Internal Compensation Gap and the Sustainable Development Ability of Manufacturing Enterprises

—Based on the Moderator Variable of ESOP

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Abstract

The article uses A-share to list manufacturing companies from 2015 to 2019 as a sample to examine the impact of the internal salary gap between executives and employees on the company's sustainable development capabilities. The study found that there is an inverted U relationship between manufacturing executive and employee salary gap ratio and employee productivity and sustainable growth rate; ESOP can reduce the inhibition of excessive internal compensation on employee productivity; the detailed study found that ESOP design motivation can only improve from the employee perspective, such as low employee contribution ratio and wide employee participation range, excluding related industries. The article expands the scope of research of the internal compensation on the sustainable development ability of the manufacturing enterprises and the adjustment effect of the ESOP, thus providing reference value for the manufacturing enterprises to design and implement the ESOP.

Keywords

Internal Compensation Gap, Sustainable Development Ability, ESOP

1. Introduction

With the process of reform and opening up, many industries in China have absorbed foreign manufacturing skills and organizational governance knowledge to varying degrees. But there are also many problems, such as internal control problems. As a result, many companies began to use Western incentives to align executives' interests with the owners of the company, with a result of rising ex-

ecutive salaries and widening internal pay gaps. In the context of Confucian culture emphasizing the idea of "equality" (Chen et al., 2020), and our country's social system highlighting common prosperity, the "Sky-high salaries" of corporate executives will always arouse public attention and discussion.

General Secretary Xi Jinping's investigation in Northeast China in September 2018 pointed out that "high-quality development of manufacturing is the top priority of high-quality development of China's economy," the importance of the sustainable development ability of manufacturing enterprises has been highlighted. The connotation of enterprise sustainable development ability is mainly reflected in sustainability, growth and innovation (Guo, 2006). For micro enterprises, sustainability and growth are mainly restricted by the operating level, financial resources and relevant policies of enterprises. The sustainable growth rate comprehensively reflects the highest sales growth rate that enterprises should achieve under the existing resources. Innovation can maintain the competitive advantage, and is an important factor to promote the sustainable development of enterprises (Bone & Saxon, 2000). According to Peter Xiong's innovation theory, innovation includes institutional innovation and technological innovation. In the current China's economic market, the organizational system of enterprises has basically taken shape. The innovation of the enterprise is essentially the technological innovation, and the technological innovation ultimately comes from the creativity and innovation of the enterprise. Intuitively, employees seem to have little connection to enterprise innovation, such as low level and influence, unable to make innovation decisions and allocate innovative resources; innovation activities have high requirements on technical level, while most employees are mostly engaged in routine and repetitive work with low technical content (Meng, Li, & Zhang, 2019). In fact, enterprise innovation is a complex multi-stage process, each stage is labor-intensive, and urgently the joint efforts of employees at all levels and departments are needed (Holmstrom, 1989). According to the innovation process, employees have contributed important driving forces in the formation of innovation ideas, innovation decision implementation, innovation information feedback, innovation backup support and other links (Meng, Li, & Zhang, 2019; Bradley, Kim, & Tian, 2017; Lu & Dang, 2014; Chen, 2017; He & Tian, 2018; Kong, Xu, & Kong, 2017). Therefore, different from the inherent impression, employees' role is indispensable in enterprise innovation, and different from the "decision maker" identity of management, mainly plays the role of "executor" (Meng, Li, & Zhang, 2019). At the present stage, China's manufacturing industry is still a labor-intensive industry, and the implementation degree of employees is the key factor to ensure the innovation of manufacturing enterprises, whose direct performance is the production efficiency of employees. It is the bias in the role of employees in innovation activities that people generally attribute corporate innovation to the correct leadership of management, but turn a blind eye to their contributions (Meng, Li, & Zhang, 2019). This awareness directly leads to excessive executive compensation and gradually wi-

dening internal compensation gap. According to the "championship" or "social fairness" theory, the internal salary gap will have the completely opposite effect on the enthusiasm and execution of the employees, which will then affect the sustainable development ability of the enterprise. Based on this, this paper selects the manufacturing enterprises listed in 2015-2019 as the sample data to measure the sustainable development capacity with sustainable growth rate and employee productivity efficiency, and examines the impact of the internal salary gap between executives and employees on the sustainable development capacity of manufacturing enterprises.

China's employee stock ownership plan (ESOP) has always been the focus of academia and practice circles. It started in the 1980s and was suspended at the end of the 1990s. In 2013, the ESOP was proposed again at the Third Plenary Session of the Eighteenth Central Committee of the Party. In 2014, the China Securities Regulatory Commission also issued relevant documents. Different from previous literature research, this paper intends to explore the regulatory effect of ESOP in the internal compensation gap between executives and employee efficiency from the original intention of designing ESOP.[1]

The main contribution of this article is: First, we enrich the relevant literature on the internal salary gap among executive employees. Previous scholars have mainly studied the impact of internal salary gap on enterprise performance (Liu & Sun, 2010), Enterprise value (Liang, Zhang, & Wang, 2019), Enterprise innovation (Xie, 2017). Only a few scholars study the impact of internal compensation gap on sustainable growth capacity and employee productivity (Li & Chen, 2016; Li & Hu, 2012; Lei & Guo, 2017; Wen, Zeng, & Chen, 2020). Unlike previous studies, this paper reveals the impact of the executive-employee internal compensation gap on sustainable growth rate and employee productivity during a special period of "bottleneck" in technological innovation in manufacturing enterprises. Second, in the transformation of, large manufacturing country to manufacturing power the sustainable development capacity of manufacturing is more noteworthy than other industries; With the proportion and position of private enterprises in the economic development of China, it is important to the sustainable and stable growth and high-quality development of private economy. Compared to previous literature studies (Li & Chen, 2016), this paper conducts a research on sustainable development ability with the data in 2015 to 2019, so as to supplement the lack of research on the topic and expand the research scope of the topic. Third, previous scholars have mainly studied the incentive effects of ESOP (Wang, Dai, & Kong, 2017; Chen, Ou, & Huang, 2019), design motivation (Sun, Zhang, & Zhou, 2017; Chen, Lyu, Huang, & Ding, 2020), and economic consequences (Meng, Li, & Zhang, 2019; Zhou, Huang, & Zhao, 2019) etc. From the original idea of designing ESOP, namely the two-factor theory, this paper explores the adjustment effect of ESOP in the influence of executive-employee

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[1]Two-factor theory: capital and labor are the two key elements of wealth creation, but the industrialization process makes the distribution of wealth far higher than labor, which leads to a serious gap between the rich and the poor.

internal salary gap on employee production efficiency, and thus expands the research scope of ESOP and examines whether the motivation of Chinese enterprise design and implementation of ESOP is consistent with its original intention.

The remaining parts of this paper are arranged as follows: The second part reviews the literature related to internal pay gap, sustainable development of manufacturing enterprises and employee stock ownership plan, and puts forward relevant research assumptions; The third part is empirical research design and data description. The fourth part is the basic empirical analysis results of the internal pay gap and the sustainable development ability of manufacturing enterprises and the empirical analysis results of the moderating effect of ESOP on the relationship between the two. The fifth part tests the robustness of the relationship between the internal salary gap and the sustainable development ability of manufacturing enterprises. Finally, the research conclusion and significance.

2. Literature Review and Research Assumptions

There are generally two competitive views and research conclusions on the impact of internal salary gap on enterprises. One is the championship theory, analyzing the incentive effect formed due to the compensation gap from the perspective of competition; the other is the social comparison theory, analyzing the psychological guidance of employee behavior formed by the compensation gap from the perspective of fair feeling, thus producing a positive or negative effect (Bradley, Kim, & Tian, 2017; Li & Chen, 2016).

According to the "bidding competition theory", the promotion of employees within the enterprise is similar to the form of the championship. The relevant salary distribution results within the enterprise are regarded as the bonus of the "championship" to obtain the corresponding results, so that employees have promotion channels, and then can stimulate employees to actively participate in the work. The actual economic consequences and incentive effects of the theory have been tested in previous literature, such as the internal compensation gap promoting the advancement of enterprise performance and innovation (Kong, Xu, & Kong, 2017; Liu, Tian, & Zhang, 2017). Internal compensation gap reduces the surplus management level (Yang, Xu, & Kong, 2019). Internal salary gap enhances the competitiveness of enterprises (Sheng, Guo, & Zhang, 2017). The explanation of the negative impact of the internal pay gap on businesses comes mainly from the fair theory raised by Adams (1965) and relative exploitation theory raised by Festinger (1954). Previous scholars have carried out research on enterprises based on these two theories and Chinese actual background, such as internal executive level salary gap and enterprise non-efficiency investment (Wu & Bu, 2020), internal salary gap between senior executives and corporate risk assumption (Liu, Zhang, & Li, 2018), and have discovered the negative effect of the internal compensation gap on enterprises. In addition, because the current performance indicators of the enterprise are easy to be manipulated by the management, and the production efficiency is measured by the enterprise non-profit

indicators, which is difficult to be manipulated. Therefore, scholars gradually explore the impact of internal compensation on production efficiency. The executive compensation gap can effectively promote the sustained growth of total factor productivity in Chinese state-owned enterprises (Gao & Lu, 2015; Sheng, Zhang, & Jiang, 2019). When the larger the enterprise internal compensation gap increases, the higher the enterprise total factor productivity, and this positive relationship is only significant in the sample of the lower compensation gap (Li & Hu, 2012). However, the study found that the internal compensation gap suppressed labor productivity in tourism enterprises (Wen, Zeng, & Chen, 2020); The internal salary gap in the conference led to reduced production efficiency (Miao, Hu, & Fu, 2016); In the manufacturing industry, the expansion of the internal compensation gap between state-owned enterprises is not conducive to improving production efficiency. Its negative effect on the production efficiency of central state-owned enterprises is greater than that for local state-owned enterprises (Liu, Tian, & Zhang, 2017). It can be seen that China's salary gap cannot be explained by the championship theory or social comparison theory. When the compensation gap is small, the championship theory may be established, and when the compensation gap is too large, the social comparison theory can better explain the real situation (Xie, 2017). The study found that the U relationship between internal compensation gap and total factor productivity (Yang & Lu, 2018). From the review of the above literature, it can be seen that most of the previous literatures focus on the impact of short-term financial indicators or management innovation on enterprises' sustainable development ability. On the one hand, the accuracy and sustainability of the current financial index data are not considered. On the other hand, the role of employees as the cornerstone of an enterprise on its innovation is not considered. On this basis, this paper carries out the following analysis and exploration.

In his congratulatory letter to the 2019 World Manufacturing Congress, General Secretary Xi Jinping noted that "China attaches great importance to the development of manufacturing industry and takes high-quality development of manufacturing as an important part in building a modern economic system"; the Fifth Plenary Session of the 19th CPC Central Committee will focus on the real economy, unswervingly build manufacturing power, quality power and core competitiveness, and enhance the importance of sustainable development capacity of manufacturing industry. Based on the above analysis, the sustainable development ability of the manufacturing industry comes from the enterprise financial resources and innovation performance. The current performance of the enterprise often includes the performance growth created by senior executives through short-term behavior and the performance abnormalities formed by various financial factors, and perhaps the enterprise itself does not have the ability to maintain this growth momentum for the long term (Li & Chen, 2016), so we learn the method of Liu et al. (2002), and construct the sustainable growth rate index of the company according to the Van Horn sustainable development static

model to measure the financial resources of the company's sustainable development ability. As a labor-intensive industry, the efficiency of employees in forming innovative ideas and implementation feedback is becoming more and more important in innovation performance. The faster the employee production efficiency, more experimental opportunities and time for enterprise innovation, which then help enterprises break through the "bottleneck" of technological innovation, so we learn the method from Li Wenjing and Hu Yuming (2012), and use the total factor production model builds employee productivity indicators to measure the innovative performance of enterprise sustainable development ability according to Lu Xiaodong and Lian Yujun (2012). To sum up, it is more practical to study the impact of the executive-employee compensation gap on sustainable development capacity. Based on the above analysis, the following assumptions are presented.

H1a: In manufacturing enterprises, there is an inverted U relationship between executive and employee internal salary gap and employee production efficiency.

H1b: In manufacturing enterprises, there is an inverted U relationship between the internal salary gap between executives and employees and the sustained growth rate.

After the ups and downs in China, ESOP is still deeply loved by many enterprises. The main reason is that ESOP turns employees and enterprises into a whole, which makes employees have a sense of belonging. According to human resources theory, human capital plays a key role in the future economic development of society. In order to retain talents, enterprises have to implement the corresponding employee incentive plan, so that employees have a sense of belonging and eliminate the sense of unfair treatment. Among them, ESOP can quickly mobilize and play the enthusiasm of employees, improve their comprehensive quality and professional skills, so as to accumulate more human capital for the enterprise, which is conducive to the long-term development of the enterprise (Song & Liu, 2018). According to the theory of principal-agent theory, ESOP, as an incentive mechanism, can raise employees to the level of shareholders, enhance their status, meet their self-esteem and self-confidence, which is conducive to enhance employees' sense of ownership and reduce their possible moral risks. The result is to strengthen their work and performance assessment, which encourages them to work hard and prevent negative neglect and inefficiency (Song & Liu, 2018). In addition, relevant foreign research has found that the implementation of ESOP can improve the ability and operation of the enterprise, mainly due to the implementation of ESOP, employees can only be passive workers, equal limited efforts; after the implementation of ESOP, employees become some owners, can participate in the sharing of business performance sharing, they will pay more attention to the long-term development of the enterprise and actively participate in manufacturing (Rosen & Quarrey, 1987; Kramer, 2010; Kim & Ouimet, 2014). Based on the above analysis, the ESOP makes employees

have psychological ownership and reduce the internal salary gap within the enterprise, which makes employees a more active and efficient investment, with the result of improved productivity. In conclusion, the following hypotheses are presented.

H2: Under the implementation of ESOP, the negative impact of excessive internal compensation gap on employee productivity decreased.

3. Research and Design

3.1. Sample Selection and Data Sources

The financial data are all from the CSMAR database, among which the initial sample scope is the manufacturing listed company that issued A-shares on the main board of Shanghai and Shenzhen in 2015 to 2019. The data collection deadline is 2019, mainly due to the impact of the global COVID-19 outbreak in 2020 on the financial data of listed companies. Choosing 2015 as the starting point is mainly to ensure the symmetry of ESOP data. Further screening: 1) excluded the observations with negative net assets; 2) eliminated the observations with the average executive compensation below the average employee; 3) excluded the observations with missing data. With the above treatment, 5260 companies finally got an annual sample. To eliminate the effect of extreme values, this paper addresses the 1% and 99% percentiles of continuous variables.

The data related to the ESOP are from the flush database, deleted the sample companies that failed or stopped the implementation progress at the general meeting of the ESOP; manually eliminated the sample companies in the same year, retained only the first ESOP, and finally obtained 328 sample companies.

3.2. Design of Explanatory Variables

Measure of the internal pay gap between executives and employees

Average salary for the average employee (1)

$$= \frac{\text{Cash paid to and for the employees} - \text{Total high salary of directors and supervisors}}{\text{Number of employees} - \text{Number of directors and supervisors receiving compensation}}$$

Just as Liu Chun and Sun Liang (2010) pointed out, this article also uses the total net salary of employees after excluding the basic social security expenses of endowment insurance money to calculate the internal salary difference of the enterprise.

Average salary for the average employee (2)

$$= \frac{\text{Cash paid to and for the employees}/1.56 - \text{Total high salary of directors and supervisors}}{\text{Number of employees} - \text{Number of directors and supervisors receiving compensation}}$$

Like Li Ping and Chen Xinmin (2016), similarly, it is pointed out that to stimulate long-term efficiency of executives, many SOEs issue rights issues to executives through stock options, and dividend acquisition is part of executive revenue, but not included in executive cash compensation. The purpose of this paper is to explore the impact of the salary gap between senior executives and

employees on the long-term development of enterprises, so the income from executive shareholding is included in the annual salary of senior executives.

$$\text{Executive average salary}$$

$$= \frac{\text{Total top three executive compensation}}{3}$$

$$+ \frac{\text{Number of executives holding}}{\text{The number of executives}} * \text{Cash dividend per share}$$

$$\text{IPG1} = \frac{\text{Executive average salary}}{\text{Average salary for the average employee}} \quad (1)$$

$$\text{IPG2} = \frac{\text{Executive average salary}}{\text{Average salary for the average employee}} \quad (2)$$

3.3. Design of the Explanatory Variables

3.3.1. Total-Factor Productivity

Li Wenjing and Hu Yuming (2012) pointed out that the enterprise total factor productivity (TFP) can somehow reflect the productivity of employees, although the influence of executives cannot be excluded completely without noise, but based on the explanation of the article, the best measure of total factor productivity, this article also uses total factor productivity to measure total factor productivity. This article draws from Lu Xiaodong and Lian Yujun (2012), and uses OP method to obtain the total factor productivity of enterprises. In order to ensure the reliability of the research conclusions of this paper, in the robustness test part, this paper draws on LP method used to estimate TFP from the research design of Lu Xiaodong and Lian Yujun (2012) and adopts the total factor productivity calculated by the OLS method by industry and by year regression according to Li Wenjing and Hu Yuming (2012).

1) The OP method

Referring to Olley and Pakes (1996), this paper learns from Lu Xiaodong and Lian Yujun (2012) and uses the measurement method of TFP to estimate the total factor productivity level of the enterprise. The Model (1) is as follows:

$$\begin{aligned} \text{LnY}_{i,t} = g_0 + g_1\text{LnK}_{i,t} + g_2\text{LnL}_{i,t} + g_3\text{LnMat}_{i,t} + g_4\text{Age}_{i,t} + g_5\text{State}_{i,t} \\ + \text{Year} + \text{Industry} + \gamma_{i,t} \end{aligned} \quad (1)$$

Among them, Y represents the operating income of the enterprise; K and L represent the net fixed assets and employees respectively; Mat is the intermediate input of the enterprise, namely the amount of goods and services purchased; Age is the age of the enterprise; State indicates whether the enterprise is a state-owned enterprise; Year, Industry is the annual and industry effect respectively; γ is the random error item. Among them, the status variables are LnK and Age; control variables are State; agent variable investment (LnI), that is, cash paid for the purchase of fixed assets, intangible assets; LnL, LnMat, Year, Industry is the free variable; exit variable is Exit (based on the industry changes and major events).

2) OLS sub-industries by annual return

To calculate total factor productivity, start with the Cobb-Douglas production function (Li & Hu, 2012), and based on the model (2):

$$Y_{i,t} = \theta_0 + \theta_1 PPE_{i,t} + \theta_2 Employees_{i,t} + \eta_{i,t} \tag{2}$$

Among them, Y is the natural logarithm of the operating income of the enterprise, PPE is the natural log of the net fixed assets, and Employees is the natural logarithm of the number of employees. Total factor productivity TFP is the residual η of all A-share listed companies after the return of the industry according to the model (2)

3.3.2. Sustainable Growth Rate

Learn from previous studies (Li & Chen, 2016), this index generally represents the appropriate development speed of enterprises, and requires enterprises to pay attention to the balance between their business objectives and their operating efficiency and financial resources, and appropriately control the actual growth rate according to the sustainable growth rate, so as to achieve sustainable development. This paper, the sustainable growth rate is calculated by the model (3).

$$\text{Sustainable growth rate} = \text{Return on equity} * \text{Income retention rate} \Big/ \left(1 - \text{Return on equity} * \text{Income retention rate}\right) \tag{3}$$

3.4. Control Variables

This article draws on previous research (Meng, Li, & Zhang, 2019; Li & Chen, 2016) to control the relevant factors that affect the salary gap between executives and employees. These factors include company size (Size), equity concentration (First), asset-liability ratio (Lev), growth (Growth), equity nature (State), region (West and Mid), etc., which are defined in Table 1.

3.5. Model Design

Learn from previous literature studies (Li & Chen, 2016), to test the hypothesis H1a, this paper examines the impact of the internal compensation gap on employee productivity by building models (4).

$$\begin{aligned} TFP_{i,t} = &\alpha_0 + \alpha_1 IPG_{i,t} + \alpha_2 IPG_{i,t}^2 + \alpha_3 Wage_{i,t} + \alpha_4 First_{i,t} + \alpha_5 Sop_{i,t} \\ &+ \alpha_6 State_{i,t} + \alpha_7 Area_{i,t} + Year + \mu_{i,t} \end{aligned} \tag{4}$$

Among them, the explained variable TFP represents employee productivity, and the explanatory variable IPG represents the compensation gap between executives and employees, including IPG1, IPG2. In addition, other relevant variables are controlled in the model, including year. Because all the samples in this paper are manufacturing companies, their data are consistent and unbiased, so the industry is not controlled on the one hand, and panel data is not used for regression analysis on the other hand. Among them, area represents both West and Mid.

Table 1. Variable definition.

Variable	Variable interpretation
TFP	For full productivity, see the variable design for the specific explanation.
SGR	Sustainable growth rate, see variable design.
IPG	The relative value of the internal compensation gap between executive and employee is explained in the variable design.
Overipg	The internal compensation gap is too large, and the difference is larger than expected, otherwise 0. See the model (6) for specific calculation.
ESOP	ESOP, the company implementing the ESOP is 1, otherwise 0.
Wage	The average salary of the total employee is equal to the natural log of the average salary of the total employee.
Employee	The number of employees is equal to the number of employees.
Size	The size of the company is equal to the natural log of the total assets at the end of the year
First	Equity concentration is equal to the ratio between the largest shareholder among the top ten shareholders and the other nine shareholders
Lev	Asset-liability ratio, the ratio of other total assets to total liabilities
ROA	Operating performance, equal to the final net profit divided by the average total assets
State	The nature of enterprises, state-owned enterprises take 1, non-state-owned enterprises take 0
West	If the virtual variable in the region where the enterprise is located, the listed company is registered in Shaanxi, Chongqing, Guizhou, Yunnan, Sichuan, Gansu, Ningxia, Qinghai, Xinjiang, Tibet, etc., West or 0
Mid	If the virtual variable of the enterprise is registered where the listed company is Henan, Shanxi, Hubei, Anhui, Hunan, Jiangxi, etc., Mid is 1, otherwise it is 0
Sop	Whether the chairman and the general manager are the same person, the same person takes the value of 1, otherwise it is 0.
Industry	Industry virtual variables
Year	Virtual Variables of the Year

To test the hypothesis H1b, this paper examines the effect of the internal compensation gap on the sustained growth rate by building a model (5).

$$\text{SGR}_{i,t} = \beta_0 + \beta_1 \text{IPG}_{i,t} + \beta_2 \text{IPG}_{i,t}^2 + \sum \beta_i \text{Control}_{i,t} + \delta_{i,t} \tag{5}$$

Among the explained variables, SGR represent sustained growth rate, IPG and model (4) are consistent, control variables join the company size (Size) and number of employees (Employees), delete average employee compensation (Wage), and other variables remain unchanged.

4. Statistical Analysis

4.1. Descriptive Statistics

The descriptive statistics are given for the main variables. It can be seen from the table that the total factor productivity (TFP_OP and TFP_OLS) between manufacturing enterprises, the mean of 16.84 and 0 and the median of 16.77 and −0.04, TFP_OLS is not different from the previous literature; There is a little difference between TFP_OP and previous literature, mainly due to the selected investment agent indicators. The average sustained growth rate (SGR) is 0.03, indicating that China's manufacturing enterprises are not optimistic in long-term sustainable growth. The average of Compensation Gap Ratio (IPG1, IPG2)

of 16.31, 25.96 indicates that the compensation gap between the executive and employee increases and the equity incentive of most sources of the executive and employee compensation gap, which is further reflected by the gap between maximum and minimum. The mean of the primary regulatory variable ESOP was 0.31, indicating that approximately 31% of businesses in manufacturing companies designed and implemented the ESOP. The mean degree of equity concentration (First) is 2.14, the median is 1.30; the mean separation of two positions (Sop) is 0.30, the 75-quantile is 1, indicating that the high degree of equity concentration and more than a quarter of Chinese manufacturing enterprises have large executive rights. The mean and median of other related variables are within the normal range (Table 2).

4.2. Empirical Analysis Results

4.2.1. Basic Regression Outcome Analysis

Hypothesis H1a was first tested using model (4). In Table 3, columns (1) and (2) show the return of the executive-employee internal compensation gap to employee productivity. Under the measurement caliber of both internal compensation gap ratio, the primary term of IPG is significantly positive at the 1% level with coefficients of 0.0246 and 0.0.0148 respectively, indicating that the internal compensation gap promotes employee production efficiency; the secondary term of IPG is significantly negative at 1%, with coefficients of −0.0000966 and −0.0000355, which indicates that the large internal compensation gap ratio inhibited employee productivity without other factors. Thus, there is an inverted U relationship between the internal salary gap between manufacturing executives and employees and employee production efficiency, and the empirical results support the assumption of H1a.

Table 2. Descriptive statistics.

Variable	Sample size	mean	standard error	The 25-quantile	median	The 75-quantile	Minimum value	Maximum value
TFP_OP	5260	16.84	1.22	16.03	16.77	17.53	11.23	20.73
TFP_OLS	5260	0.00	0.54	−0.36	−0.04	0.32	−1.99	2.65
SGR	5260	0.03	0.14	0.01	0.04	0.08	−0.71	0.43
IPG1	5260	16.31	26.22	4.99	8.28	15.17	1.74	186.6
IPG2	5260	25.96	42.24	7.91	13.15	24.10	2.75	305.9
Size	5260	22.43	1.11	21.66	22.32	23.05	20.14	25.80
Employee	5260	8.03	1.09	7.29	7.96	8.71	5.48	11.03
Wage	5260	11.55	0.39	11.29	11.51	11.79	10.69	12.68
State	5260	0.27	0.44	0.00	0.00	1.00	0.00	1.00
First	5260	2.14	2.35	0.76	1.30	2.49	0.27	13.50
Sop	5260	0.30	0.46	0.00	0.00	1.00	0.00	1.00
Lev	5260	0.43	0.19	0.28	0.42	0.57	0.07	0.96
ESOP	5260	0.31	0.46	0.00	0.00	1.00	0.00	1.00

Table 3. Internal compensation gap and enterprise sustainable development capacity.

Variable name	(1) IPG1	(2) IPG2	(3) IPG1	(4) IPG2
	TFP _OP		SGR	
IPG	0.0246***	0.0148***	0.00180***	0.00106***
	(16.08)	(15.70)	(9.20)	(8.82)
IPG^2	−0.0000966***	−0.0000355***	−0.00000894***	−0.00000319***
	(−10.24)	(−9.98)	(−7.56)	(−7.17)
Constant	13.86***	13.93***	−0.257***	−0.255***
	(29.45)	(29.54)	(−5.16)	(−5.11)
Control	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Sample size	5260	5260	5260	5260
adj.R^2	0.280	0.277	0.049	0.048

Note: With the t statistic in parentheses, *, * *, * * * indicates 10%, 5% and 1% statistical level, respectively.

Secondly, the hypothesis H1b was tested by using the model (5). In Table 3, lists (3) and (4) show the return of executive-employee internal compensation gaps on sustained growth rates. In the measurement caliber of both internal compensation gap ratios, the primary term of IPG is significantly positive at the 1% level with coefficients of 0.0018 and 0.00106, respectively, which indicates that the internal compensation gap promotes the sustained growth rate without other factors; the secondary term of IPG is significantly negative at 1%, with a coefficient of −0.00000894 and −0.00000319, which indicates that the internal compensation gap ratio suppresses the sustained growth rate without other factors. Therefore, there is an inverted U relationship between the internal salary gap between manufacturing executives and employees and the continuous growth rate, and the empirical results support the assumption of H1b.

4.2.2. The Impact of the ESOP Program

The previous regression results showed that the salary gap exceeded the conference to curb employee productivity. So does ESOP, closely related to employees, slow down this inhibitory effect? As a long-term benefit program for employees, ESOP has a history of hundreds of years in western countries, and thus produced rich interpretations of ESOP theory, such as human capital theory (Oliver, 1975), sharing economy theory (Weitzman, 1984), stakeholder theory (Freeman, 1984) and economic democracy (Ellerman, 1992; Jiang, 1989). After the ups and downs in the 1980s-1990s in China, the reintroduction of ESOP in 2014 is an important institutional exploration based on China's securities market by drawing lessons from the western advanced experience and summarizing its own previous practical lessons in recent years. The re-introduction of the system design aims to let employees actively participate in the operation of the capital

market, share the achievements of economic construction, form the interest sharing mechanism of capital owners and workers, and promote the healthy development of enterprises. It is an important measure to improve the sustainable development ability of the manufacturing industry. Therefore, it is of great practical significance to study whether to implement the adjustment effect of the internal salary gap and the employee production efficiency.

This paper draws from Miao Yi et al. (2016) the idea that each enterprise has a recognized internal salary gap for each enterprise, and exceeding the expectation value means that the internal salary gap is relatively too large. Specific regression models (6) are as follows:

$$\mathrm{IPG}_{i,t} = \lambda_0 + \lambda_1 \mathrm{Size}_{i,t} + \lambda_2 \mathrm{Lev}_{i,t} + \lambda_3 \mathrm{State}_{i,t} + \lambda_4 \mathrm{Area}_{i,t} + \lambda_5 \mathrm{ROA}_{i,t}$$
$$+ \mathrm{Year} + \mathrm{Industry} + \varepsilon_{i,t} \tag{6}$$

Among them, IPG represents the compensation gap between executives and employees, including the specific definitions of other variables where IPG1, IPG2; Area represents the region (West and Mid) are shown in Table 1. This paper first, the internal compensation gap returns to assets and performance, and then takes the positive residual symbol, so as to represent the excessive internal compensation gap between executives and employees.

To assume H2, this paper builds the model (7) and introduces the new virtual variable ESOP to represent the ESOP, the other variables share the same model (6).

$$\mathrm{TFP}_{i,t} = \theta_0 + \theta_1 \mathrm{Over\ ipg}_{i,t} + \theta_2 \mathrm{Over\ ipg}_{i,t} \times \mathrm{ESOP}_{i,t} + \theta_3 \mathrm{ESOP}_{i,t}$$
$$+ \sum \theta_i \mathrm{Control}_{i,t} + \nu_{i,t} \tag{7}$$

In Table 4, columns (1) and (2) report the return results of the impact of the ESOP on the excessive pay gap. Among them, both Overipg1 and Overipg2 were significantly negative at the 1% level, indicating that the excessive compensation gap had an inhibitory effect on employee productivity, consistent with the conclusions of previous studies; while both Overipg1*ESOP and Overipg2*ESOP are significantly positive at the 10% level, indicating that the implemented companies are able to slow the inhibitory effect of excessive pay gap on employee productivity compared to the ESOP companies, and empirical results support the assumption of H2.

4.2.3. A Detailed Study of the ESOP

The previous research results show that the ESOP can slow down the inhibitory effect of excessive internal compensation on employee productivity. However, on the one hand, the ESOP content is more complex, both the key points and starting points are also designed by ESOP, planners, and the results will be very different; on the other hand, ESOP benefits ordinary employees and stock sources from secondary market bidding and directional transfer of major shareholders, making it easier for major shareholders and management to share their own interests in the scheme design. The study found that the ESOP is mixed

Table 4. The Impact of the ESOP and the lagging Phase I inspection.

Variable name	(1) IPG 1	(2) IPG 2	(3) IPG 1	(4) IPG 2
	TFP_OP		TFP_OP	
Overipg	−0.00141***	−0.000864***		
	(−3.49)	(−3.43)		
Overipg*ESOP	0.00142*	0.000873*		
	(1.81)	(1.76)		
ESOP	0.0132	0.0134	0.00338	0.00345
	(1.02)	(1.03)	(0.24)	(0.24)
LOveripg			−0.00147***	−0.000918***
			(−3.21)	(−3.20)
LOveripg*ESOP			0.00148**	0.00092**
			(2.22)	(2.20)
Constant	−1.173***	−1.174***	−0.369	−0.369
	(−3.47)	(−3.47)	(−0.82)	(−0.82)
Control	Yes	Yes	Yes	Yes
Year/Industry	Yes	Yes	Yes	Yes
Sample size	5260	5260	5260	5260
adj.R^2	0.899	0.899	0.899	0.899

Note: With the t statistic in parentheses, *, * *, * * * indicates 10%, 5% and 1% statistical level, respectively.

with subjective will, such as major shareholder reduction motivation and self-profit motivation (Hao, Jin, & Zhang, 2019), management and major shareholders' will to conduct market value management motivation (Chen, Lyu, & Huang, 2020), the result is that employees cannot get actual benefits. So how can we design the ESOP to give employees practical benefits, and then adjust the pay gap and the sustainable development ability of enterprises? Previous research found that relative to mature equity incentive, ESOP stock source for major shareholders directional transfer, ESOP sources of funds is employees out of pocket, the vast majority of ESOP no performance conditions, the effect is the form of ESOP more flexible variety, ordinary employees bear a higher risk of market fluctuations and employees eventually return presents the "day" embarrassing situation (Hao, Jin, & Zhang, 2019). Therefore, this article intends to conduct detailed research on the relevant parts involved in the ESOP plan, explore the impact of the relevant content on the sustainable development ability of manufacturing enterprises, and then provide reference for manufacturing enterprises to design the ESOP. This article intends to explore the ESOP in terms of the employee contribution ratio (Posc) and the proportion of participants to total employees (Pop).

The results of the detailed test are shown in Table 5 and columns (1) and (2), reporting the regression of employee contribution and employee efficiency. The

regression coefficient of Posc and TFP_OP is significantly positive at the 5% level, indicating that without the impact of other factors, the higher the employee contribution ratio, the higher the production efficiency; mainly due to the lower the employee contribution, the higher the leverage ratio of ESOP, the higher the additional financial risk assumed by the employee. The coefficient of IPG*Posc is significantly negative at 5%, indicating that the higher the proportion of employee contribution without other factors, the promotion effect of the internal salary gap will reduce, mainly due to the high proportion of employees, employees need to bear more market risk and opportunistic risk of major shareholders or management, employees can obtain low benefits from ESOP. Columns (3) and (4) report the return of the proportion of participants to total employees to employee productivity. IPG*Pop coefficient on the level of 1% and 5%, respectively, shows that the number of ESOP participation in the number of total employees, the internal salary gap on employee efficiency will be strengthened, mainly from the more the number of participation, the more employees tied with the interests and goals of the company, the result is that more employees will take the initiative to put into production and maintain the production process.

Table 5. Influence of the employee capital contribution ratio and the proportion of participants.

Variable name	(1) IPG1	(2) IPG2	(3) IPG1	(4) IPG2
	TFP_OP		TFP_OP	
Posc	0.0530**	0.0532**		
	(2.17)	(2.18)		
Pop			−0.162**	−0.162***
			(−2.74)	(−2.74)
IPG	0.00454***	0.00289***	0.00241***	0.00154***
	(5.00)	(5.03)	(5.71)	(5.77)
IPG*Posc	−0.00179**	−0.00113**		
	(−2.19)	(−2.19)		
IPG*Pop			0.00242***	0.00153***
			(3.49)	(3.43)
IPG^2	−0.0000129***	−0.0000052***	−0.00000817***	−0.00000328***
	(−3.77)	(−3.76)	(−3.16)	(−3.19)
Constant	1.167***	1.166***	1.226***	1.224***
	(3.84)	(3.84)	(5.00)	(4.99)
Control	Yes	Yes	Yes	Yes
Year/Industry	Yes	Yes	Yes	Yes
Sample size	5260	5260	5260	5260
adj.R^2	0.188	0.189	0.183	0.183

Note: With the t statistic in parentheses, *, * *, * * * indicates 10%, 5% and 1% statistical level, respectively.

5. Robustness Test

5.1. Excluding the Relevant Industries

Learning from the previous literature (Yang, 2015), manufacturing enterprises are classified by double-digit industries, and mineral, oil and other industries are not applicable to the TFP analysis of existing methods. Since natural resources have important roles in the production process, the production functions of these industries cannot be simply assumed as the C-D production function. In addition, the production function of the service industry is also more complex, which can be characterized by the C-D function. Therefore, according to the above-mentioned standards, this paper excludes mineral mining, petroleum and other resource-based industries and water, electricity and gas production and supply industries, and once again tests the hypotheses H1a, H1b, and H2. The coefficient signs and significance of the regression results are consistent with the previous results, again supporting the hypotheses H1a, H1b, and H2.

5.2. Replace the Explained Variable

There are many methods to calculate total factor productivity as listed above parametric, semiparametric, and non-parametric methods. To maintain the reliability of the results, this article intends to draw on the the LP method used to estimate TFP by Lu Xiaodong and Lian Yujun (2012), and use the total factor productivity calculated by OLS and by industry and year regression from Li Wenjing and Hu Yuming (2012). Test hypothesis H1a.The test results show that, the primary term coefficient of IPG is significantly positive at the 1% level and the quadratic term coefficient of IPG is significantly negative at at least 10%, consistent with the previous conclusion.

5.3. The Endogenous Test

Internal issues must be considered when studying the relationship between the pay gap and corporate performance. Although the problem of employee productivity instead of enterprise performance will weaken, the salary gap ratio in this paper considers the part in executive compensation changes, which is related to enterprise performance in the current period. Therefore, to avoid reverse causality, this paper draws from Li Ping and Chen Xinmin (2016) and uses the proportion of executives selected to the total number of employees, the proportion of executive holding to total share capital and the proportion of director holding to total equity to serve as instrumental variables for the internal compensation gap (IPG) of this article. Since the Hausmann test of the regression model between the internal pay gap and the sustained growth rate found that 24.02% of the probability believes that all explanatory variables in the model are exogenous, this article only discusses the endogenous issue between the internal pay gap and employee productivity. Prior to performing the LIML and GMM regression, the tool variables were tested for both exogenous and weak tool variables. And the

Table 6. Tool variable test.

Variable name	(1)	(2)		(1)	(2)
	LIML	GMM		LIML	GMM
IPG2	0.547***	0.551***		(−2.04)	(−1.18)
	(3.63)	(3.61)	Control	Yes	Yes
IPG2^2	−0.00299***	−0.00302***	Year	Yes	Yes
	(−3.32)	(−3.30)	Industry	Yes	Yes
Constant	−22.61**	−10.69	Sample size	5260	5260

Note: With the t statistic in parentheses, *, * *, * * * indicates 10%, 5% and 1% statistical level, respectively.

test showed that 35.96% of all instrumental variables were exogenous, however, redundancy tests on the proportion of director holdings to total equity found strong acceptance of the variable as a redundant tool variable. Therefore, this article eliminates the proportion of the director holding to the total share capital, only the proportion of the total employees and the proportion of the executives to the total share capital stock are taken as the instrumental variables in this paper. The F values for both IPG2 and IPG2^2 regression were significant at the 1% level, which shows that selecting tool variables has strong interpretation for the compensation gap, and the tool variables are initially considered to be valid. The corresponding instrumental variable method yields the regression results as shown in Table 6, the primary term coefficient of IPG is significantly positive at the 1% level and the quadratic term coefficient of IPG is significantly negative at at least 10%, consistent with the previous conclusion.

Because hypothesis H2 has a cross-multiplication term and the use of instrumental variables is more complicated, this article intends to draw on the research of Liu Chun and Sun Liang (2010) and use the number of lagging periods of the pay gap as an instrumental variable to deal with endogenous issues. As shown in Table 4, columns (3) and (4) report regression results assuming H2 lag phase I, where the coefficients of both LOveripg1*ESOP and LOveripg2*ESOP are significantly positive at the 5% level; consistent with the previous conclusion.

6. Research Conclusion and Significance

With the transformation and upgrading of China's industry and the transformation from a "large manufacturing country" to "manufacturing power", the sustainable development capacity of the manufacturing industry has become particularly critical. For Chinese manufacturing enterprises that are still in the primary stage of manufacturing technology level, labor force factors play a decisive role in the production efficiency of enterprises, thus affecting the sustainable development ability of manufacturing enterprises, and the sustainable development ability cannot be separated from the support of financial and other resources. Therefore, this paper selects employee productivity and sustainable growth

rate as proxy indicators for the sustainable development capacity of manufacturing enterprises. At the same time, as general secretary stressed that "as China to build a well-off society in an all-round way, open a new journey of modern socialist country in an all-round way, we must promote the common prosperity in a more important position", in the micro embodiment is that the focus of salary distribution began to change from efficiency to fairness, and enterprise executives and ordinary employees of the salary gap have become the focus (Wen, Zeng, & Chen, 2020). Therefore, starting from the internal salary gap between executives and employees, this paper studies the impact on the sustainable development ability of manufacturing enterprises and the adjustment effect of the ESOP, and explores the ESOP. The study found that: first, the internal compensation gap brings benefits to manufacturing enterprises to enhance the long-term development ability of enterprises, but this incentive also has an interval effect, that is, there is an inverted U relationship between the internal compensation gap ratios between manufacturing executives and employee and employee production efficiency and sustainable growth rate. Second, the implementation of the ESOP can reduce the inhibition of excessive internal compensation on employee production efficiency. Third, detailed research found that the design motivation of the ESOP is only from the perspective of employees, such as a low employee investment ratio and a wide range of employee participation, and the sustainable development ability of manufacturing enterprises can be effectively improved. Fourth, the corresponding hypothesis is tested by the introduction of tool variables and the lagging first phase of the related variables, and the conclusion still holds.

The theoretical and practical significance of this paper: First, in theory, it expands the research scope on the sustainable development capacity of the manufacturing enterprise, and complements the market value management and the motivation of major shareholders. Second, whether state-owned enterprises or private enterprises, compensation gap on manufacturing enterprise sustainable development ability promote interval effect, namely large internal salary gap will lead to enterprise sustainable development ability to reduce, which is an important criterion in the SASAC several head of state-owned enterprises compensation adjustment method: the executives and employee salary gap within a certain difference, because too large salary gap is not conducive to the long-term development of enterprises (Li & Chen, 2016). These relevant compensation reform measures are worth the private enterprises to implement the corresponding executive and employee compensation system according to their own characteristics, which can extend the promotion effect of the internal salary gap on the sustainable development ability of enterprises. Third, the original intention of the ESOP is to make employees become some owners, can participate in the sharing of business performance, and then pay more attention to the long-term development of the enterprise and actively participate in manufacturing. However, with the development of social and economy and investors' enthusiasm for cap-

ital games, the ESOP began to become a tool for major shareholders for market value management, risk transfer and cash out, which runs counter to its original intention, thus affecting the sustainable development ability of enterprises. Through detailed ESOP research, this paper hopes to provide reference value for manufacturing enterprises in designing and implementing the ESOP.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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