The Impact of Firm Pay Gap on The New Quality Productive Forces

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Abstract. This paper takes A-share listed companies in China's Shanghai and Shenzhen markets from 2011 to 2022 as a research sample to test whether the pay gap in listed companies will promote the development of new quality productive forces. The empirical research results show that the widening of the pay gap between executives and employees within listed companies can promote the improvement of new quality productive forces, and this effect is mainly achieved through three channels of reducing inefficient investment, reducing excess employment, and increasing innovation. At the same time, the paper also finds that both the concentration of executive pay and the level of financial flexibility of listed firms play a moderating role in this effect; specifically, the concentration of executive pay and the level of financial flexibility amplify the contribution of the pay gap to the new quality productive forces of listed companies. The results of this paper are robust after accounting for endogenous problems.

Keywords: pay gap; new quality productive forces; inefficient investment; excess employment; enterprise innovation.

1. Introduction

As a key link in the initial distribution, intra-enterprise salary distribution has a significant impact on the common prosperity and social equality and justice. The core of salary distribution in modern enterprises lies in the use of salary incentives to mobilize employees' enthusiasm by widening the pay gap within enterprises. At present, the intra-enterprise pay gap has been expanding, increasing by about 275.59% from 2008 to 2022 (Zhou et al., 2024) [1]. Academics are generally concerned about the economic consequences of the widening pay gap within enterprises, and the study of the impact of the pay gap in enterprises is of great significance to the formulation of the enterprise salary system, optimizing allocation of human resources and the optimization of corporate governance structure. However, few scholars have deeply explored the impact of the intra-enterprise pay gap on the new quality productive forces, which is important for the rationalization of the enterprise salary system, the improvement of the new quality productive forces of the enterprise and the sustainable development of the enterprise.

Based on this, this paper selects a sample of A-share listed companies in China's Shanghai and Shenzhen markets from 2011 to 2022 to test the impact of the intra-enterprise pay gap on the development of new quality productive forces, and finds that the expansion of the pay gap between executives and employees has a promotional effect on the enhancement of new quality productive forces of enterprises. This effect is mainly realized through three channels: reducing inefficient investment, reducing excess employment, and increasing innovation. This paper further reveals the moderating effect of executive pay concentration and financial flexibility of listed companies on the relationship between pay gap and new quality productive forces, and finds that executive pay concentration and financial flexibility expand the promotional effect of pay gap on new-quality productive forces within the firm. Meanwhile, in order to ensure the reliability of the research results, this paper fully considers the endogenous problems and conducts a robustness test.

According to the existing literature, internal corporate governance can be divided into the following levels: first of all, the management of the pay gap within the top executive team. Most of the existing research focuses on the relationship between the pay gap within the executives and corporate performance and discusses it from the tournament theory and comparison theory respectively. Lin et al. (2003) study the relationship between the pay gap within the executive team and corporate performance, and the results show that there is a significant positive relationship between the two [2]. Some scholars further examin the management of the pay gap within the enterprise, and research how to motivate the employees and improve the overall performance of the company through a reasonable salary design. Liu and Sun (2010) find that there is a significant positive relationship between the pay gap between executives and employees and corporate performance [3]. In addition, other scholars focus on the management of corporate executives, focusing on how to motivate executives to ensure that they create maximum value for the company. Some scholars argue that self-interested behavior of management will reduce or counteract the incentives provided by high salaries, thus the need to limit the growth of executive pay [4].

In summary, existing studies have made some progress, but there is still room for expansion. First, most of the literature focuses on management incentives, emphasizing the pay gap within the executive team and corporate performance. This paper, on the other hand, focuses on the pay gap between executives and employees and explores its relationship with firms' new quality productive forces; second, the research on the economic consequences of the intra-enterprise pay gap needs to be expanded. Existing research is limited to the corporate financial perspective, while this paper focuses on the sustainable development capability of the enterprise from the perspective of new quality productive forces; third, existing research lacks the path analysis of the impact of the pay gap on the economic consequences. This paper will reveal the mechanism of the impact of the pay gap on the new quality productive forces; finally, in the study of the new quality productive forces, scholars mainly theoretically explore its connotation, composition and influencing factors, and the existing literature lacks research from the perspective of enterprises. This paper will be from the level of the enterprise and deeply explore the impact of the intra-enterprise pay gap on the enterprise's new quality productive forces.

The possible marginal contributions of this paper are as follows: first, from the perspective of enterprises, this paper examines the impact of the pay gap on the development of new quality productive forces, which to some extent fills the gap in the literature and expands the research on the economic consequences of the pay gap within firms; second, this paper explores the potential mechanisms of the intra-enterprise pay gap affecting new quality productive forces, and finds that the intra-enterprise pay gap promotes the development of new quality productive forces through lowering inefficient investment, reducing excess employment, and improving innovation, which provides a theoretical basis for enterprises to enhance new quality productive forces through increasing the pay gap; third, this paper sets two moderating variables, executive pay concentration and financial flexibility, to study how they adjust the impact of intra-enterprise pay gap on new quality productive forces.

2. Literature Review

Economic consequences of the pay gap within enterprises. As a manifestation of organizational management and incentive mechanism, the pay gap within an enterprise may bring certain economic consequences. In this regard, there are two diametrically opposed views in the academic circle. One viewpoint supports the tournament theory, which holds that the intra-enterprise pay gap can have a positive incentive effect on employees and improve employees’ efforts, thus improving the efficiency and business performance of the enterprise. Liu and Sun (2010) consider the endogeneity between intra-enterprise pay gap and enterprise performance, and propose for the first time that the intra-enterprise pay gap in state-owned enterprises shows a significant positive correlation with enterprise performance, and the degree of incentives varies significantly between different regions and enterprises[3]; while Kong et al. (2017) examine the mechanism of the impact of the intra-enterprise pay gap on enterprise innovation, and conclude that the intra-enterprise pay gap has a positive impact on innovation performance, and the management pay premium is a key motivation for firms to incentivize innovation through the pay gap[5].

Although the above scholars believe that the intra-enterprise pay gap has a positive incentive effect, some scholars believe that too large a pay gap may cause a feeling of unfairness or exploitation, causing employees' dissatisfaction and making them pay more attention to competition instead of cooperation, which may result in the loss of the enterprises' interests. Li and Hu (2012) found that the intra-enterprise pay gap does not produce incentives for executives, and when the pay gap is small, it can produce incentives for employees, but when the pay gap is large, it does not produce positive incentives for employees[6], while Liu et al. (2017) studied the impact of the intra-enterprise pay gap on the production efficiency of state-owned enterprises and found that the widening of the pay gap in enterprises will hinder the improvement of production efficiency[7].

Some scholars combine the tournament theory with the comparison theory and propose that there is an inverted U-shaped relationship between the intra-enterprise pay gap and the business performance (Gao, M. and Lu, J., 2015) [8]; Hao (2016) continues to study on this basis and finds that the inflection point of the inverted U-shaped curve shifts to the right with the increase of market competition [9]. In addition, there are scholars who believe that earnings management is one of the economic consequences of the pay gap within the enterprise. Yang et al. (2019) find that the intra-enterprise pay gap will greatly reduce the earning management level, and the external monitoring mechanism as well as the managerial compensation mechanism plays an important role [10], while Yang and Wang find that the larger the intra-enterprise pay gap is, the higher the degree of earning management will be, and in the company with a concentrated ownership structure, this effect will be more significant [11].

Factors influencing the new quality productive forces. The new quality productive forces are the driving force for socio-economic development. Existing studies have explored the connotation, composition and influencing factors of the new quality productive forces. Some scholars propose that the new quality productive forces are the productivity in which scientific and technological innovation plays a leading role. The new quality productive forces can provide a driving force for production development through key and disruptive technologies (Zhou and Xu, 2023) [12]. Other scholars have also studied the composition of the new quality productive forces. Pu and Xiang (2024) argue that the new quality productive forces are composed of three factors: workers with "high quality", labor materials with "new media", and the object of labor [13]; while Huang et al. (2024) point out from the perspective of system theory that the new quality productive forces are interrelated and interacting systems composed of productivity factors, productivity structure and productivity functions [14].

New quality productive forces are affected by a variety of external factors. Currently, scholars have conducted research on the influencing factors of new quality productive forces from different perspectives. Based on the data of China's A-share listed companies from 2015-2022, Song et al. (2024) finds that ESG has a positive promoting effect on the firms' new-quality productive forces [15]; Ren et al. (2024) investigate the relationship between the financial cluster, industry-university-research cooperation and new quality productive forces. They find that the financial cluster promotes the development of new quality productive forces in each region, while industry-university-research cooperation plays a mediating role in this process [16]. In addition, data elements and the digital economy also have a positive impact on new quality productive forces. Shi and Sun (2024) find that data elements can promote the improvement of total factor productivity, which promotes the formation and development of new quality productive forces [17]. By constructing a three-dimensional analysis framework of "demand side-supply side-environment side", Zhang and Wen (2024) point out that the digital economy can improve the new quality productive forces through innovation of science and technology, the development of emerging industries, and conformity with the characteristics of the new quality productive forces [18]. In addition, artificial intelligence can also promote the development of new productive forces. Zhang and Tian (2024) find that artificial intelligence can promote new quality productive forces in strategic emerging industries [19].

3. Research Hypothesis

The pay gap can promote the development of new quality productive forces through three ways: reducing inefficient investment, reducing excess employment, and increasing innovation.

Due to the principal-agent problem and the lack of effective incentive mechanisms, according to the hypothesis of rational people, management may make decisions based on maximum personal interests rather than maximum corporate interests, which results in inefficient investment and harms the overall interests of the enterprise (Fang and Jin, 2013) [20]. Tournament theory suggests that the widening of the pay gap can effectively motivate executives, and when the pay gap can effectively make up for the personal interests obtained in the investment process, it can motivate executives to maximize the interests of the enterprise. Therefore, the pay gap can reduce the agency cost, align the interests of enterprise owners and executives, reduce the rent-seeking and myopia of executives, and reduce the inefficient investment behavior (Liu and Jiang, 2019) [21]. And in the case of a certain amount of funds, the increase of non-efficient investment will crowd out the funds for innovation investment, so the reduction of non-efficient investment can provide sufficient financial security for innovation investment (Gu and Zhu, 2021) [22], so the intra-enterprise pay gap can promote the improvement of the new quality productive forces centered on innovation by reducing non-efficient investment.

Secondly, the widening of the pay gap will make the high-paying jobs more attractive, thus increasing the competitive pressure among employees, and the employees who are difficult to cope with the pressure may choose to leave their jobs to look for other employment opportunities; at the same time, the enterprise usually adjusts the employees' pay according to the performance of their work, and the widening of the pay gap means that the importance of the performance appraisal is increased, and the employees who have poor performance may leave their jobs because of the low pay or slow growth rate. So, the widening of the pay gap within a firm reduces the excessive employment. Excess employees can increase the difficulties of corporate governance and bring adverse economic consequences. Niu and Wang (2022) argue that excess employees inhibit firms' innovation by increasing labor costs and agency costs and decreasing sensitivity of investment performance [23]. Reducing excess employees will allow more economic resources to be used for R&D investment or hiring innovative talent, thus promoting new quality productivity.

The widening of the pay gap can stimulate the competitive consciousness of employees, improve their work efficiency and innovation ability, create an atmosphere of innovation championship within the enterprise, and stimulate the enthusiasm of employees to participate in innovation activities. Liu (2019) argues that the internal pay gap of local state-owned enterprises as well as private enterprises will promote the innovation of enterprises [24]; Zhao and Wang (2019) find that the widening of the internal pay gap in the enterprise will motivate inventors to continuously innovate, and the increase in the number of patents will increase the probability that inventors will be promoted to the management team. After entering the management team, inventors can promote technological innovation in enterprises by increasing R&D investment and other ways [25]. The new quality productive forces are productive forces led by scientific and technological innovation to realize key and disruptive technological breakthroughs, so innovation is the core element of the new quality productive forces (Zhou and Xu, 2023) [12]. Improving the innovation ability helps the development of the new quality productive forces. To summarize, the pay gap within the enterprise can contribute to the improvement of new quality productive forces by improving the level of innovation.

Therefore, this paper proposes the following hypothesis:

H1: The widening of the pay gap within firms promotes new quality productive forces.

Compared with firms with a lower concentration of executive pay, firms with a higher concentration of executive pay, i.e., those with executives with higher confidence, are more likely to promote the development of new quality productive forces when the internal pay gap widens. On the one hand, more confident executives tend to have higher self-evaluations, and they believe in their ability to meet challenges in order to enhance their self-competence and promote corporate development. They are willing to implement innovative strategies. Wang et al. (2024) find that managers' self-confidence is positively correlated with the R&D investment in their firms [26], which means that executives with higher self-confidence are more likely to increase R&D investment and promote the development of new quality productive forces after being incentivized by the pay. On the other hand, innovation strategies are characterized by complexity, uncertainty, and lagging feedback mechanisms, which require managers to cope with risks and pressures with more confidence (Zhai and Bi, 2016) [27]. Yu et al. (2013) argues that executives with more confidence have higher self-evaluations and more optimistic expectations of the investment environment and that overconfidence can alleviate the principal-agent problem [28]. So, firms with more self-confident executives have greater risk-taking ability. Confident executives who are incentivized by compensation are more risk-taking and are more likely to make breakthroughs in the field of innovation, thus contributing to the development of new quality productive forces.

H2: The effect of the pay gap on new quality productive forces will be stronger in firms with higher concentration of executive pay compared to firms with lower concentration of executive pay.

The effect of the pay gap in promoting new quality productive forces is more significant in firms with higher financial flexibility. Financial flexibility is a systematic and comprehensive ability of enterprises to manage financial risks, integrate financial resources, and optimize financial decisions (Zhao and Zhang, 2010) [29]. On the one hand, due to the uncertainty of innovation activities, enterprises have stronger uncertainty avoidance for innovation investment. But enterprises with higher financial flexibility can cope with the uncertainty risk caused by financial fluctuations by allocating funds in time. They can seize the opportunity of investment to maintain the stability of innovation investment (Pan and Wang, 2020) [30]. Therefore, compared with firms with lower financial flexibility, firms with higher financial flexibility have a strong ability to cope with the risks brought by the widening of the pay gap and are able to maintain the stability of innovation, which in turn promotes the improvement of the new quality productive forces. On the other hand, according to comparative theories, the widening of the pay gap within the enterprise will make employees feel a sense of inequality or a sense of being exploited, whereas the enterprise with higher financial flexibility has sufficient funds to cope with potential problems and uncertainties, and protects the rights and interests of all employees. This can alleviate employees' dissatisfaction and make them maintain optimistic expectations for the future and actively participate in R&D activities. Therefore, enterprises with higher financial flexibility can create a stable innovation environment and promote the growth of new quality productive forces.

H3: The effect of the pay gap on new quality productive forces will be stronger in firms with higher financial flexibility compared to firms with lower financial flexibility.

4. Research Design

Data Sources. This paper adopts all A-share listed companies in the Shanghai and Shenzhen markets from 2011 to 2022 as the research sample, and the financial data and governance data of the companies are from the China Stock Market & Accounting Research Database (CSMAR). In addition, this paper refers to previous literature and treats the sample according to the following principles: ① Excluding ST and PT listed companies. ② Winsorize all continuous variables at the 1st and 99th percentiles. ③ Exclude samples with missing values for the explanatory variables, explained variables, and control variables. After a series of treatments, the paper ends up with 31,192 samples.

Definition of Variables. Explanatory variable.The pay gap (WGap) is used as an explanatory variable. There are generally two ways of measuring pay gap, namely absolute pay gap and relative pay gap, and benchmark regression adopts absolute pay gap as the main explanatory variable. The absolute pay gap is measured as the natural logarithm of the difference between the executive pay per capita and the employee pay per capita (excluding executives). This variable can reflect the absolute gap between executive pay and employee pay.

Explained variable. Referring to the measurement method of Song et al. (2024) [15], this paper takes the new quality productive forces as an explained variable, labeled as Npro. The core of the new quality productive forces is innovation, so this paper adopts the entropy method to measure the new quality productive forces. According to Song et al., the new quality productive forces can be divided into two aspects: labor force and production tools, which include four sub-factors: living labor, materialized labor, hard technology, and soft technology. This variable can fully reflect the new quality productive forces brought by the development of innovation. The higher the value of this variable, the better the development of new quality productive forces.

Moderating variables. This paper sets two moderating variables, executive pay concentration (Conf3) and financial flexibility (FF). First, executive pay concentration is measured by the ratio of the first executive's pay to the sum of the top three executives's pay. The higher the value of this variable, the higher the executive pay concentration. The executive pay concentration can reflect the degree of overconfidence of the executive group to some extent. Second, referring to the measurement method of Zeng et al. (2011) [31], the degree of financial flexibility is the sum of cash flexibility and debt financing flexibility. Cash flexibility is the difference between the cash ratio of the enterprise and the average cash ratio of the industry, and debt financing flexibility is the difference between the average debt ratio of the industry and the debt ratio of the enterprise, and if the debt financing flexibility is less than 0, it takes the value of 0.

Control variables. In order to ensure that the regression results in this paper can demonstrate the explanatory power of the main explanatory variable, this paper controls for the following common firm-level variables with reference to previous literature: return on assets, growth, enterprise age, enterprise size, and asset-liability ratio.

Table 1 Definition of Variables

Variables	symbol	Definition
New quality productive forces	Npro	Refer to Song Jia et al. (2024)
Pay gap	WGap	Ln (Executive pay per capita-employee pay per capita)
Executive pay concentration	Conf3	Pay of top executive / sum of top three executives
Financial flexibility	FF	Refer to Zeng Aimin, et al. (2011)
Enterprise size	Size	Ln (1 + total assets)
Growth	Growth	Annualized growth rate of main business income
Return on assets	ROA	Net profit / total assets
Enterprise age	Age	Ln (1 + enterprise age)
Asset-liability ratio	Lev	Total liabilities / total assets

Model design. In this paper, model (1) and model (2) are used to test the hypotheses. The left side of the equation is Npro indicating the firm's new quality productive forces, while the variable WGap on the right side of the equation refers to the pay gap within the firm. X is a vector indicating the set of control variables. Year F.E. And Company F.E. indicate that the model controls for the year effect and the firm effect. In addition, since this paper uses panel data, it applies cluster-robust standard error treatment to all variables. We focus on the coefficient of the variable WGap, and if the coefficient of the variable WGap on the right side of the equation is significantly positive, it indicates that the pay gap promotes the development of new quality productive forces, which supports H1.

$$Npro = \alpha + \beta * WGap + \gamma X + Year\ F.E. + Company\ F.E. + \varepsilon \tag{1}$$

This paper adopts model (2) to test H2 and H3. Compared with model (1), model (2) adds the moderating variable (Moderator) and the cross-multiplier term (Interact) on the right side of the equation. The moderating variable Moderator can refer to the concentration of executive pay (Conf3) and also financial flexibility (FF). We focus on the the coefficients of the interaction term on the right side of the equation, if the coefficients of the interaction term are significantly positive, it means that H2 and H3 are valid.

$$Npro = \alpha + \beta * WGap + \sigma Moderator + \tau Interact + \gamma X + Year\ F.E. + Company\ F.E. + \varepsilon \tag{2}$$

5. Empirical Findings

Descriptive statistics. The descriptive statistics for this paper are shown below

Table 2 Descriptive Statistics

Variables	Mean	Standard Deviation	Minimum	Median	Maximum
Npro	5.2052	2.522	0.73	4.86	14.87
WGap	13.2113	0.686	11.51	13.20	15.11
Conf3	0.4132	0.075	0.33	0.39	0.72
FF	0.0741	0.203	-0.22	0.02	0.72
Lev	0.4239	0.205	0.06	0.41	0.91
Size	22.2666	1.306	19.88	22.07	26.35
Growth	1.1617	0.411	0.43	1.10	3.59
Age	2.9500	0.312	1.95	3.00	3.56
ROA	0.0351	0.065	-0.27	0.04	0.20

Benchmark regression. This paper uses model (1) to conduct the initial test of H1, and the regression results are shown in Table 3. In columns (1) and (2) of Table 3, there is no difference in the regression results between the inclusion of control variables and the absence of control variables, indicating that the positive effect of pay gap on new quality productive forces has strong explanatory power. The regression coefficients of WGap are all significantly positive at the 5% statistical level, suggesting that the pay gap has a facilitating effect on newquality productive forces. In addition, this paper finds that larger, older, and smaller ROA firms are more likely to develop new quality productive forces. The above results can robustly support H1 proposed in this paper.

Table 3 The Result of Benchmark Regression

	(1)	(2)
Variables	Npro	Npro
WGap	0.0689**	0.0796***
	(0.0272)	(0.0278)
Lev		0.0354
		(0.110)
Size		0.127***
		(0.0293)
Age		1.603***
		(0.181)
Growth		0.0821***
		(0.0274)
ROA		-2.308***
		(0.192)
Constant	Yes	Yes
Year F.E.	Yes	Yes
Company F.E.	Yes	Yes
R square	0.7692	0.7775
Obs	31,192	31,192

Moderating effects test. In this section, the paper sets moderating variables to further explore the benchmark regression results. Using model (2), this paper first uses the concentration of executive pay (Conf3) as the moderating variable, and the regression results are shown in column (1) of Table 4. The regression coefficient of the variable WGap*Conf3 is significantly positive at the 5% statistical level, indicating that the concentration of executive pay enhances the impact of intra-enterprise pay gap on new quality productive forces. Next, this paper uses financial flexibility FF as the moderating variable to test hypothesis 3, and the regression results are shown in column (2) of Table 4. The regression coefficient of the variable WGap*FF is significantly positive at the 1% statistical level, which supports H3 proposed in this paper. When the pay gap widens, the firms with better financial flexibility captures more new-quality productive forces.

Table 4 Moderating Effects Test

	(1)	(2)
Variables	Npro	Npro
WGap	0.0719**	0.0858***
	(0.0279)	(0.0274)
Conf3	-0.290*	
	(0.150)	
WGap*Conf3	0.370**	
	(0.185)	
FF		-2.300***
		(0.0914)
WGap*FF		0.304***
		(0.0969)
Lev	0.0361	-1.531***
	(0.110)	(0.125)
Size	0.127***	0.125***
	(0.0293)	(0.0289)
Age	1.623***	1.299***
	(0.181)	(0.175)
Growth	0.0831***	0.0712***
	(0.0274)	(0.0270)
ROA	-2.302***	-2.116***
	(0.192)	(0.188)
Constant	Yes	Yes
Year F.E.	Yes	Yes
Company F.E.	Yes	Yes
R square	0.1453	0.1603
Obs	31,192	31,192

6. Mechanism Test.

This paper adopts inefficient investment (Inv), excess employees (OE), and enterprise innovation (RD) as mediating variables, and uses a three-step method to test the mediating effect. The test method is as follows: 1) First, without mediating variables, model (1) is used to test hypothesis 1. Where the regression coefficient of the main explanatory variable WGap needs to be significant and the coefficient sign is correct. Since model (1) is given above, it will not be repeated here. 2) Use the same control variables. Mediating variable was adopted as the explained variable, and WGap was used for regression based on model (3) where the regression coefficients of WGap need to be significant and of the correct sign. 3) Add the mediator variable to the right side of the equation in model (1) to generate model (4), where the mediator variable still needs to remain significant in the regression results.

$$Mediator = \alpha + \beta * WGap + \gamma X + Year\ F.E. + Company\ F.E. + \varepsilon \tag{3}$$

$$Npro = \alpha + \beta * WGap + \sigma * Mediator + \gamma X + Year\ F.E. + Company\ F.E. + \varepsilon \tag{4}$$

For the measurement of mediating variables, there are three mediating variables in this paper. The first is inefficient investment, which refers to the measurement of Richardson (2006) [32]. The higher the value of this variable, the higher the inefficient investment. The second is excessive employment. The variable refers to the measure of Hu Ning and Jin Qinglu (2019) [33]. The higher values of the variable indicate more severe excessive employment. The third is enterprise innovation, which is measured by the ratio of the firm's annual R&D expenditures to business income, and a higher value of this variable indicates a higher level of innovation.

The first step has been given in the previous table and will not be repeated here. The regression results for the second step are shown in columns (1) and (3) and (5) of Table 5. The regression coefficients for the mediating variables Inv, OE, and RD are all significant at the 1% statistical level. The regression results of the third step are shown in columns (2) and (4) and (6) of Table 5. The regression coefficients of the mediating variables Inv, OE, and RD are significantly positive, which meets the coefficient criterion required in the third step above, and proves that the intra-enterprise pay gap is able to contribute to the development of new quality productive forces through the reduction of inefficient investment, the reduction of excessive employment, and the increase in the level of innovation.

Table 5 Mechanism Test

Stage	Stage II	Stage III	Stage II	Stage III	Stage II	Stage III
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Inv	Npro	OE	Npro	RD	Npro
WGap	-0.00327***	0.0505*	-0.0468***	0.0710**	0.00324***	0.0417
	(0.000974)	(0.0285)	(0.0156)	(0.0277)	(0.000447)	(0.0273)
Inv		-1.026***				
		(0.221)				
OE				-0.185***		
				(0.0252)		
RD						11.71***
						(0.579)
Lev	0.0128***	-0.0346	-0.0344	0.0291	-0.0248***	0.326***
	(0.00423)	(0.117)	(0.0620)	(0.111)	(0.00185)	(0.109)
Size	0.00145	0.0864***	-0.209***	0.0887***	0.00224***	0.101***
	(0.00104)	(0.0311)	(0.0169)	(0.0303)	(0.000463)	(0.0286)
Age	-0.0298***	1.556***	-0.119	1.581***	-0.0163***	1.794***
	(0.00625)	(0.193)	(0.0934)	(0.180)	(0.00312)	(0.179)
Growth	0.0140***	0.0967***	-0.224***	0.0405	-0.00553***	0.147***
	(0.00125)	(0.0284)	(0.0174)	(0.0279)	(0.000433)	(0.0273)
ROA	0.0654***	-2.128***	-1.191***	-2.529***	-0.0741***	-1.441***
	(0.00759)	(0.193)	(0.115)	(0.194)	(0.00426)	(0.192)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Company F.E.	Yes	Yes	Yes	Yes	Yes	Yes
R square	0.2133	0.1493	0.7207	0.7711	0.8436	0.7775
Obs	27,579	27,579	31,192	31,192	31,192	31,192

7. Robustness Test

Adding control variables. We first conduct a robustness test by adding control variables. Considering that both the explanatory variables and the explanatory variables are firm-level variables, I add the director board size (Board), the level of cash flow (Cash), and capital expenditures (Cap), as these control variables also affects the firm's pay gap to some extent. The regression results are shown in column (1) of Table 6, which proves the basic conclusions of the paper to be correct after adding more control variables.

Instrumental variables approach. There may be endogenous problems in this paper, for example, the pay gap may be larger in firms with higher new quality productive forces. Therefore, this paper adopts the instrumental variable method to eliminate the influence of endogeneity. In this paper, the pay gap with a lag of one period is selected as the instrumental variable, which does not have a direct effect on new quality productive forces, but affects new quality productive forces by influencing the pay gap in the current period. This instrumental variable passes the weak instrumental variable test. The regression results are shown in column (3) of Table 6. After accounting for endogenous problems, the regression results of this paper are error-free.

Increasing fixed effects. There may be differences between industries in corporate pay gaps and new quality productive forces. For example, Traditional industries are more likely to promote new quality productivity than emerging industries, so in order to keep the regression results of this paper from being affected by industry differences, this paper adds industry fixed effects to the regression, and the regression results are shown in column (2) of Table 6. After controlling for industry fixed effects, the regression coefficient of the main explanatory variable WGap is still significantly positive, supporting the findings of this paper.

Table 6 Robustness Test

	(1)	(2)	(3)
Variables	Npro	Npro	Npro
WGap	0.148***	0.0796***	0.355***
	(0.0246)	(0.0278)	(0.0295)
Lev	-0.610***	0.0354	-0.709***
	(0.0979)	(0.110)	(0.0878)
Size	0.280***	0.127***	0.157***
	(0.0260)	(0.0293)	(0.0145)
Age	1.221***	1.603***	-0.385***
	(0.157)	(0.181)	(0.0516)
Growth	0.0957***	0.0821***	0.209***
	(0.0251)	(0.0274)	(0.0345)
ROA	-1.042***	-2.308***	-2.244***
	(0.164)	(0.192)	(0.239)
Board	-0.111		
	(0.0830)		
Cash	-1.497***		
	(0.107)		
Cap	7.849***		
	(0.147)		
Constant	Yes	Yes	Yes
Company F.E.	Yes	Yes	No
Year F.E.	Yes	Yes	Yes
Industry F.E,	No	Yes	No
R square	0.7860	0.7691	0.7691
F value			195.38
Underidentification			Pass
Weakidentification			Pass
Obs	29,865	31,192	27,316

8. Summary

Against the background of the widening of the pay gap within enterprises, society is generally concerned about the economic consequences of the widening of the pay gap. Enterprises, as the important main body of the development of new quality productive forces, the management of the pay gap within enterprises is an important part of the development of new quality productive forces. Therefore, this paper takes A-share listed companies in China's Shanghai and Shenzhen markets from 2011 to 2022 as the research samples and studies the impact of the internal enterprise pay gap on new quality productivity. The findings show that the expansion of the intra-enterprise pay gap promotes the development of new quality productive forces, and the analysis of the potential mechanism indicates that the intra-enterprise pay gap promotes the development of new quality productive forces mainly through the reduction of inefficient investment, the reduction of excess employment, and the improvement of enterprise innovation. Further research shows that the pay gap of firms with higher executive pay concentration promotes new quality productive forces more than firms with lower executive pay concentration, and the pay gap of firms with higher financial flexibility promotes new quality productive forces more than firms with lower financial flexibility. In addition, this paper conducts a series of robustness tests to prove that the basic conclusions of this paper are correct.

Combined with the conclusions of this paper, the following policy suggestions are put forward: Firstly, the intra-enterprise pay gap should be rationally regulated. Enterprises should carry out intra-enterprise salary distribution according to the actual situation and appropriately expand the intra-enterprise pay gap in order to improve the enthusiasm and innovation of employees and promote the development of new quality productive forces. At the same time, it is necessary to avoid the increase of employee dissatisfaction and social instability due to the excessive internal pay gap. Second, strengthen the performance evaluation. Based on the findings of this paper, it is known that the intra-enterprise pay gap in enterprises mainly promotes the development of new quality productive forces by reducing inefficient investment, reducing excess employees, and improving enterprise innovation. Therefore, in practice, enterprises should build a well-established performance evaluation system, and indicators such as rate of return and labor productivity should be incorporated into the performance evaluation system, so as to reduce the inefficient investment and excess employees, and improve the innovation ability and operational efficiency of enterprises. Thirdly, optimize the salary structure of executives. For enterprises with low executive pay concentration, they can promote the development of new quality productive forces by optimizing the salary structure and increasing the executive pay concentration. Fourth, enterprises should establish a scientific financial flexibility reserve system, implement flexible budget management and financial planning, and reasonably allocate resources to cope with uncertainties. In this way, the intra-enterprise pay gap plays a more stable and effective role in promoting new quality productive forces.

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