

Internal & External Pay Dispersion of Executives and Enterprise Innovation

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Abstract. Innovation is the source of sustainable development of enterprises. Therefore, its influencing factors have long received extensive attention from academia. This paper takes China's A-share listed companies from 2008 to 2017 as a research sample to examine the relationship between the internal & external pay dispersion of executives and corporate innovation. The results show that: the internal pay dispersion of executives promotes the innovation of the enterprise; the external pay dispersion of the executives inhibits the innovation of the enterprise; the external pay dispersion of the executives enhances the positive effect of the internal executive pay dispersion on the innovation of the enterprise. Further, it is found that compared with non-state-owned enterprises, the internal pay dispersion of state-owned enterprises has a smaller role in promoting the innovation of the enterprise, and the external pay dispersion of executives has a smaller inhibitory effect on the innovation of the enterprise. Executive power enhances the positive effect of the internal pay dispersion on the innovation of the enterprise, and also strengthens the inhibitory effect of the external pay dispersion on the innovation of the enterprise. The above research findings reveal the intrinsic relationship between executive compensation incentive policies and corporate innovation, and provide a theoretical reference for companies to establish efficient incentive mechanisms and promote corporate innovation and development.

Keywords: pay gap; corporate innovation; executive power; nature of property rights.

1. Introduction

Innovation is an important source of an enterprise's competitive advantage and the backbone for sustainable development of enterprises. It enjoys a core position in the overall situation of China's modernization. President Xi Jinping pointed out that innovation is the soul of a nation's progress and the driving force for a country's prosperity. With the economic globalization and regional economic integration in today's world, many industries and enterprises in China still have low self-sufficiency of core technology and high external dependence, which leads to weak competitiveness of Chinese enterprises in international competition [1]. Therefore, the establishment and improvement of efficient enterprise innovation incentive mechanism is of great significance to the improvement of the competitiveness of Chinese enterprises, the progress of the nation and the prosperity of the country.

Different from other strategic decisions of enterprises, corporate innovation activities involve many risks and uncertainties, failure is highly possible and it is difficult to have returns in the short term. Considering their own career security and personal income stability, managers are often reluctant to carry out high-risk innovation activities [2]. Therefore, how to motivate executives to promote corporate innovation has become a hot topic in business and academia. Extant literature focuses on this issue from the perspective of absolute compensation incentives for individual executives or groups, but the executive team is not only an economic person who seeks absolute incentives, but also a social person who pays attention to relative incentives. The incentive fairness and incentive gap within the executive group will also significantly affect executives' innovative decision-making and behavior. In recent years, scholars at home and abroad have begun to pay attention to the incentive effect of the internal executive pay dispersion, and two representative schools of tournament theory and behavior theory [2] have formed. Proponents of tournament theory argue that employee compensation levels jump up and down the ladder with job promotion, and that employees are motivated to work hard to gain promotion opportunities before the results of the promotion are clear. At the same time, since tournament incentives have convex characteristics

similar to stock options, they will also increase the risk-taking level of tournament participants to increase the probability of winning. Therefore, related studies have shown that tournament incentives can promote corporate innovation. The "Behavioral Theory" suggests that the stronger the tournament incentive, the larger the pay gap. And the excessive pay gap will increase people's sense of unfairness, which will lead to psychological imbalance, reduce employee satisfaction, and even lead to political intrigue and self-interested behavior. Destroying the cooperation between teams is detrimental to enterprise innovation. In addition, external tournaments have gradually become a hot topic in tournament incentive research recently. The incentive methods of external tournaments and internal tournaments are different: the incentive mode of internal tournaments is that corporate executives get promoted inside the companies, while the external tournaments are that corporate executives move to higher-paid companies in the external labor market [3]. Coles et al. [4] and Mei Chun et al. [3] used the pay gap between CEOs and the industry's highest paid CEOs to measure tournament incentives, and found that industry tournaments promote corporate performance, executive risk-taking and corporate innovation.

Although there are a large number of studies from the perspective of relative incentives, there still are following possible research gaps: (1) The effect of internal executive pay dispersion on corporate innovation is still controversial; (2) The empirical evidence of the influence external tournaments have on corporate innovation is still insufficient; (3) When affecting corporate innovation, the interactive effect of internal and external tournaments is still unclear. In view of this, this paper uses the data of China's A-share listed companies from 2008 to 2017 as the research sample, focusing on the impact of the internal executive pay dispersion and the executive external pay dispersion on corporate innovation. The research results show that the internal pay dispersion of executives has a significant positive impact on the innovation of enterprises; the external pay dispersion of executives has a significant inhibitory effect on the innovation of enterprises; the external pay dispersion of executives further strengthens the internal pay dispersion of executives. Further, it is found that compared with non-state-owned enterprises, the internal pay dispersion of state-owned enterprises has a smaller role in promoting the innovation of the enterprise, and the external pay dispersion of executives has a smaller inhibitory effect on the innovation of the enterprise. Managers' power enhances the positive effect of the internal executive pay dispersion on the innovation of the enterprise, and also strengthens the inhibitory effect of the external executive pay dispersion on the innovation of the enterprise.

2. Theoretical Analysis and Research Assumptions

(1) Internal pay dispersion and corporate innovation

According to the principal-agent theory, there are differences in the goals and interests pursued by the agent and the principal in an enterprise when management rights and ownership are separated [5]. Innovation is the source of power for enterprise development. Shareholders hope that enterprises can enhance corporate value and promote sustainable development through effective innovation. However, corporate innovation activities are characterized by high investment, high risk and long-term nature, and executives are often reluctant to innovate considering their own occupation safety and salary stability [5]. Since the establishment of the executive compensation system, it has become the key to solving the conflicting interests between the management team and shareholders [6]. The theoretical base of the championship theory is that the salary level rises with the rise of the position, and the pay dispersion is an additional reward for employees' hard work. Championship theory suggests that widening the pay dispersion can mobilize the enthusiasm of low-level personnel, motivate them to work hard for promotion and high salary, at the same time ensure that high-level personnel are motivated by their own high salary, so that they can improve their income and status stability and work efficiency [7]. Therefore, increasing the incentives of internal tournaments can alleviate the agency problem between executives and shareholders in terms of enterprise innovation, reduce the monitoring cost of the principal over the agent, and promote the consistency of interests

between the principal and the agent, so as to improve the level of enterprise innovation. If executives want to win the tournament, they are bound to choose more risky investment projects, since high-risk investment projects also bring high returns, which can help executives increase competitive output and thus improve the odds of winning the tournament [8]]. The larger the pay dispersion within the enterprise, the stronger the incentive effect of the championship, the more likely the executives are to actively improve their risk-taking level [2], and the more likely they are to promote the innovation of the enterprise, thereby improving the innovation level of the enterprise. Based on the above analysis, this paper proposes the following hypothesis 1:

H1: The internal pay dispersion of executives has a significant positive impact on the innovation of enterprises.

(2) External pay dispersion and corporate innovation

Corporate executives will not only participate in internal championship competition, but also participate in external championship competition in external labor market because of labor mobility. Therefore, the incentive effect of external pay dispersion on corporate executives is worth exploring. Existing studies have found that industry and company size are important factors for the board of directors to formulate executive compensation reference companies [9]. The external championship incentives measured by the pay dispersion of CEOs in the same industry are positively correlated with company performance and company risk. The high-pay of corporate executives will have an incentive effect on other corporate executives with lower salaries [4]. There is information asymmetry between corporate executives in the external labor market and the boards of other companies, and the boards of other companies can only evaluate the ability of executives based on the performance of the company they work for during their tenure [10]. Inspired by external tournaments, corporate executives are motivated to improve company performance. The larger the external pay gap, the stronger the motivation for executives to improve company performance, and the more likely they are to choose higher-risk innovative projects to improve the odds of winning the external tournament. At the same time, the external championship pushes the company executives to pay attention to the company with higher-paid executives. Through comparison between the two companies, the company's executives learn its management model and superior technology, and apply it to the company they manage to promote the company's performance improvement and innovation development. Some studies have found that incentive programs that can accept early failure and reward long-term success can more effectively motivate executives to innovate [11]. External tournaments have a convex revenue structure similar to stocks, which can accept early failures and reward long-term success in motivating executives to innovate, and can effectively motivate corporate innovation. The external championship will only end after the top -paid executive leaves, which is a long-term process [12]. The company's high-performing executives have the opportunity to serve as executives in higher-paid companies, even if they do not get this opportunity, the potential external promotion opportunities will also add pressure on the company's board of directors, forcing the board to increase their compensation to retain executives. And even if the executives do not win the external tournament, the executives are unlikely to be reduced or fired, so the external tournament also has the characteristics of tolerance for early failure [12]. Based on the above analysis, this paper proposes the following hypothesis 2:

H2: The external pay dispersion has a significant positive impact on the innovation of enterprises.

3. Research design

3.1 Sample selection and data sources

This paper chooses China's A-share listed companies from 2008 to 2017 as the research sample, and the data are obtained from the CSMAR database. The samples were screened according to the following conditions: (1) Exclude the sample of financial companies; (2) Exclude ST companies; (3) Exclude the sample of companies with missing relevant data; (4) Exclude the number of companies in the industry less than 5 samples. In order to avoid the influence of extreme values on the research

results, extreme 1% continuous variables were removed, and STATA software was applied for statistical analysis of the data.

3.2 Model settings and variable definitions

3.2.1 Model settings

In order to verify the hypothesis, this paper adopts the following model to test the relationship between internal and external pay dispersion and enterprise innovation, based on the research of Xie Weimin [1], Mei Chun et al. [3] and Zeng Chunhua et al. [2]:

$$\text{Innovation}_{i,t} = \alpha_0 + \alpha_1 \text{Innerpaygap}_{i,t} + \alpha_m \text{Controls}_{i,t} + \text{Industry_FE} + \text{Year_FE} + \varepsilon_{i,t} \quad (1)$$

$$\text{Innovation}_{i,t} = \alpha_0 + \alpha_1 \text{Outerpaygap}_{i,t} + \alpha_m \text{Controls}_{i,t} + \text{Industry_FE} + \text{Year_FE} + \varepsilon_{i,t} \quad (2)$$

i denotes the enterprise, t denotes the year, Innovation denotes the innovation variable of the enterprise, Innerpaygap denotes the internal pay gap, Outerpaygap denotes the external pay gap, Controls denotes the CEO characteristic variable, company characteristic variable and other control variables, Industry_FE denotes the industry fixed effect, Year_FE denotes the fixed effect of year.

3.2.2 Variable definitions

(1) Enterprise innovation

Based on the research of Kong Dongmin [7], Meichun et al. [3], Fu Qi et al. [6], invention patents can bring higher output benefits to enterprises, and due to the lag in patent authorization, the patent application year can be more accurate to reflect innovation. Therefore, this paper uses the natural logarithm of the number of corporate invention patent applications plus one to measure corporate innovation.

(2) Internal pay gap

Based on the research of Zeng Chunhua et al. [2], this paper uses the natural logarithm of the average salary of the top three directors, supervisors, and senior directors of the company minus the average salary of other directors, supervisors, and senior directors of the company to measure the internal pay dispersion.

(3) External pay gap

Based on the research of Mei Chun et al. [3] and Coles et al. [4], this paper uses the natural logarithm of the salary of the highest paid CEO in the company's industry minus the salary of the company's CEO to measure the external pay dispersion. The CEO defined in this paper includes general manager, CEO and president. This paper classifies listed companies according to the 2012 industry classification standard of the China Securities Regulatory Commission. The manufacturing industry follows a two-digit industry code, and other industries use a one-digit industry code.

(4) Control variables

Based on the researches of Xie Weimin et al. [1], Kong Dongmin et al. [7], Mei Chun et al. [3], Zeng Chunhua et al. [2], this paper controls the size of the enterprise (Size), the financial leverage (Lev), and the operating cash flow (Cfo) of the enterprise, ownership (State), the shareholding ratio of the largest shareholder (Lash), company performance (Roa), management shareholding ratio (Mh), and managerial power (Dual). In addition, this paper also introduces fixed effects of industry and year into the model to control the impact of industry and macro factors on firm innovation. The definitions of specific variables are shown in Table 1.

Table 1. Variable Definition Table

Variable	Definition	Measurement
Innovation	Enterprise innovation	Ln (number of enterprise invention patent applications + 1)
Innerpaygap	Internal pay gap	Ln (the average salary of the company's top three directors, supervisors and high-ranking directors - the average salary of the

Outerpaygap	external pay gap	company's other directors, supervisors and high-ranking directors) Ln (salary of the highest paid CEO in the company's industry - salary of the company's CEO)
Size	Enterprise size	Ln (total corporate assets)
Lev	financial leverage	Total liabilities divided by/total assets
Cfo	business cash flow	Net cash/total assets from business operations
State	nature of ownership	1 for state-owned enterprises, 0 otherwise
Lash	Shareholding ratio of the largest shareholder	Shareholding ratio of the largest shareholder of the company
Roa	Corporate Performance	Company Net Profit/Total Assets
Mh	Management shareholding ratio	Number of shares held by management/total share capital
Dual	executive power	When the two positions of chairman and general manager are combined, take 1, otherwise take 0
Industry	Industry dummy variable	According to the SFC's industry classification standards
Year	annual dummy variable	The annual interval is 2008-2017

4. Empirical Results and Analysis

4.1 The regression results of the internal pay dispersion of executives and the innovation of enterprises

Model (1) in Table 2 shows the regression results of the internal executive pay dispersion and corporate innovation. It can be seen that the regression coefficient of Innerpaygap is 0.0610, which is significant at the 1% level, indicating that the internal executive pay dispersion has a significant impact on the enterprise. There is a significant positive impact on innovation, and hypothesis H1 is verified.

Table 2. Regression results of executive pay dispersion and corporate innovation

variable	Innovation	Innovation	Innovation
	(1)	(2)	(3)
Innerpaygap	0.0610*** (5.01)		0.0568*** (4.58)
Outerpaygap		-0.0726*** (-2.97)	-0.0577** (-2.31)
Innerpaygap*Outerpaygap			0.0288* (1.83)
Size	0.5145*** (38.16)	0.5263*** (39.9)	0.5140*** (38.04)
Lev	-0.0992 (-1.37)	-0.107 (-1.48)	-0.1 (-1.38)
Cfo	0.069 (0.35)	0.1189 (0.6)	0.0604 (0.3)
State	0.1316*** (4.74)	0.1159*** (4.19)	0.1320*** (4.75)
Lash	-0.0020** (-2.57)	-0.0022*** (-2.84)	-0.0020** (-2.56)
Roa	2.8725*** (9.34)	3.0149*** (9.83)	2.8594*** (9.31)
Mh	0.0016** (2.44)	0.0015** (2.23)	0.0016** (2.43)

Dual	0.0720*** (2.83)	0.0782*** (3.08)	0.0729*** (2.87)
Constant	-11.0859*** (-38.29)	-9.7009*** (-21.57)	-10.2958*** (-21.91)
industry	control	control	control
years	control	control	control
N	11576	11,576	11576
Adj-R2	0.302	0.301	0.302

Note: *, **, *** indicate significance at the 10%, 5% and 1% levels, respectively; the values in parentheses are t-statistics corrected with robust standard errors, the below goes the same.

4.2 The regression results of executive external pay dispersion and enterprise innovation

Model (2) in Table 2 shows the regression results of executive external pay dispersion and corporate innovation. It can be seen that the regression coefficient of Outerpaygap in the table is -0.0726, and it is significant at the 1% level, which is consistent with the hypothesis H2. The external pay dispersion of executives has a strengthening effect on the innovation of enterprises. On the contrary, the hypothesis H2 is not verified.

It is believed that this result may be due to the following reasons: First, China's labor market is not yet sound, information asymmetry is serious, labor mobility is hindered, executives are less likely to obtain external promotion through innovation to improve company performance, and external tournaments are less likely to be promoted. The incentive effect is weak. Second, the larger the external pay dispersion is, the more likely it is that executives have a sense of unfairness and dissatisfaction, leading them to seek alternative compensation to make up for the loss of formal contracts[13], thereby increasing the cost of principal-agent, and even more detrimental to the innovation of enterprises.

4.3 The interaction between the internal and external pay dispersion of executives and the regression results of enterprise innovation

Model (3) in Table 2 shows the regression results of the interaction between the internal and external pay gap of executives on the innovation of enterprises. The coefficient of Innerpaygap is positive, which further verifies Hypothesis 1. At the same time, the regression coefficient of Outerpaygap is significantly negative, indicating that after controlling the internal pay dispersion of executives, the external pay dispersion of executives will still inhibit corporate innovation. The interaction item of the internal and external pay dispersion of executives is significantly positive, indicating that the increase of the external pay dispersion of executives will further strengthen the promotion of the internal and external pay dispersion of executives on the innovation of enterprises. This may be due to the lack of market liquidity and imperfect market for external managers, resulting in insufficient external promotion channels and promotion space for executives. When the external pay dispersion of executives increases, the willingness of executives to participate in external tournaments further declines, thereby reducing the energy used to participate in and win internal tournaments so as to get promotion in the internal labor market. This is a realistic manifestation of executives' worry of little or unequal pay. There is a significant transfer effect between the two. That is, the external gap can only be filled by internal promotion. Due to the imperfection of the external manager market, the external pay dispersion of executives may lead to a more serious agency problem, making the negative effect difficult to be compensated by external promotion. Therefore, the "worry of little pay" effect caused by the external pay dispersion has triggered the inhibitory effect on innovation, and there is no external market compensation mechanism. However, compared with the worry of little pay, the executives are more worried about the unfairness of pay. The reason is that when the internal promotion mechanism is more sound and the uncertainty is lower than that of the external promotion, the senior executives will transfer the worry of little pay to the worry of the unfairness of pay by striving to innovate and improve performance to get promotions to make up for the "unequal" internal compensation, and win the internal championship.

5. Further Discussion

5.1 Pay dispersion, property rights and corporate innovation

In order to test whether the relationship between pay dispersion and enterprise innovation is different in enterprises with different property rights, this paper constructs the interaction terms of the internal pay dispersion of executives and property rights, and the external pay dispersion of executives and the nature of property rights. The estimated results are shown in the table below. It can be seen that the coefficient of Innerpaygap *State is significantly negative, indicating that the internal pay dispersion of executives has a greater effect on the innovation of non-state-owned enterprises than state-owned enterprises; while the coefficient of Outerpaygap *State is significantly positive, indicating that the external pay dispersion of executives has a significant impact on the innovation of non-state-owned enterprises. The inhibitory effect of innovation of non-state-owned enterprises is greater than that of state-owned enterprises.

First of all, state-owned enterprises need to bear the burden of economic growth and unemployment control from the government. They cannot simply pursue business performance. More importantly, they should fulfil the goals assigned by the government [14]. The effect of enterprise value on the future compensation of executives is limited, internal tournaments are relatively less attractive to SOE executives, so the internal pay dispersion has a weaker role in promoting SOEs' innovation. Secondly, the remuneration system of state-owned enterprises is quite different from that of other enterprises. The remuneration of state-owned enterprises is characterized by rigidity and lag, and the salary limit order restricts the maximum remuneration of executives of state-owned enterprises. At the same time, state-owned enterprises generally have multiple non-monetary alternative remunerations, and their executives pay more attention to future political promotion and less attention to the improvement of labor market value [3]. In state-owned enterprises, the external pay dispersion of executives has a weak inhibitory effect on the innovation of state-owned enterprises.

5.2 Pay gap, executive power and corporate innovation

Based on the research of Zeng Chunhua et al. [2], this paper uses manager duality to measure executive power, and constructs the interaction between the internal pay dispersion of executives and the duality of two positions, and the interaction between the external pay dispersion of executives and the integration of two positions. To test whether the relationship between executive pay gap and corporate innovation is different in companies with different levels of executive power. The regression results are shown in Table 3, model (6) and model (7). The regression coefficient of Innerpaygap *Dual is significantly positive, indicating that in companies with greater executive power, the internal pay dispersion of executives has a greater role in promoting the innovation of enterprises. This paper believes that this result can be explained as follows: the combination of two positions can form a power center, increase the authority of the management, effectively avoid multiple command, reduce the information exchange barriers and decision-making conflicts between the chairman and the executives, and help quickly form a business decision-making strategy [15]. At the same time, the combination of two roles reflects shareholders' trust in executives, which may stimulate the tendency of executives to be stewards. They will use the power advantage of the combination of two roles to continue to improve the innovation performance of the company and maintain their own salary advantages.

However, the regression coefficient of Outerpaygap * Dual is significantly negative, indicating that in companies with greater executive power, the inhibitory effect of external tournaments on corporate innovation will be further strengthened. This paper believes that when there is a duality of two positions in the enterprise, that is, when the executives have greater power, if the external pay dispersion of executives is too large, it will further strengthen the sense of unfairness of executives, leading to more serious principal-agent problems. Compared to smaller companies, executives are less supervised by the board of directors, and they tend to increase their leisure time, increase on-the-

job consumption, and engage in moral hazard behaviors such as sabotage. More serious agency problems may result in lower innovation.

Table 3. Regression results of pay gap, property rights, executive power and corporate innovation

variable	Innovation (4)	Innovation (5)	Innovation (6)	Innovation (7)
innerpaygap	0.0624*** (5.14)		0.0628*** (5.15)	
outerpaygap		-0.0754*** (-3.09)		-0.0741*** (-3.03)
Innerpaygap *State	-0.0556** (-2.43)			
Outerpaygap *State		0.1388*** (4.42)		
Innerpaygap *Dual			0.0643** (2.35)	
Outerpaygap *Dual				-0.0787** (-2.08)
Size	0.5160*** (38.17)	0.5253*** (39.83)	0.5147*** (38.2)	0.5262*** (39.9)
Lev	-0.1114 (-1.53)	-0.1036 (-1.43)	-0.1059 (-1.46)	-0.106 (-1.46)
Cfo	0.0629 (0.32)	0.1345 (0.68)	0.0628 (0.32)	0.1229 (0.62)
State	0.1333*** 4.81	0.1103 *** 3.99	0.1329 *** 4.78	0.1156 *** 4.18
Lash	-0.0020 *** (-2.63)	-0.0021 *** (-2.76)	-0.0019 ** (-2.53)	-0.0022 *** (-2.84)
Long	2.8843 *** 9.38	3.0032 *** 9.8	2,8724 *** 9.34	3.0056 *** 9.79
Mh	0.0017 *** (2.59)	0.0015 ** (2.3)	0.0017 ** (2.55)	0.0015** (2.23)
Dual	0.0706*** (2.78)	0.0786*** (3.09)	0.0666*** (2.63)	0.0832*** (3.25)
Constant	-11.1468*** (-38.27)	-9.6166*** (-21.35)	-11.1174*** (-38.38)	-9.6678*** (-21.46)
industry	control	control	control	control
years	control	control	control	control
N	11576	11576	11576	11576
Adj-R2	0.302	0.302	0.302	0.301

5.3 Robustness analysis

To ensure the reliability of the conclusions, this paper conducts the following robustness tests: (1) The natural logarithm of the total number of patent applications + 1 is used as a surrogate variable for enterprise innovation; 2) Alleviate the endogeneity problem of the model by lagging the dependent variable by one year. The robustness is basically consistent with the conclusions of the main part of this paper.

6. Conclusion

Extant studies have mostly focused on the relationship between the internal pay dispersion of executives and enterprise innovation, but few studies have paid attention to the impact of the external pay dispersion of executives on enterprise innovation [3]. Besides, the research conclusions on how the external pay dispersion affects enterprise innovation have been controversial. At the same time,

the existing research has not paid attention to the influence of the interactive effect of the internal and external pay dispersion of executives on the innovation of enterprises. Using the data of Chinese listed companies, this paper studies the influence of the internal compensation of corporate executives, the external pay dispersion of executives, and the interaction effect of the internal and external pay dispersion of executives on the innovation of enterprises. The results show that: the internal pay dispersion of executives has a significant positive impact on the innovation of enterprises; the external pay dispersion of executives has a significant inhibitory effect on the innovation of enterprises; the external pay dispersion of executives further strengthens the internal pay dispersion of executives. Further, it is found that compared with non-state-owned enterprises, the internal pay dispersion of state-owned enterprises has a smaller role in promoting the innovation of the enterprise, and the external pay dispersion of executives has a smaller inhibitory effect on the innovation of the enterprise; Power enhances the positive effect of the internal executive pay dispersion on the innovation of the enterprise, and also strengthens the inhibitory effect of the external executive pay dispersion on the innovation of the enterprise.

The possible contributions of this paper are: (1) From the dual perspective of internal and external organizations, this paper clarifies the internal relationship between the internal and external pay dispersion of executives and corporate innovation. On the one hand, it supplements research conclusions of existing literature, responds to the controversy between "tournament theory" and "behavioral theory". On the other hand, it has made incremental contributions to the related research on the external pay dispersion of executives, which further enriches this research field. (2) This paper reveals the influence of the interactive effect of executive internal pay dispersion and external pay dispersion on enterprise innovation. This study found that there is a "transfer effect" between executives' binary pay dispersion, that is, the negative impact of executives' external pay dispersion on enterprise innovation can be compensated by the positive effect of internal pay dispersion. In the objective situation where the external promotion path is missing, the external pay gap and its incentive effect perceived by executives are transferred to internal tournaments. Therefore, this paper reveals the internal mechanism of the interaction between the internal and external binary pay gap on enterprise innovation from the dual perspectives of internal and external organizations. (3) This paper further explores the influence of corporate executive pay dispersion on the innovation performance of different companies in combination with the nature of property rights, executive power and other heterogeneous factors, and provides suggestions on how to reasonably set up compensation incentive mechanisms and governance mechanisms for different types of listed companies in China.

The theoretical analysis and empirical evidence of this paper offer the following policy implications. First, a reasonable pay dispersion should be designed within the enterprise to stimulate the enthusiasm of executives. Second, companies not only need to pay attention to the internal pay dispersion of executives, but also need to pay attention to the external pay dispersion of executives. Enterprises need to refer to companies in the industry to reasonably formulate executive compensation to avoid executive inaction and passive sabotage due to excessive pay dispersion. Third, this paper finds that executive power has different moderating effects on the influence of executives' internal pay dispersion, external pay dispersion and enterprise innovation. Enterprises need to give reasonable executives power according to the internal and external pay dispersion of company executives to improve enterprise innovation. Fourth, it is recommended that the government and industry organizations strengthen the construction of the manager market, improve the external promotion incentive path, and promote the external championship to play a competitive incentive effect. Fifth, the market-oriented reform of executive compensation of state-owned enterprises, improve the professional manager system of state-owned enterprises, and activate the incentive effect of internal and external tournaments with market-oriented salary incentives and market-oriented employment mechanisms.

This study also has the following shortcomings: First, different companies may have different definitions of executives, and some companies do not fully disclose executive compensation, which may lead to the inconsistency between the executive pay dispersion measured in this paper and other

literatures. Second, this paper defines enterprise innovation by the number of applications for invention patents. However, in reality, enterprises can not only conduct independent research and development, but also purchase and import patents. In the future, researchers are expected to study the impact of executive pay dispersion on independent research and development and patent introduction. Third, corporate innovation is not only related to executives, but also to core employees and R&D personnel. However, it is currently difficult to obtain salary data of core employees and R&D personnel in public databases. This can be studied when this part of data can be fully obtained in the future, the impact of the pay dispersion between personnel and other employees on enterprise innovation, so as to obtain empirical evidence for the rational design of core employees and R&D personnel compensation.

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