

The Impact of Intra-company Pay Gaps and External Government Grants on Company Performance

-- The Guangdong Pharmaceutical Industry as an Example

Kaiyi Zheng, Yanlin Chen, Yutong Jiang*, Tianyue Lan and Zhiqing Zhou

School of South China Normal University, Guangzhou 510000, China

*811628250@qq.com

Abstract

The outbreak of the new crown epidemic has led to a strong public interest in the health industry and pharmaceutical companies have become the new wealth code in the secondary market. In China's unique context and system, the focus is on how to make pharmaceutical companies consistently competitive. The Chinese government has acted as a "booster" for corporate reform and development in a number of industry sectors, and it remains to be seen how government subsidies as external incentives affect the performance management of pharmaceutical companies. In addition, the medical industry is part of the high-tech sector, and the human capital within companies is also important to the study of company performance, and the reasonableness of the pay gap within companies affects their performance and thus their competitiveness. Based on the current situation, this group will use literature, empirical research and interview research to conduct a more in-depth practical study on the inner relationship between the pay gap of internal employees and external government subsidies and the gap between their effects on corporate performance, in order to provide valuable suggestions for the self-growth of pharmaceutical companies and the long-term development of the pharmaceutical industry.

Keywords

Performance Management; Internal Pay Gap; Government Grants; Pharmaceutical Industry.

1. Introduction

The new crown epidemic has caused the general public to pay great attention to their own health, effectively catalyzing national interest in the pharmaceutical industry. Over the past two years, Chinese pharmaceutical companies have excelled in the market and the dividends from the industry's ongoing reforms have gradually emerged. While market sentiment in the pharmaceutical industry is high, it is also facing serious challenges in terms of how to set up reasonable incentives internally and externally so that pharmaceutical companies can continue to improve their competitiveness as the focus of attention.

For the pharmaceutical industry, which belongs to the high-tech sector, its corporate performance is closely related to government subsidies and the internal pay gap. Therefore, this paper investigates the intrinsic relationship between the pay gap of internal employees and external government subsidies of listed pharmaceutical companies and corporate performance, and the effect of the gap, which is important for improving the operation of listed pharmaceutical companies and saving incentive resources.

2. Literature Review

2.1. Impact of Government Grants on Corporate Performance

Research on the relationship between government grants and financial performance is more nuanced. First, a large number of studies have shown that the impact of government subsidies on financial performance is related to the type of firm as well as the method of government subsidies. Cao Yang et al. (2018) found that government subsidies to pharmaceutical companies usually take the form of direct R&D subsidies, and that the continuity of subsidies has a catalytic effect on firm performance. Wang Xinhong et al. (2019) found that government subsidies are beneficial to the financial performance of enterprises, but this finding lacks universality and is not applicable to enterprises in the north.

It is worth noting that most experts, such as Ye (2019), point out that government subsidies are mostly granted in the form of R&D investment in science and technology, and that their impact on innovation performance of high-tech enterprises is in an "inverted U-shape". On the level of R&D quality, Zhang (2021) finds that government subsidies are positively related to the quantity of innovation, but have a significant inhibitory effect on the quality of innovation.

2.2. Impact of Intra-firm Pay Gap on Firm Performance

The Intra-firm pay gap is usually expressed as the pay gap between executives and employees within a firm. Zhang Zhengtang (2008) found that the impact of Intra-firm pay gap on firm performance is related to firm attributes, with a high positive correlation for firms in the high-tech sector.

Regarding the effect of Intra-firm pay gap on innovation, Sun Qiheng et al. (2021) found that Intra-firm pay gap had a significant positive contribution to firm innovation performance, but the effect of this effect depended on the nature of the ultimate controller, and the effect of Intra-firm pay gap on innovation performance contribution was more significant in non-SOE holding firms.

2.3. Research on Corporate Performance Management

Corporate performance is influenced by a number of indicators, and domestic and international scholars differ in their views on the corporate size factor. Foo Nin Ho (2019) selected North American companies to study the relationship between corporate social performance and corporate size and found that the growth of corporate size allows companies to use their resources to achieve greater economies of scale and generate better social performance over time. In contrast, Zhang Zhihua et al. (2022) found a significant negative relationship between R&D investment and current corporate performance, i.e. the higher the level of internal control, the lower the intensity of corporate R&D investment.

In terms of how corporate performance is measured, Guo Jun (2017) found that performance management based on financial indicators, development indicators and management indicators helps companies achieve their strategic goals. Chen Yufen (2005), on the other hand, improved on the shortcomings of the existing enterprise technology innovation performance evaluation system, with new specific indicators including the number of patent applications, new product sales rate and new standards.

2.4. Literature Review Review

At present, there are many research findings on the impact of government subsidies and internal pay gaps on corporate performance, but there is a lack of research on internal pay gaps in pharmaceutical companies, most of which only selects one perspective to study the impact of incentives, while there is not enough literature on the combined effect of external and internal factors on corporate performance. In addition, scholars have often based their performance rating systems on balance sheets and income statements, but lack a

comprehensive performance rating system that measures financial performance, innovation performance and cash flow indicators.

3. Theoretical Analysis and Research Hypothesis

The difference in pay between executives and employees is a sign of recognition and appreciation of the executive's commitment and ability. Executives gain a sense of responsibility and recognition by being paid more than the average employee, reducing free-riding and improving company performance. At the same time, equity and relative exploitation theories suggest that individuals seek equality in their exchange relationships with companies. When the risk-reward ratio is lower than that of the control group, employees will feel distorted and oppressed, and will consciously reduce their input to protect themselves and mitigate the sense of inequity. As a result, the pay gap undermines cohesion and creativity among employees and weakens the productivity and profitability of the company.

Pharmaceutical companies are high-tech enterprises, and the overall strong overall quality of their employees demands a corresponding salary income, and the overall level of employee remuneration is high. The two competitive doctrines are combined with the process of reforming China's economic system - by widening the income gap and ultimately liberating productivity. This paper argues that releasing the spontaneity of operators is the key to improving corporate performance. Based on the above analysis, this paper proposes the following hypotheses.

H1: The internal pay gap has a positive impact on pharmaceutical company performance.

Most academics believe that government inputs have a positive impact on business performance. Government subsidies, as a direct means of government intervention in the market, play a large role in maintaining social objectives. Chen Zhichao (2020) points out that according to externality theory, when there is a market failure situation, government subsidies as an external resource can help enterprises optimise their financial situation and resource allocation, using the ability of government subsidies to help enterprises offset the effect of negative externalities and enable them to reach Pareto optimality. According to the soft budget constraint phenomenon, when a company is faced with a difficult business problem, it will use external organisations, especially the government, to help it survive. Thus, the firm can continue its economic activities and improve its financial position by using the power of government input.

Internally, companies investing large amounts of capital in R&D may face problems such as collapsing capital chains and R&D failures; externally, most financial institutions are reluctant to take the huge risk of providing funds for lending, which makes it difficult for many poorly performing pharmaceutical companies to finance their R&D. According to the Matthew effect, the strongest are stronger and the weakest are weaker. Increased government investment in pharmaceutical companies can regulate market failures, mitigate the effect of the Matthew Effect, help pharmaceutical companies to combat financing difficulties and promote corporate performance.

According to resource dependency theory, companies need to trade with each other in order to obtain differential resources. In order to survive, pharmaceutical companies interact and trade with companies that have the resources they need. According to resource dependency theory, external government grants can bring external funding to pharmaceutical companies and have an impact on their performance. Based on the above analysis, the following hypotheses are formulated.

H2: External government input has a positive impact on pharmaceutical company performance.

The unstable output rate of the R&D sector of pharmaceutical companies is in conflict with the high expectations of investors due to adverse selection behaviour caused by information

asymmetries. Government subsidies can reduce the financing constraints of the R&D sector and act as a positive signal for the company, confirming the reliability of the R&D sector of pharmaceutical companies from the official path, weakening the effect of information asymmetry and thus facilitating the R&D sector to obtain more market financing and produce more R&D performance. This effect is universal and does not differ between companies.

According to Hu Weimin (2021) based on the dynamic panel quantile regression method, the degree to which firm performance is influenced by the Intra-firm pay gap varies with the development of the firm. When firm performance is in the 0.1-0.2 quantile, i.e. when firm performance is low, the relationship between Intra-firm pay gap and firm performance is positive and large. When company performance is in the 0.3-0.9 quartile, there is little difference in the degree to which company performance is positively influenced by the internal pay gap. This suggests that the impact of the internal pay gap on company performance varies across companies at different levels.

Combining the results of the interview research, i.e. the different adjustment cycles of internal remuneration and external government grants, and the difference in the impact of each on corporate performance, the following hypothesis is proposed.

H3: There is variability in the extent to which internal pay gaps and external government grants affect company performance.

4. Model Construction and Data Analysis

4.1. Sample Selection and Data Processing

This paper selects the data of 30 listed pharmaceutical enterprises in Guangdong Province from 2018 to 2020 as the sample for the study. In addition, to ensure the accuracy of the empirical data, this paper makes the following screening of the raw data (1) exclude ST and *ST enterprises; (2) exclude years with serious data deficiencies. Finally, 210 observations were selected. All data in this paper were obtained from the WANDER database and the annual reports of enterprises, and the relevant indicators were obtained through EXCEL processing, and the relevant data were analysed using MPLUS.

4.2. Selection of Indicators

1. Explanatory variables

Government grants (GOV), the ratio of the amount of government grants received by pharmaceutical companies to their operating income is chosen to measure the extent of government grants to pharmaceutical companies.

Pay gap (Gap), this paper refers to the study of Zhang Yuemei et al. (2017), which uses monetary compensation as a proxy variable for executive and employee compensation, and defines the Intra-firm pay gap as the ratio of the average compensation of the top three executives to that of the average employee (Zhao Jianmei, 2017).

2. Explained variables

According to previous literature, financial indicators for measuring enterprise performance generally include enterprise market capitalisation, return on total assets and profitability of main business, all of which reflect the ability of the enterprise to operate. Based on Cao Pu's (2008) analysis of enterprise performance evaluation systems, this research constructs an evaluation system that introduces cash flow indicators and uses cash flow (CF, cash recovery rate of total assets) to measure enterprise financial performance.

In this paper, the number of patent applications (IP) was selected to measure the innovation performance of pharmaceutical companies (Sun Hui et al.) and the natural logarithm of total assets (SIZE) to measure the efficiency of firm size.

3. Variable selection

The financial performance and innovative inventions of pharmaceutical companies are inevitably influenced by other factors. Drawing on the research of other scholars, this paper identifies the control variables as: the market capitalisation of the company (MV) and the gearing ratio (LEV).

Table 1. Description of variables

Nature of variables	Variable name	Variable symbols	Calculation methods and instructions
Explanatory variables	Government grants	GOV	Government grants/operating income
	Pay gap	Gap	Average remuneration of top three executives/average remuneration of ordinary employees Average remuneration of other employees = (cash paid to and on behalf of employees + end of period remuneration payable to employees - beginning of period remuneration payable to employees - total remuneration of the top three highest paid executives) / (total number of employees on board - 3)
Explained variables	Business size	SIZE	Natural logarithm of total assets
	Cash flow	CF	Net cash flows from operating activities/total assets at the end of the period
	Number of patent applications	IP	Number of patent applications filed by the company per year
Control variables	Corporate Market Capitalisation	MV	Market value of the company at the end of the year
	Gearing ratio	LEV	Liabilities/total assets

4.3. Descriptive Statistics

Table 2. Variable data

	Minimum value	Maximum value	Average value	Standard deviation	Sample size
Pay gap	2.03	49.89	13.78	10.56	121
Total market value	1527598.25	496823863.14	70978016.44	91129065.82	121
Return on assets	-55.03%	140.52%	11.94%	18.52%	121
Gross margin of main business	5.22%	6353.00%	104.98%	573.18%	121
Number of patents	0	244	21.31	40.57	121
Business size	19.80	25.04	22.53	1.29	121
Gearing ratio	2.93%	119.49%	33.12%	18.94%	121
Cash flow	-0.15	5822764034.08	48122016.91	529342184.91	121

As can be seen from the table above, the maximum difference between the remuneration of executives and employees of listed companies in China is as high as RMB 490,000, with a significant gap, and most of the company's wealth goes to the executives, with an average value

of RMB 130,000, which is within a reasonably acceptable range. The worst return on total assets reached around -50%, i.e. a net loss of 50% of the company's total assets, a situation that can seriously lead to every deterioration of the company and requires vigilance, but the average value of the company's return on total assets was 11.94%, indicating that, with the exception of individual companies, the overall performance is now good. The maximum value, however, was around 140%, indicating a marked difference in performance between companies. The gross margin on main business, cash flow and return on total assets are similar, all reflecting the wide disparity between the different companies' operating conditions. Of note is the number of patents, with each company having an average of 20 patents, thus indicating a strong R&D capability and a clear performance in research, with the highest number reaching 244 patents. In terms of business size, there is little difference between the sample companies. The average value of the sample companies for the gearing ratio is in the normal range and the standard deviation is small, indicating low volatility, but the maximum value exceeds 1, indicating that the amount of debt exceeds the amount of assets and that the company is operating dangerously.

4.4. Structural Equation Modelling

1. Model construction

The author first constructs a conceptual model of structural equations based on the latent variable internal and external policies and its indicators (x1, 2x-x5), the latent variable firm performance and its indicators (Y1, y2-y4) and the theoretical assumptions (H1-H3), adds control variables according to the theoretical basis, excludes the interference of firm market capitalisation (x4) and gearing ratio (x5), then solves the model, performs model parameter estimation, finds parameters so that the model implies. However, the model did not meet the expected goodness of fit. The author then began to revise the model by adding new paths based on the revised indices, linking the pay gap (x3) and gearing (x5), firm size (y2) and the number of professional applications (y4), with a reduction in the cardinality of the overall model improvement. The final model and results with good goodness of fit were obtained and the corresponding research hypothesis was verified.

2. Model construction

Based on the previous theoretical study, the author selected seven variables to construct a structural equation model to analyse the degree of influence of internal pay gap and external government subsidies on corporate performance, the symbols are illustrated in Table 3 below.

Table 3. Description of symbols

Symbols	Variables	Symbols	Variables
X1	Internal and external policies	Y1	Corporate Performance
x2	Government grants	y2	Business size
x3	Pay gap	y3	Cash flow
x4	Corporate Market Capitalisation	y4	Number of patent applications
x5	Gearing ratio		

This paper adopts the covariance structural model (LISREL), which consists of two parts: the measurement equation reflects the relationship between the observed indicators and the latent variables, while the structural equation shows the causal relationship between the exogenous latent variables and the endogenous latent variables. The observed indicators are those obtained directly from the annual reports of listed companies, while the latent variables are those that cannot be obtained directly from the data. This paper uses X1 (internal and external policies) as the exogenous latent variable and Y1 (corporate performance) as the endogenous

latent variable to analyse the impact between unmeasured variables using measurable variables.

Construct the measurement model: $\mathbf{X} = \Lambda_x \xi + \delta$, $\mathbf{Y} = \Lambda_y \eta + \varepsilon$

Constructing the structural model: $\eta = B\eta + \Gamma\xi + \zeta$

Λ_x - the relationship between the exogenous observed variable and the exogenous latent variable, being the factor loading matrix of the exogenous observed variable on the exogenous latent variable.

Λ_y - the relationship between the endogenous observed variable and the endogenous latent variable, being the factor loading moments of the endogenous observed variable on the endogenous latent variable.

B - the path coefficient, indicating the relationship between the endogenous latent variables.

Γ - path coefficient, indicating the effect of the exogenous latent variable on the endogenous latent variable.

ζ - the residual term of the structural equation, reflecting the part of the equation that fails to be interpreted in

3. Exclusion of model control variables

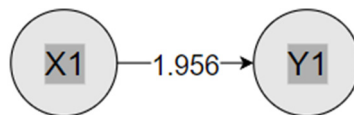


Figure 1. Diagram of the relationship between the hidden variables without control variables

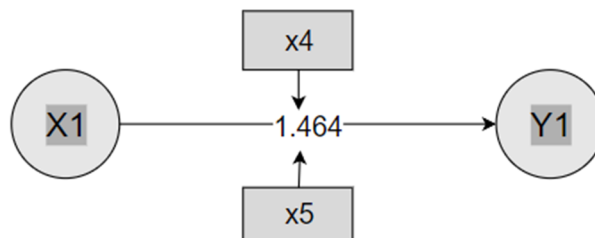


Figure 2. Diagram of the relationship between the hidden variables after adding control variables

First, this paper tests the control variables. On the basis of x2 (government subsidies) and x3 (pay gap) as independent variables and y2 (firm size), y3 (cash flow) and y4 (number of patent applications) as dependent variables, the correlations remain positive after adding the control variables x4 (firm market value) and x5 (gearing ratio), and the correlation coefficients of x1 and Y1 remain positive after adding the control variables before and after the addition of the control variables were 1. 956and1. 464, as shown above, the model outputs are not very different, in line with the intent of the control variables, improving stability and excluding the interference of the market capitalisation and gearing of the enterprises to the model.

Table 4. Effectiveness of the fitted indicators

Indicators	Evaluation criteria		Fitting values for this model
	Acceptable	Good	
Cardinality / Freedom	<5.0	<3.0	10.42325
SRMR	<0.10	<0.05	0.077
CFI	[0.7,0.9]	>0.9	0.620

The fit metrics for this structural equation model are shown in the table4 below and the model fit is not good under the generic evaluation criteria, therefore the model needs to be revised.

4. Model Correction

The model was corrected by linking the indicators. By looking for MI it was found that if x3 (pay gap) was linked to x5 (gearing) and y2 (firm size) to y4 (number of professional applications), the model fit would be improved. The estimated coefficients and fit indicators for the revised model are shown in the table5 below.

Table 5. Effectiveness of the fitted indicators

Indicators	Evaluation criteria		Fitting values for this model
	Acceptable	Good	
Cardinality / Freedom	<5.0	<3.0	2.762
SRMR	<0.10	<0.05	0.079
CFI	[0.7,0.9]	>0.9	0.880

According to the mplus output, comparing the fit condition before and after adding control variables, the CFI was 0.880 (>0.8), the SRMR was 0.079 (<0.08) and the chi-squared degrees of freedom ratio was 2.762 (<5), which led to a more satisfactory fit index for this model. A comparison of the fit indices before and after the inclusion of control variables reveals that the difference is not disparate, in line with the intent of the control variables, and the fit is somewhat improved, realising the value of the control variables, improving stability and excluding the interference of the market capitalisation and gearing of the enterprises to the model. The model after adding the control variables, which is the final model of this paper, is shown in the figure below.

5. Analysis of model results

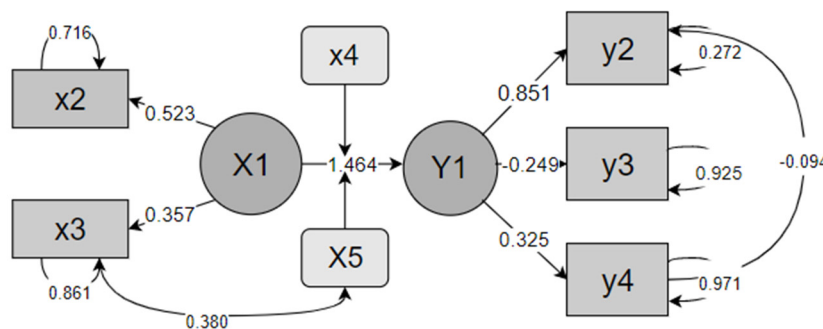


Figure 3. Graph of empirical test results

Note: The path coefficients between the hidden variables are unstandardised

The final structural equation model using visio software is shown above, with X1 (internal and external policies) and Y1 (firm performance) as the two hidden variables, X1 as the exogenous hidden variable and Y1 as the endogenous hidden variable. The path coefficients of X1 on the observed variables x2 (government subsidies) and x3 (pay gap) are 0.523 and 0.357 respectively, which suggests that government subsidies are a better indicator of internal and external policies than pay gap. This suggests that government subsidies are a better indicator of internal and external policies than the pay gap, and therefore the impact of government subsidies on firm performance is different from the pay gap, and the impact of government subsidies is stronger, which confirms the previous hypothesis. In addition, by looking at the Y1

path coefficients, it is found that there are differences in the path coefficients of Y1 on the observed variables y2 (firm size), y3 (cash flow) and y4 (number of patent applications), with firm size having the largest coefficient, and therefore firm size is more responsive to firm performance.

4.5. Conclusions of the Model Study

Based on the results of the above model, it was found that external policies, i.e. government subsidies and internal pay gap, had a significant impact on corporate performance, with government subsidies having a greater impact on corporate performance than the pay gap, by selecting indicators such as gearing ratio, corporate size and market capitalisation, and R&D scale.

5. Research Interviews

5.1. Interviewees and Basic Content

The interviewees for this paper were mainly administrative staff from pharmaceutical companies in Guangdong Province, and the interviews were conducted in a variety of formats to respond to the government's requirements for epidemic prevention and control. The team interviewed three staff members from different pharmaceutical companies using methods such as WeChat interviews and Tencent Conference online interviews.

A total of 12 questions were set for this interview to understand the awareness of the people involved in the pharmaceutical company from various perspectives on the theme of this practice.

5.2. Analysis of Interview Results

1. There was a high degree of overlap between the interviewer's and the group's thinking ideas in the inference of variable relationships and the selection of performance indicators.

2. Linkage of interview results to model results.

(1) There is a correlation between the link indicators of the model correction

Based on the responses of the three interviewees, members learned that the linking of indicators to make the model fit better had economic implications, and they generally agreed that the higher the gearing, the smaller the pay gap; and that the larger the firm, the more research senior staff it could attract, as well as more R&D funding, increasing the scale of R&D and resulting in more patents. This makes the model in this paper more realistic.

(2) The selection of model indicators is reasonable and generally consistent with the views of the interviewees

The indicators suggested by the interviewees were generally consistent with the general direction of the indicators selected for the model in this paper. One of the interviewees noted that he approved of the selection of indicators for this group's model and suggested that members of this group needed to focus on the stage of development of the companies, and that research companies at different stages might need to be measured by different indicators. This group selected all top-ranked listed companies, which are mature and basically at the same stage of development, so this again confirms the reasonableness of the selection of indicators in this paper.

(3) The model results are realistic and align with the respondents' reality

Interviewees indicated that government grants are indeed more beneficial to corporate performance than pay gaps in the actual operation of the company. Some interviewees explicitly stated that government grants are more effective than pay gaps because high pay can be a tool for executives' personal gain, while government grants can be directly credited to non-operating income and effectively improve corporate financial performance in the short term.

The social reality described by the interviewees aligns with the reported model results, confirming the relevance of the model.

6. Research Findings and Recommendations

Based on the results of the practical research, the group has made the following recommendations from the perspectives of pharmaceutical companies and government respectively.

6.1. For Pharmaceutical Companies

1. Strengthening the establishment of a sound supervisory and management mechanism

An analysis based on agency theory and the actual situation shows that high salaries can easily become a tool for executives to make personal gains in the absence of a monitoring mechanism. In order to maintain a positive working atmosphere, companies should strengthen their supervision and management mechanisms, recruit professional monitoring bodies externally and open up anonymous reporting channels for employees internally. This will allow each worker to match his or her pay with his or her reward and promote healthy competition within the company.

2. Rationalising the use of government grants for pay balance

To address the pay gap arising from multiple factors such as difficulty of work and job barriers, pharmaceutical companies should make reasonable use of government subsidies to balance pay, not only to balance project income and expenditure and promote positive growth, but also to motivate employees to work in a results-oriented manner to improve the performance of R&D projects. Clarify the routes of action for projects and strengthen the monitoring of the routes of action to ensure that both routes of action are efficient, precise and transparent. Weakening the Matthew effect within the company and increasing competition between employees of the same or different job nature to maximise benefits and welfare for the company and its employees.

6.2. For Government Departments

1. Targeted and special subsidies for pharmaceutical companies

Based on the interviews, the team understands that government subsidies to pharmaceutical companies are broadly divided into financial subsidies and talent subsidies. These subsidies tend to be in a single form and cannot meet the needs of pharmaceutical enterprises in the complex context of the new epidemic. To address this situation, the government should introduce more targeted subsidies to understand the difficulties and needs of medical companies in their operations, so as to provide more effective incentives for their R&D staff to carry out pharmaceutical research and development and to persevere in the fight against Neoplasmosis and its variants.

2. Improving the uneven distribution of government grants

In order to deepen performance upgrading and enterprise reform, the problem of uneven distribution of government subsidies in different areas and industries needs to be addressed, and relevant departments need to pay attention to it. The relevant government departments also need to pay more attention to supporting pharmaceutical manufacturing enterprises when formulating relevant industry policies, promoting the transformation of the pharmaceutical manufacturing industry to high-end manufacturing, and promoting the high-quality development of the entire pharmaceutical manufacturing industry. In the context of the new pneumonia epidemic, many companies have invested heavily in the research and development of drugs to combat the epidemic. The government should increase subsidies to incentivise

pharmaceutical companies that have made positive contributions to the fight against the epidemic.

References

- [1] Cao Yang, Yi Qiqi. The impact of government subsidies on firms' R&D investment and performance--an empirical study based on biopharmaceutical manufacturing industry[J]. Science and Technology Management Research,2018,38(01):40-46.
- [2] Wang Xinhong,Nie Yaqian. Government subsidies, R&D investment and firm performance[J]. Finance and Accounting Communication,2019(03):63-67+76.DOI:10.16144/j.cnki.issn1002-8072. 2019. 03.012.
- [3] Ye Qiaqing, Wang Kunqing. The impact of government R&D investment on firms' innovation performance--an empirical study based on Shanghai high-tech enterprises[J]. Scientific Research Management, 2019,40(07):78-86.DOI:10.19571/j.cnki.1000-2995. 2019.07.008.
- [4] Zhang Y. A., Guan Y. J.. Market demand, innovation policy mix and firm innovation performance - a firm life cycle perspective[J]. Science and Technology Progress and Countermeasures, 2021, 38 (01): 87-94.
- [5] Sun Qiheng,Zhang Lanxia. Nature of ultimate controller, executive-employee pay gap and corporate innovation performance[J]. Finance and Accounting Communication,2021(07):66-69+75. DOI: 10. 16144/ j.cnki.issn1002-8072.2021.07.011.
- [6] Foo Nin Ho et al. Nature and relationship between corporate social performance and firm size: a cross-national study[J]. Social Responsibility Journal, 2019, 15(2) : 258-274.
- [7] Zhang Zhihua, Zhang Xiaoyin. R&D investment intensity, internal control and firm performance - a perspective based on product market competition [J]. Journal of Yanbian University (Social Science Edition), 2022,55(01):133-140+144.DOI:10.16154/j.cnki.cn22-1025/c.2022.01.016.
- [8] Guo Jun. The value and role of performance management in enterprise development - an example of Group C's performance management practice [J]. China General Accountant,2017(07):100-102.
- [9] Chen Zichao. Research on the relationship between government subsidies, innovation investment and firm performance [D]. Jiangsu University, 2020. DOI:10.27170/d.cnki.gjsuu.2020.001352.
- [10] Hu Weimin. Research on the impact of executive-employee pay gap on firm performance [D]. Guilin University of Electronic Science and Technology, 2021.

Appendix

Interview Notes

Table 6. Group 1

Interview date: 25 January 2021	Interview location: respective homes
Interviewer: Manager Zheng, Guangzhou	Recorded by: Cheng Kai Yee
Interview: WeChat	
Interview topic: The impact of Intra-firm pay gap and external government subsidies on corporate performance - an example from the pharmaceutical industry in Guangdong Province	
Transcript of interview.	
<p>1. Do you think that external government subsidies and internal pay gaps have an impact on the performance of a company's R&D staff in a pharmaceutical company? If so, do they have a positive or negative impact?</p> <p>A: Yes, external government subsidies have a positive impact on the R&D staff of a company, which can have an incentive effect and improve the efficiency of the company's R&D. The internal pay gap has a negative impact on R&D personnel, and the company's R&D receives the impact of the company's pay gap, which affects the company's R&D investment policy.</p>	

2. What aspects do you think can measure the performance of the company? For example, the company's financial performance, R&D performance, etc. What specific aspects can be measured through financial statements or the company's annual report?

Answer: operating margin, cost/expense ratio, return on net assets, return on total assets, return on capital, etc.

3. The results of our data survey found that there is a correlation between gearing and pay gap, what do you think is the relationship between them? In addition, there is a correlation between the size of the company and the number of professional applications, what do you think is the relationship between them?

Answer: The higher the gearing ratio, the lower the pay gap. The larger the company, the higher the number of applications for the profession.

4. We turned out to find that government subsidies affect the performance of companies more than the pay gap. What do you think are the possible reasons for this?

Answer: Companies give high salaries to executives, but there is a lack of monitoring mechanisms within the company, in which case the high salaries can become a tool for executives to seek personal gain. Generally government grants can be counted as income outside the business of the company, which can increase the profits and assets of the company in a short period of time and can be a performance indicator for the management of the company in terms of remuneration.

5. As a staff member in the pharmaceutical industry, which variable are you more sensitive to changes in external government input or the pay gap within your company? If it is convenient, please share the reasons why (sensitive in the sense that the information is received more quickly and there is a greater change in mood after receiving the information)

Answer: I think that staff are more sensitive to the pay gap. This is because a high pay gap between employees can lead to feelings of inequality, which can lead to disruptive behaviour and reduce organisational effectiveness.

6. According to the results of the study, external incentives have a more significant impact on corporate performance. What other external incentives do you think can effectively improve the performance of pharmaceutical companies?

Answer: external investment, government policy regulation, external governance environment.

7. From your personal understanding, is the performance of staff in medical companies at home and abroad affected by government subsidies and pay disparities in a consistent manner? If there are deviations, what are the specific aspects?

Answer: No, it is not consistent. There are huge differences in the level of corporate governance, related policies and regulatory efforts at home and abroad.

8. How has your company's operating income changed in the context of the new crown epidemic? Are the salaries and incomes of executives and general staff affected by it? If so, what is the magnitude and direction of the change?

A: In fact, under the background of the new epidemic in 20 years, the company's operating income has increased rather than decreased, and since then it has been in a relatively substantial state, and staff salaries have not been affected.

9. Does your company receive any government subsidies? Do you have an understanding of the differences in pay in your company?

Answer: Yes, there are, such as investment incentives and the like. I am aware of the company pay gap, our company's monthly salary range is divided from M1-M10 scale, but due to the large gap, we cannot disclose it to the public due to company policy.

Table 7. Group 2

Interview date: 26 January 2021	Interview location: respective homes
Interviewer: HR Manager, R&D position, Guangzhou	Recorder: Jiang Yutong Chen Yanlin
Interview: WeChat	
Interview topic: The impact of Intra-firm pay gap and external government subsidies on corporate performance - an example from the pharmaceutical industry in Guangdong Province	
Transcript of interview.	
<p>1. Do you think that external government subsidies and internal pay gaps have an impact on the performance of a company's R&D staff in a pharmaceutical company? If so, will they have a positive or negative impact?</p> <p>A: I think there will be a positive impact. There are government subsidies for R&D funding and subsidies for bringing in high tech talent, both of which will have a positive effect on R&D performance. The positive effect of the internal pay gap is more obvious, as higher salaries naturally motivate R&D staff.</p>	
<p>2. What aspects do you think can measure the performance of the company? For example, the company's financial performance, R&D performance, etc. What specific aspects can be measured through financial statements or the company's annual report?</p> <p>Answer: There are many indicators that can be used to measure this, such as operating profit margin, return on assets, etc. But we have to focus on what stage the company is in and performance targets must be set according to the different stages of the company. Then in his R&D stage</p> <p>In the case of the first stage, the results of the research and development should be used as an indicator. Only after commercialisation do we start to talk about the financial indicators of the company, so the different stages are different.</p>	
<p>3. The results of our data survey found that there is a correlation between gearing and pay gap, what do you think is the relationship between them? In addition, there is a correlation between the size of the company and the number of patent applications, what do you think is the relationship between them?</p> <p>Answer: I don't think the correlation between gearing and pay gap is obvious, but if you think about it, you can see that the higher the gearing, the smaller the pay gap. The correlation between the size of the company and the number of patent applications is more obvious. If the company is large, it is likely to bring in more hi-tech talents, so the number of patent applications will naturally be higher.</p>	
<p>4. We found that government subsidies have a greater impact on business performance than the pay gap, what do you think are the possible reasons for this?</p> <p>Answer: Because perhaps you are targeting more research companies, for ordinary companies it should be the pay gap that is more motivating, but the government tends to give more subsidies to high-tech companies, and government support is particularly crucial on the way to high-tech companies, so I think the type of high-tech company is more likely to be the reason.</p>	
<p>5. As a member of the pharmaceutical industry, which variable are you more sensitive to changes in external government input or internal pay gaps? If it is convenient, please share the reasons (sensitive, meaning that the speed of receiving the information is faster and the emotional change after receiving the information is greater)</p> <p>Answer: For me personally, I would be more sensitive to salary because government input is really a drop in the bucket, and government input is very limited because government subsidies are probably more focused on a company, which has little impact on me personally. I think I am relatively sensitive to changes in my salary because it is related to my own development in the company.</p>	
<p>6. According to the results of the study, external incentives have a more significant impact on the performance of enterprises.</p> <p>Answer: I think the main external incentive is the government, the government's fiscal policy, monetary policy and so on.</p>	

7. From your personal understanding, is the performance of staff in medical companies at home and abroad affected by government subsidies and pay disparities in a consistent manner? If there are deviations, what are the specific aspects?

Answer: No, it is not consistent. There are significant differences in the overall macroeconomic context and in the degree of importance that governments attach to research-based companies. In addition, each country has a different system for managing basic remuneration.

8. Based on the results of our survey, if you were a key manager in your company, would you consider taking measures to motivate R&D staff to carry out R&D? (If so, what measures would be taken? If no, why?)

Answer: I think some of the R&D people are more concerned about their salary, but a larger part of the R&D people are more concerned about whether their research is adopted by the company, they have a scientific sentiment and want to work for the company and the country.

9. Has the government increased the company's R&D subsidies in the context of the new crown epidemic?

Answer: I think there is overall, although the extent of government R&D subsidies varies from place to place.

10. How has your company's operating income changed in the context of the new crown epidemic? Are the salaries of executives and general staff affected by it? If so, what is the magnitude and direction of change?

Answer: The new crown epidemic should be a great benefit to some testing companies, because the new crown testing, so their cash flow, business income will become very good, then they will also choose to do more research and development investment, or do some acquisitions, for staff income, should still be a regular or conventional, may be slightly better than the usual time, but It's not as if the impact of the epidemic will change significantly.

11. As a member of the pharmaceutical industry, which do you think is more important and effective in improving company performance, external government subsidies or reducing internal pay differences?

In Reply to.

The government subsidies are research investment subsidies and talent subsidies, but these are very difficult to apply for and are not universal, but if they are there, they can help a company a lot. The internal pay differential is something that I think needs to be weighed, because with a small differential, the incentive may not be as good, and with a large differential, people will work hard to get a higher salary.

12. Has your company received any government grants? Do you have an understanding of the pay differential in your company? Is this difference large or small?

Answer: The company has a government subsidy, but this government subsidy has a certain specific direction, and the pay gap of the company is also known.

Table 8. Group 3

Interview date: 25 December 2021	Interview location: respective homes
Interviewer: Mr. Huo, Human Resources Manager of a pharmaceutical company in the top 30 in Guangdong Province (Interviewee requested company anonymity)	Recorded by Zhou Zhiqing, Cao Yaxuan
Interview format: Tencent Conference	
Interview topic: The impact of Intra-firm pay gaps and external government grants on corporate performance	

1. Do you think that in a pharmaceutical company, the gap between external government subsidies and internal staff remuneration has an impact on the performance of the company's R&D staff? If so, is the impact positive or negative?

Answer: I believe that both external government subsidies and internal pay gaps have a positive impact. External government subsidies motivate R&D staff and increase efficiency, while internal pay gaps reinforce a competitive atmosphere for employees and increase motivation.

2. What aspects do you think can measure the performance of the company? For example, the company's financial performance, R&D performance, etc. What specific aspects can be measured through financial statements or the company's annual report?

Answer: It can be measured in several ways. One is solvency, which can be measured by current ratio, quick ratio, gearing ratio, etc. Another aspect is the analysis of operating capacity, which can be measured by accounts receivable turnover, total assets turnover, etc. Another aspect is the analysis of profitability, which can be analysed by the gross margin of a certain R&D business and the return on assets.

3. The results of our data survey found that there is a correlation between gearing and pay gap, what do you think is the relationship between them? In addition, there is a correlation between the size of the company and the number of professional applications, what do you think is the relationship between them?

Answer: In most cases, gearing and pay gap are negatively correlated. Business size and the number of professional applications are positively correlated.

4. We found that government subsidies have a greater impact on business performance than remuneration.

Answer: Government grants do improve the effectiveness of projects more than salaries, mainly because they are better implemented into projects, they are more transparent and there is follow-up monitoring, but increasing staff salaries may not always directly improve project revenue.

5. As a member of the pharmaceutical industry, which variable are you more sensitive to changes in external government input or internal pay gaps? (Sensitive in the sense of receiving this information more quickly and having a greater change in mood after receiving it)

Answer: As an employee, you are more sensitive to changes in pay. Government grants are generally invested in projects to reduce the cost of project expenditure but do not significantly increase my personal performance as a result, so the change for me personally is small compared to my salary.

6. According to the research results, external incentives have a more significant impact on the performance of the company. What other external incentives do you think can effectively improve the performance of pharmaceutical companies?

Answer: Government policy on pharmaceuticals, the attitude of shareholders towards our company. External demand, for example, is a factor that can be considered a more effective "enabler" of performance, and if there is a higher demand for one's products, it can drive performance. If a company is listed, positive stock market movements can also have a positive motivational impact on performance.

7. From your personal knowledge, is the performance of R&D staff in foreign and domestic medical companies affected by external government subsidies and internal staff salary disparity in a consistent manner? If there is any discrepancy, what are the specific aspects?

Answer: There will definitely be some deviations at home and abroad, because the healthcare systems at home and abroad are different and the demand for medical products is not the same. The performance of foreign medical companies is more or less influenced by the internal and external factors you have studied.

8. According to our survey results, if you were a key manager in your company, would you consider taking measures to motivate your R&D staff to carry out R&D? (If so, what measures would be taken? If no, why?)

Answer: This is definitely the case. If you want to remain competitive in the industry, keeping up with the times, innovation and research and development is an essential point, and the public will prefer newer and better products. I think the internal pay differential you are looking at is a good entry point to narrow down the pay differential for each department and each position, but of course, all pay decisions must be evaluated by performance, so that they are convincing. So, for some employees with R&D achievements, you can adopt the method of giving a moderate amount of bonus to serve as an incentive.

9. Has the government increased the company's R&D subsidies in the context of the new crown epidemic? If yes, is it considered that this move has increased the internal pay gap.

Answer: Yes, of course. In the context of the new epidemic, research and development is being stepped up on vaccines, nucleic acid testing reagents and health care products, and the country is putting so much emphasis on epidemic prevention and control that it is investing heavily in research and development. I'm not particularly sure if this will increase the internal pay gap, but I think the pay of internal staff has increased, and of course the workload has increased in the same way.

10. How does the company's operating income change in the context of the new crown epidemic? Are the salaries and incomes of executives and general staff affected by this? If so, what is the magnitude and direction of the change?

Answer: Personally, I understand that in the general context, pharmaceutical companies are growing revenue, internal executives, staff, all have a certain degree of promotion, but the overall magnitude is not particularly large, after all, in this environment, the global economy has a negative impact, even if the pharmaceutical industry is in a very important position, but also unlikely to have a particularly positive change.

11. As a member of the pharmaceutical industry, which do you think is more important and effective in improving company performance, external government subsidies or reducing internal pay differences?

Answer: I think that external government grants would probably be a little more important and effective. Because domestic pharmaceutical companies are predominantly small to medium sized, most of them have insignificant internal pay differences, and these smaller differences don't really have a very significant impact on corporate performance. Government subsidies, on the other hand, are tangible and their effect will be more prominent.

12. Has your company received any government grants? Do you have any knowledge of the pay differential in your company? Is this difference large or small?

Answer: Yes, there is, in the context of the new crown, the government has provided funding to help the medical industry to step up research and development and production. Because the company I work for is not a large enterprise, the differences in internal salaries are relatively obvious. As far as I know, the differences in salaries in our company are not particularly large, staff salaries are assessed according to individual performance levels, the ratio of salaries at the supervisory level to salaries at the river staff level are relatively reasonable, bonuses also have a prescribed system of extraction percentages, and the overall differences are not large.