.104 | .906 |
| DIR | 1.091 | .917 |
| DUALE | 1.044 | .958 |
| INDIR | 1.008 | .992 |
| Mean VIF | 1.335 | . |

According to existing research findings, in VIF multicollinearity analysis results, when $0 < VIF < 5$, indicating minor multicollinearity between variables, the test for multicollinearity is passed. The table above presents the multicollinearity test results for the VIF variance inflation factor. In the examination of executive compensation incentives and control variables, the minimum VIF is 1.008, the maximum VIF is 2.044, and the average VIF is 1.335. With VIF values ranging between 0 and 5, these two sets of multicollinearity test results meet the relevant criteria. Consequently, it can be concluded that the independent and control variables selected for this section do not exhibit multicollinearity issues.

4.4 Benchmark Regression Analysis

Table 6. Results of benchmark regression.

| | (1) RIP | (2) SIP | (3) TIP |
|--|------------|------------|------------|
|--|------------|------------|------------|

| | | | |
|----------------|-----------|-----------|-----------|
| ECIG | 0.033* | 0.048*** | 0.032** |
| | (1.916) | (2.828) | (2.087) |
| SIZE | 0.528*** | 0.449*** | 0.501*** |
| | (23.234) | (20.850) | (24.461) |
| LEV | -0.208*** | -0.142* | -0.189*** |
| | (-2.611) | (-1.779) | (-2.610) |
| GROWTH | -0.043** | -0.030 | -0.036** |
| | (-2.158) | (-1.500) | (-2.011) |
| OWNER | 0.258* | 0.342** | 0.274** |
| | (1.799) | (2.493) | (2.092) |
| ROA | 0.054 | 0.226 | 0.155 |
| | (0.396) | (1.640) | (1.259) |
| DIR | 0.018 | -0.019 | -0.006 |
| | (0.650) | (-0.682) | (-0.254) |
| INDIR | 0.113 | 0.094 | 0.137** |
| | (1.600) | (1.299) | (2.162) |
| DUALE | 0.046** | -0.005 | 0.032* |
| | (2.359) | (-0.242) | (1.821) |
| _cons | -9.536*** | -7.645*** | -7.947*** |
| | (-17.859) | (-15.231) | (-16.598) |
| ID | YES | YES | YES |
| YEAR | YES | YES | YES |
| N | 16318 | 16318 | 16318 |
| R ² | 0.815 | 0.790 | 0.825 |
| F | 67.683 | 58.500 | 76.705 |

Note: The numbers in parentheses below the regression coefficients are t-values, and *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

The benchmark regression results for executive compensation incentives and corporate innovation performance are presented in Table 6. As individual and year effects were controlled for in the fixed-effects model, the R-squared values for each model hovered around 0.8, indicating satisfactory model fit. Columns 1–3 respectively reflect the impact of executive compensation incentives and control variables on substantive innovation performance, strategic innovation performance, and total innovation performance. The regression results reveal coefficients of 0.033, 0.048, and 0.032 for executive compensation incentives, respectively, indicating a significant positive correlation with substantive innovation performance, strategic innovation performance, and total innovation performance. In terms of significance, executive compensation incentives most strongly promote strategic innovation. Consequently, the hypothesis that executive compensation incentives are significantly positively correlated with corporate innovation performance is validated. The regression results for control variables indicate that larger firm size,

lower debt-to-equity ratios, higher shareholding proportions of the largest shareholder, higher proportions of independent directors, and the dual role of chairman and general manager are associated with greater innovation output and higher innovation performance.

4.5 Robustness Tests

4.5.1 Endogeneity Tests

Table 7 Results of the endogeneity test

| VARIABLES | (1) first ECIG | (2) second RIP | (2) second SIP | (2) second TIP |
|----------------|----------------------|----------------------|----------------------|----------------------|
| L_ECIG | 0.430*** (0.0124) | | | |
| ECIG | | 0.0872** (0.0554) | 0.177*** (0.0566) | 0.124** (0.0512) |
| Controls | YES | YES | YES | YES |
| ID | YES | YES | YES | YES |
| YEAR | YES | YES | YES | YES |
| N | 12,870 | 12,870 | 12,870 | 12,870 |
| R ² | | 0.060 | 0.044 | 0.068 |

Note: The numbers in parentheses below the regression coefficients are t-values, and *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 7 presents all control variables within the model, with corresponding coefficients omitted. Subsequent tables follow this presentation convention. Given that firms with superior innovation performance may offer greater executive compensation incentives, potential reverse causality exists between the independent and dependent variables. Consequently, this study employs instrumental variables to address model endogeneity. One period lagged executive compensation incentives serve as the instrumental variable. Table 7 indicates that the instrumental variable correlates with the firm's executive compensation incentives in the current year while remaining unaffected by the firm's innovation performance in that year, thus satisfying the relevance and exogeneity assumptions. Ultimately, a two-stage least squares (2SLS) approach was employed to examine the relationship between executive compensation incentives and corporate innovation performance, with the results presented in Table 7.

In the first-stage regression, the regression coefficient for lagged executive compensation incentives was 0.430, significantly positive at the 1% level. This indicates a strong correlation between lagged executive compensation incentives and the firm's current executive compensation incentives, thus satisfying the correlation requirement for instrumental variable selection. Simultaneously, a plausibility test was conducted on the selected instrumental variable. The Kleibergen-Paap rk LM statistic was 381.360 ($p=0.0000$), thus confirming no unidentifiable instrumental variables exist. The Kleibergen-Paap rk Wald F statistic (1200.881) exceeds the

critical value (16.38) for the Stock-Yogo weak ID test at the 10% significance level, indicating no weak instrumental variables. Thus, the instrumental variable selection is justified. In the second-stage regression, the coefficient for substantive innovation performance is 0.0872, that for strategic innovation performance is 0.177, and that for total innovation performance is 0.124. These coefficients are significant at the 5% and 1% levels respectively, confirming the conclusions of the baseline regression in this study.

4.5.2 Replacement of Independent Variable

Executive compensation incentives were measured using the ratio of total supervisory remuneration to the total number of supervisory personnel. The regression results are presented in Table 8. These findings align with the benchmark regression results, indicating the robustness of the baseline regression.

Table 8 Results of the robustness test for replacing independent variable

| | (1) RIP | (2) SIP | (3) TIP |
|----------------|------------------------|------------------------|------------------------|
| ECIJ | 0.034* (1.780) | 0.061*** (3.110) | 0.041** (2.344) |
| Controls | YES | YES | YES |
| _cons | -9.567*** (-17.514) | -7.791*** (-15.098) | -8.052*** (-16.392) |
| ID | YES | YES | YES |
| YEAR | YES | YES | YES |
| N | 16324 | 16324 | 16324 |
| R ² | 0.815 | 0.790 | 0.825 |
| F | 67.332 | 58.300 | 76.317 |

Note: The numbers in parentheses below the regression coefficients are t-values, and *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

4.6 Mediating effects Analysis

Building upon the benchmark regression results presented earlier, this study employs a causal stepwise regression approach to examine the mediating effect of digital transformation, drawing upon the research of Wen et al. (2004). This aims to further unravel the "black box" of the operational mechanism through which executive compensation incentives influence corporate innovation performance. Specifically, under the premise that executive compensation incentives exert a significant positive impact on corporate innovation performance, the study further investigates the significance and coefficient characteristics of the effect of executive compensation incentives on corporate R&D investment. Concurrently, we examine the fluctuation range and significance of regression coefficients for executive compensation incentives and R&D investment after incorporating this mediating variable into the baseline regression model. This study

categorizes R&D investment into two dimensions: financial investment in R&D and investment in R&D personnel.

4.6.1 Mediating Effect of R&D Capital Investment

Table 9 Analysis of the Mediating Effect of R&D Capital Investment

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|----------------|----------------------|-----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | RDI | RIP | SIP | TIP | RIP | SIP | TIP |
| ECIG | 0.013*** (25.968) | | | | 0.121*** (9.201) | 0.057*** (3.998) | 0.097*** (7.704) |
| RDI | | 10.137*** (51.343) | 2.904*** (13.659) | 6.883*** (36.486) | 9.765*** (48.562) | 2.731*** (12.605) | 6.586*** (34.262) |
| Controls | YES | YES | YES | YES | YES | YES | YES |
| _cons | 0.038*** (4.934) | - (-68.109) | - (-40.910) | - (-55.744) | - (-63.634) | - (-37.446) | - (-52.164) |
| N | 16486 | 16525 | 16525 | 16525 | 16486 | 16486 | 16486 |
| R ² | 0.183 | 0.395 | 0.257 | 0.365 | 0.398 | 0.259 | 0.368 |
| F | 409.858 | 1198.219 | 635.710 | 1056.60 | 1090.109 | 576.214 | 959.748 |

Note: The numbers in parentheses below the regression coefficients are t-values, and *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

In Table 9, the regression results in Column (1) indicate that the coefficient for the impact of executive compensation incentives on R&D capital investment is 0.013, exhibiting a significant positive correlation at the 1% level. This confirms that executive compensation incentives can stimulate increased corporate investment in R&D capital, thereby validating the hypothesis. Meanwhile, the regression results in Columns 2–4 demonstrate that higher levels of R&D capital investment are more conducive to corporate innovation. Consequently, all prerequisites for testing the mediating effect are satisfied. Therefore, in Tables 5–7, executive compensation incentives, R&D capital investment, and corporate innovation performance were analyzed within a single regression model. The results indicate that executive compensation incentives exert a significant positive influence on corporate innovation performance, while R&D capital also demonstrates a significant positive impact on innovation performance. Consequently, it can be concluded that R&D capital partially mediates the relationship between executive compensation incentives and corporate innovation performance. Consequently, executive compensation incentives can enhance corporate output in substantive and strategic innovation by promoting increased R&D capital. The hypothesis that R&D capital partially mediates the relationship between executive compensation incentives and corporate innovation is thus validated.

4.6.2 Mediating Effect of R&D Personnel Investment

Table 10 Intermediary Effect Analysis of R&D Personnel Investment

| | (1) RDP | (2) RIP | (3) SIP | (4) TIP | (5) RIP | (6) SIP | (7) TIP |
|----------|----------------------|-----------------------------|----------------------------|----------------------------|-----------------------------|----------------------------|-----------------------------|
| ECIG | 0.022*** (15.659) | | | | 0.178*** (13.518) | 0.075*** (5.361) | 0.137*** (10.917) |
| RDP | | 3.339*** (45.888) | 0.832*** (10.748) | 2.193*** (31.702) | 3.219*** (44.122) | 0.776*** (9.967) | 2.099*** (30.201) |
| Controls | YES | YES | YES | YES | YES | YES | YES |
| _cons | 0.294*** (13.810) | - 11.778*** (-67.518) | - 7.511*** (-40.470) | - 9.163*** (-55.237) | - 13.145*** (-65.504) | - 8.093*** (-37.777) | - 10.216*** (-53.447) |
| N | 16486 | 16525 | 16525 | 16525 | 16486 | 16486 | 16486 |
| R2 | 0.099 | 0.378 | 0.254 | 0.354 | 0.385 | 0.256 | 0.359 |
| F | 201.222 | 1114.222 | 625.199 | 1003.748 | 1030.291 | 568.253 | 921.073 |

Note: The numbers in parentheses below the regression coefficients are t-values, and *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

The regression results in Column 1 of Table 10 indicate that the coefficient for the impact of executive compensation incentives on R&D personnel investment is 0.022, exhibiting a significant positive correlation at the 1% level. This confirms that executive compensation incentives can encourage enterprises to increase their investment in R&D personnel, thereby validating the hypothesis. Meanwhile, the regression results in Columns 2–4 demonstrate that a higher proportion of R&D personnel within an enterprise is more conducive to fostering innovation.

Based on this, all prerequisites for testing the mediating effect are satisfied. Therefore, in Tables 5-7, executive compensation incentives, R&D personnel investment, and corporate innovation were analysed within a single regression model. The results indicate that executive compensation incentives exert a significant positive influence on corporate innovation performance, while R&D personnel investment also demonstrates a significant positive impact on corporate innovation. Consequently, it can be concluded that R&D personnel investment partially mediates the relationship between executive compensation incentives and corporate innovation. Consequently, executive compensation incentives can enhance corporate output in substantive and strategic innovation by promoting increased R&D personnel investment. The hypothesis that R&D personnel investment partially mediates the relationship between executive compensation incentives and corporate innovation is thus validated.

The analysis reveals that when incorporating R&D investment as a mediating variable, both financial R&D investment and personnel investment in R&D exert a mediating effect between executive compensation incentives and corporate innovation performance. This mediating effect is partially mediated.

4.7 Heterogeneity Analysis

The subsequent sections of this study focus on analysing heterogeneity from perspectives such as the geographical location of enterprises and the nature of their ownership structures,

thereby explaining the variation in the impact of senior management equity incentives on corporate innovation performance.

4.7.1 Region

At the regional level, enterprises are categorised into eastern-central and western regions based on their provincial affiliation. Regression results indicate that the impact of executive compensation incentives on corporate innovation performance exhibits marked regional heterogeneity. Such incentives exert a significant positive influence on innovation performance in eastern-central enterprises, with effects on all three innovation performance metrics proving statistically significant at both the 1% and 5% levels. For enterprises in the western regions, executive compensation incentives exerted no significant influence on various innovation performance metrics. In the case of western enterprises, executive pay incentives failed to stimulate innovation output. Companies based in the western regions may face relative disadvantages in economic resources and talent pools compared to their counterparts in the eastern and central regions, thereby hindering innovation development.

Table 11 Regional Heterogeneity Analysis

| | Eastern and Central Regions | | | Western Regions | | |
|----------|-----------------------------|------------------------|------------------------|-----------------------|-----------------------|-----------------------|
| | (1) RIP | (2) SIP | (3) TIP | (4) RIP | (5) SIP | (6) TIP |
| ECIG | 0.049*** (2.678) | 0.044** (2.444) | 0.036** (2.212) | -0.051 (-1.050) | 0.072 (1.519) | 0.013 (0.294) |
| Controls | YES | YES | YES | YES | YES | YES |
| _cons | -9.802*** (-17.180) | -7.619*** (-14.153) | -8.097*** (-15.753) | -6.856*** (-4.506) | -7.689*** (-5.417) | -6.283*** (-4.799) |
| ID | YES | YES | YES | YES | YES | YES |
| YEAR | YES | YES | YES | YES | YES | YES |
| N | 14345 | 14345 | 14345 | 1969 | 1969 | 1969 |
| R2 | 0.818 | 0.792 | 0.828 | 0.798 | 0.777 | 0.804 |
| F | 61.793 | 52.045 | 69.857 | 10.022 | 8.158 | 9.917 |

Note: The numbers in parentheses below the regression coefficients are t-values, and *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

4.7.2 Nature of the Enterprise

Table 12 Analysis of Corporate Heterogeneity

| | state-owned enterprise | | | non-state-owned enterprise | | |
|----------|------------------------|------------------|--------------------|----------------------------|---------------------|---------------------|
| | (1) RIP | (2) SIP | (3) TIP | (4) RIP | (5) SIP | (6) TIP |
| ECIG | -0.048* (-1.749) | 0.009 (0.329) | -0.023 (-0.901) | 0.092*** (4.213) | 0.066*** (3.087) | 0.068*** (3.517) |
| Controls | YES | YES | YES | YES | YES | YES |

| | | | | | | |
|-------|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| _cons | -10.803*** (-10.697) | -9.859*** (-10.010) | -9.734*** (-10.394) | -9.775*** (-14.968) | -7.078*** (-11.765) | -7.731*** (-13.461) |
| ID | YES | YES | YES | YES | YES | YES |
| YEAR | YES | YES | YES | YES | YES | YES |
| N | 5700 | 5700 | 5700 | 10578 | 10578 | 10578 |
| R2 | 0.867 | 0.820 | 0.867 | 0.772 | 0.771 | 0.793 |
| F | 28.119 | 28.069 | 33.534 | 44.453 | 34.163 | 48.628 |

Note: The numbers in parentheses below the regression coefficients are t-values, and *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

At the level of enterprise ownership structure, this study specifically examines the impact of executive compensation incentives on corporate innovation performance within state-owned and non-state-owned enterprises. Regression results indicate that the effect of executive compensation incentives on innovation performance exhibits significant heterogeneity across different ownership structures. Overall, following the implementation of executive compensation incentives in non-state-owned enterprises, the impact on substantive innovation performance, strategic innovation performance, and total innovation performance is statistically significant at the 1% level.

5. Conclusions and Recommendations

5.1 Research Findings

This study employs benchmark regression analysis and robustness tests to empirically examine the underlying mechanisms linking executive compensation incentives, research and development expenditure, and corporate innovation performance, based on data from Chinese A-share listed companies between 2014 and 2023. The findings ultimately conclude that:

Executive compensation incentives enhance substantive innovation performance, strategic innovation performance, and overall innovation performance in Chinese enterprises.

Both R&D capital and personnel investment mediate the relationship between executive compensation incentives and substantive innovation performance, strategic innovation performance, and overall innovation performance. Executive compensation incentives can drive improvements in corporate innovation performance by encouraging increased R&D investment. This mediating effect holds true in the relationships between executive compensation incentives and corporate substantive innovation performance, strategic innovation performance, and overall innovation performance.

Heterogeneity analysis based on regional location reveals that executive compensation incentives exert a more pronounced effect on fostering innovation performance in enterprises situated in eastern and central regions, whereas their impact on western regions proves insignificant. Analysis based on ownership structure indicates that such incentives demonstrate a more marked effect in enhancing innovation performance within non-state-owned enterprises, while their influence on state-owned enterprises remains negligible.

5.2 Policy Recommendations

5.2.1 Refine executive remuneration incentive schemes and elaborate on executive assessment programmes

Remuneration constitutes the primary component of executive compensation, with pay incentives serving as a significant factor influencing managerial decision-making. A well-designed and effective executive remuneration incentive scheme can mitigate conflicts of interest between shareholders and management, curb short-termism among executives, thereby aligning the interests of management with those of shareholders. Therefore, when designing executive remuneration incentive schemes, explicit and implicit incentives may be combined. Current research findings indicate that while executive compensation incentives promote both substantive and strategic innovation, their effect on strategic innovation is more pronounced. This indicates that senior executives tend to favour strategic innovation activities with relatively lower difficulty, risk, and timeframes when selecting innovation initiatives. Consequently, when formulating executive assessment schemes, innovation activities may be categorised with corresponding innovation metrics established, thereby enabling executive decisions to contribute more substantially to the organization's substantive innovation efforts. Furthermore, given the regional and property rights-based heterogeneity in how executive compensation incentives influence corporate innovation performance, enterprises should tailor executive incentive measures according to their specific characteristics and regional context.

5.2.2 Increase investment in research and development to foster high-quality innovation outputs within enterprises

Investment in research and development capital constitutes the most direct driver of corporate innovation. Only by increasing R&D investment can enterprises fully leverage their central role in technological innovation decision-making, R&D investment and the commercialisation of outcomes. This maximises the utilisation of innovation resources, enhances innovation efficiency, and consequently elevates corporate innovation performance. Research and development personnel serve as the pivotal agents driving technological innovation within enterprises, with the success of scientific endeavours being contingent to a significant degree upon the calibre of such personnel within the organization. Providing R&D staff with an environment conducive to innovation, opportunities for education and training, platforms for enhancing professional skills, and appropriate incentive schemes all serve to stimulate their innovative passion and motivation. This enables them to engage more effectively in the enterprise's research and development activities, thereby enhancing the organization's innovation output.

References:

Chang, Y. & Han, Y. (2024). Executive compensation incentives, agency conflicts and high-quality corporate development in manufacturing: Evidence from moderation and threshold

- effects. *Journal of Jiangxi University of Science and Technology*, 45(03), 54-64. <https://doi.org/10.13265/j.cnki.jxlgdxxb.2024.03.007>.
- Dong, H. J., & Qin, M. K. (2023). Executive incentives, audit quality and corporate innovation. *Accounting Friend*, (14), 28-34.
- Du, Y., Sun, F., & Deng, X. (2021). Co-ownership structure and corporate earnings management. *China Industrial Economics*, (06), 155-173. <https://doi.org/10.19581/j.cnki.ciejournal.2021.06.010>.
- Li, W. J., & Zheng, M. N. (2016). Substantive innovation or strategic innovation? The impact of macro industrial policy on micro-level enterprise innovation. *Economic Research Journal*, 51(04), 60-73.
- Li, Y. X., & Shen, K. J. (2023). Management incentives, equity structure and r&d investment: an empirical study based on chinext listed companies. *Modern Business*, (16), 165-168. <https://doi.org/10.14097/j.cnki.5392/2023.16.022>.
- Liu, G. X., Huang, Zh. Y., & Xu, Y. N. (2024). The impact of government support and executive incentives on corporate R&D investment: a fuzzy set qualitative comparative analysis of chinext listed companies. *Science and Technology Entrepreneurship Monthly*, 37(01), 7-13. <https://doi.org/CNKI:SUN:KJCK.0.2024-01-002>.
- Liu, Y. J., Yang, Y. Q., & Zhao, J. W. (2024). The impact of corporate governance structures on enterprise innovation performance: Mediating effects of R&D investment. *Market Weekly*, 37(28), 1-4. <https://doi.org/CNKI:SUN:SCZK.0.2024-28-001>.
- Lv, J. (2023). The impact of compensation incentives on corporate innovation: tournament theory or principal-agent theory? *Technology and Economy*, 42(11), 93-102.
- Lu, N. (2025). The impact of executive incentives on breakthrough innovation in enterprises. *Times of Economic and Trade*, 22(08), 121-125. <https://doi.org/10.19463/j.cnki.sdjm.2025.08.019>.
- Ma, S. (2023). Internal pay gaps and corporate innovation in the context of common prosperity. *Accounting Friend*, (08), 150-156.
- Miao, S. J., Xia, M., & Meng, Q. S. (2018). The influence of executive incentives on R&D investment: The moderating role of ultimate control. *Industrial Technology Economics*, 37(01), 41-48.
- Peng, W. B., & Xie, X. Q. (2023). Managerial capability, policy uncertainty and corporate green innovation: an empirical analysis based on the threshold effect model. *Business Research*, 30(01), 27-35.
- Qin, X. H., & Huang, G. L. (2020). Can tax incentives enhance the efficiency of inventive innovation in high-tech enterprises? *Accounting Monthly*, 21, 113-119. <http://doi.org/10.19641/j.cnki.42-1290/f.2020.21.018>
- Qu, X. H., Wang, J., & Zhang, R. L. (2022). The incentive effects of tax rate preferences on innovation output. *Accounting Monthly* (12), 16-25. <http://doi.org/10.19641/j.cnki.42-1290/f.2022.12.002>

- Ren, G. Q., Feng, R. R., & Zhen, C. X. (2022). State holding, executive incentives and corporate innovation efficiency. *Economic System Reform*, (02), 187-194.
- Wang, L., & Wang, D. (2025). The impact of executive compensation incentives on true earnings management: the moderating role of equity incentives and independent directors. *Modernisation of the Marketplace*, (20), 146-150. <https://doi.org/10.14013/j.cnki.scxdh.2025.20.055>.
- Wang, Y. N. (2011). A study on the impact of executive incentives on r&d investment: an empirical examination of listed manufacturing companies in China. *Research on Science Studies*, 29(07), 1071–1078. <http://doi.org/10.16192/j.cnki.1003-2053.2011.07.011>
- Wen, Z., Zhang, L., Hou, J. T., & Liu, H. Y. (2004). Testing procedures for mediating effects and their application. *Acta Psychologica Sinica*, (05), 614-620.
- Weng, C., & Ma, L. (2022). Executive compensation incentives and corporate innovation: empirical evidence from chinese listed companies. *Journal of Chongqing University (Social Sciences Edition)*, 28(03), 67-81.
- Wu, Y. K., & Huang, Z. M. (2024). A review of research on the impact of executive incentives on corporate innovation. *Modern Business*, (10), 129–132. <https://doi.org/10.14097/j.cnki.5392/2024.10.015>.
- Yi B., & Cai, H. (2023). The impact of executive incentives on corporate innovation performance: a moderating effect of executive risk preference. *Journal of Dezhou University*, 39(06), 67-75. <https://doi.org/CNKI:SUN:DZHX.0.2023-06-012>.
- Yi, B., & Wang, X. Y. (2025). Executive incentives, media attention and innovation performance in manufacturing enterprises. *Journal of Jilin University of Business and Technology*, 41(01), 51-58+127. <https://doi.org/10.19520/j.cnki.issn1674-3288.2025.01.005>.
- Yin, X., Ming, H., & Geng, J. (2021). The impact of executive compensation incentives on corporate resource allocation efficiency: A perspective based on property rights and industry heterogeneity. *China Soft Science (S1)*, 260-267.
- Zhang, J., Lu, Ch. J., & Na, X. (2022). Executive incentives, independent directors and corporate innovation quality. *Yunnan Social Sciences* (03), 74-83.
- Zhang, H. L., Li, C. X., & Wang, J. Y. (2024). Executive compensation structure and corporate innovation: An executive risk-taking perspective. *Journal of Beijing Technology and Business University (Social Sciences Edition)*, 39(02), 85-99.
- Zhao, P. J. (2024). An empirical study on the impact of executive compensation in listed manufacturing enterprises on corporate performance. *Modern Marketing*, (18), 153-155. <https://doi.org/10.19932/j.cnki.22-1256/F.2024.06.153>.
- Zhou, Sh., & Liu, G. Ch. (2025). Executive incentives, internal control quality and technological innovation. *Research on Technology Economics and Management*, (01), 146-152. <https://doi.org/CNKI:SUN:JXJG.0.2025-01-023>.