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The Impact of Performance Expectation Gap on Enterprise Innovation Performance ——Mediating Effect Test Based on Outco Me Control

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Abstract: Whether an enterprise can realize its innovation transformation through internal control is increasingly related to the survival of the enterprise. Based on the performance feedback theory and the internal control paradox, this paper explores the impact of the performance expectation deficit on the innovation performance of enterprises, introduces the negative intermediary of result control to reveal the specific impact path of the performance expectation deficit on the innovation performance of enterprises, and deeply analyzes the impact of internal and external social responsibility on both. Through in-depth analysis of manufacturing enterprises, it is found that the performance expectation deficit has a positive impact on enterprise innovation performance; The performance expectation deficit can improve the innovation performance of enterprises by inhibiting rigid management and hindering the result control of innovation; Compared with the performance of external social responsibility, the performance of internal social responsibility can significantly strengthen the impact on enterprise innovation performance. The research conclusion of this paper enriches the pre research of enterprise innovation performance, reveals the negative mediating effect of result oriented internal control, and provides a theoretical basis for the diversified collaborative strategy that enterprises should focus on fulfilling their internal social responsibility when facing the performance expectation deficit.

Keywords: Performance Expectation Deficit; Enterprise Innovation Performance; Internal Control; Result Control; Corporate Social Responsibility

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1.Introduction

In the context of the global scientific and technological revolution, scientific and technological innovation has become a key area of international competition. China's "14th five years plan" and the central economic work conference in 2023 clearly pointed out that scientific and technological innovation is the core, enterprises are the main body, and high-quality innovation resources are gathered [1] As the pillar of China's economic development, the innovation performance of a considerable number of enterprises is still low, and the gap between enterprises' innovation performance continues to expand [2]. Innovation is the only way for manufacturing enterprises with performance expectation deficit to realize the reversal against the wind. It is also more realistic to study the promotion effect of performance expectation deficit on enterprise innovation performance. However, when the performance expectation deficit of enterprises is large, the obstacles to innovation will also be large,

especially when the internal control management system of enterprises tends to result control, which will further increase the resistance to enterprise innovation.

As far as manufacturing enterprises are concerned, the evaluation method of internal control is mainly designed based on the achievement of the five major goals of internal control strategy, operation status, accuracy of financial reports, compliance with laws and regulations and asset security [3]. The internal control measured by this method is actually more focused on result control, which will stifle the management of enterprises and hinder the innovation intention of enterprises, which is not conducive to the improvement of enterprise innovation performance. Existing research shows that the main resistance of enterprises in the implementation of innovation is the obsolescence and fossilization of ideas, resources and management caused by internal result control, which is the "paradox of internal control". The hypothesis asserts that the institutionalized internal control mechanism is bound to lead to a certain degree of management rigidification, which inevitably conflicts with the flexibility required for the investment, integration and absorption of innovation activities, thus inhibiting the innovation of enterprises [4]. Therefore, in order to study how manufacturing enterprises break through the internal rigidity and resistance in the performance expectation deficit and improve the innovation performance, it is necessary to introduce the result control between the performance expectation deficit and enterprise innovation performance to explore its negative mediation mechanism, and also provide a basic analysis framework for further exploring under what circumstances the resistance can be effectively reduced.

Further analysis found that enterprises often face the risk of high initial investment, long cycle and uncertain results when implementing innovation [5], so external resources are needed to help enterprises implement innovation. Research shows that enterprises actively fulfill their internal and external social responsibilities, can effectively meet the needs of internal and external stakeholders, promote the establishment of good relations between enterprises and stakeholders, and provide rich resource support for technological innovation activities [6]. At the same time, for enterprises whose result control hinders technological innovation, such external assistance is more needed to increase the flexibility of their internal management. Therefore, this study also needs to explore whether and how corporate social responsibility can strengthen the inhibitory effect of the performance expectation deficit on the result control of the promotion mechanism, which is of great significance to promote the development of enterprise innovation and ultimately realize the dual benefits of economy and environment in China at this stage.

Therefore, based on the performance expectations of listed manufacturing enterprises in China, this paper makes an empirical study on whether the performance expectation deficit can promote the innovation performance of enterprises, explores the negative mediating effect of the result control between the two, and further analyzes the moderating effect of the internal and external social responsibilities of enterprises on the impact of the performance expectation deficit on the innovation performance of enterprises, and weakens the negative mediating effect of the result control between the two. Based on the performance feedback theory and internal control theory, this paper enriches the pre research of enterprise innovation performance, and supplements the research on the impact mechanism of performance expectation deficit on enterprise innovation performance from the perspective of internal control paradox; At the same time, it explores how manufacturing enterprises can effectively improve their innovation performance by cooperating with the appropriate performance of corporate social responsibility under the premise of performance expectation deficit, and alleviate the result control of enterprise innovation, so as to provide a scientific basis for enterprises to carry out innovation and social responsibility at the same time.

2.Research theory and hypothesis

2.1 Performance expectation deficit and enterprise innovation performance

Technological innovation is the key way for enterprises to maintain competitive advantage. Due to its high investment, long-term and uncertain return and other risk characteristics, enterprises tend to be cautious when deciding to implement innovation strategies. Although innovation activities contain technical and market risks, for enterprises with poor performance, even if the innovation fails, the resources they lose are relatively limited [7]. On the contrary, innovation strategy is regarded as a key means for enterprises to deal with existing performance challenges, correct inappropriate behavior

patterns, and stimulate operational vitality [8]. Wang Qian and others[9]believe that when an enterprise fails to achieve the expected performance, it will drive managers to search for problems, and the enterprise will increase R&D investment to obtain core competitiveness through technological innovation. Based on the performance feedback theory, when the enterprise is in the performance expectation deficit, it means that the enterprise's first practice has not achieved the desired effect. At this time, managers are motivated to search for innovation opportunities [10], conduct in-depth analysis on the reasons why the enterprise fails to achieve the expected goals, and explore the corresponding solutions[11], that is, when the enterprise is faced with the performance expectation deficit, it will be more motivated to engage in enterprise innovation.

Based on the research background of manufacturing industry, this paper finds that manufacturing enterprises can promote the improvement of enterprise innovation performance when facing the performance expectation deficit. First of all, under the current background of innovation and transformation, the managers of manufacturing enterprises are more inclined to adopt the long-term strategy of innovation because of their strong motivation and willingness to change. Secondly, in the process of innovation and transformation of manufacturing enterprises, the performance expectation deficit is only temporary and will not change the long-term enterprise innovation and transformation strategy. Finally, in the process of implementing innovation activities, enterprises often need sufficient resources as support. At this time, the redundant resources reserved within the enterprise can significantly alleviate the problem of resource constraints, thus promoting enterprises to increase R&D investment [12]. Manufacturing enterprises usually have abundant redundant resources, which provide necessary material and capacity support for their innovation and transformation.

Therefore, based on the above research and analysis, this paper puts forward the following assumptions:

H1: The performance expectation deficit of manufacturing enterprises is positively promoting the improvement of enterprise innovation performance.

2.2 The Mediating Effect of performance expectation deficit and result control in enterprise innovation performance

Based on the above research findings, the larger the performance expectation deficit, the more unfavorable it is for the improvement of the quality of enterprise result control, and the enterprise will conduct "problem search". At this time, the enterprise tends to think that the current conventional practices of the organization can not effectively respond to the changes in the external environment, so when facing the performance expectation deficit, the enterprise will promote the enterprise to carry out in-depth strategic reflection and change. However, enterprises that frequently make strategic adjustments will further reduce the overall quality of internal control [13]. Therefore, when an enterprise is faced with a small performance expectation deficit, the quality of its internal control biased towards result control is often high. In this case, the internal control system, as the management framework of the enterprise, shows the characteristics of stability and standardization, but it also means that there is a certain degree of rigidity.

The current research on the impact of performance expectation deficit on enterprise innovation performance expectation, enterprises will actively seek change, so as to optimize the internal control mechanism. However, internal control is a specific policy that is based on the constraints of the management system and penetrates into all levels of the company. There will inevitably be a certain conflict between its inherent standard and the flexibility required for innovation investment activities[14]. It is found that process control supports the view of "internal control promotion theory", while result control supports the view of "internal control paradox". As a traditional industry, the management rules and financial evaluation indicators implemented through internal control in the manufacturing industry reflect the internal control that is biased towards result control. At the same time, manufacturing enterprises usually pay more attention to the control and measurement of results due to the high investment and capital occupation in the early stage. In view of the fact that the overall average innovation investment level of China's listed companies is far lower than that of Companies in developed countries, for manufacturing enterprises, the "internal control paradox" plays a major role at this time, and enterprises' excessive reliance on the internal control management system that tends to control results may have a restrictive effect on the innovation performance of enterprises.

Through the above research and analysis, it can be found that the performance expectation deficit has a negative effect on the

result control, and the higher the result control is, the worse the improvement of enterprise innovation performance is. At the same time, the impact of performance expectation deficit on enterprise innovation performance is not direct, but indirectly through result control, and result control plays a negative intermediary role between the two. The performance expectation deficit stimulates the innovation vitality of enterprises by weakening the result control. However, it is a pity that there are few negative studies on the effect control of performance expectation deficit, and the effect control hinders the improvement of enterprise innovation performance.

Therefore, this paper proposes the following assumptions to verify this conclusion:

H2: Result control plays a negative intermediary role between performance expectation deficit and enterprise innovation performance.

2.3 The moderating effect of corporate social responsibility on performance expectation deficit and corporate innovation performance

As an important strategic concept, corporate social responsibility (CSR) has attracted much attention in business and academia for a long time. The performance expectation deficit of enterprises can promote the innovation performance of enterprises [15], but this promotion also requires enterprises to obtain external resources, and enterprises' active performance of social responsibility can bring these external resources to enterprises. According to the stakeholder theory, enterprises can adopt positive strategies to practice corporate social responsibility, so as to attract and win the attention and support of various stakeholders, and then effectively obtain the economic and social resources provided by these stakeholders [16], so as to provide resources for enterprises to carry out innovation. In the context of increasingly fierce competition, enterprises in the process of promoting innovation will inevitably face the challenge of taking into account all aspects of corporate social responsibility, so the choice between external and internal social responsibility is particularly critical. The study found that when enterprises actively fulfill their internal social responsibilities, they will show the following aspects: stimulate the innovation enthusiasm of internal employees, and then improve the R&D efficiency of enterprises [17]; Enhance the confidence of shareholders. Urge shareholders to add capital to the enterprise's product research and development; Improve the quality of innovative products and services; Good relationship with suppliers. However, some studies have found that enterprises' excessive undertaking of external social responsibility will not only consume a large amount of enterprise resources, but also seriously disperse the focus and energy of enterprises in innovation activities, and easily lead to enterprises' deep involvement in complex relationships with external stakeholders. Therefore, compared with the external social responsibility and the internal social responsibility, it can be found that when facing the performance expectation deficit, it is more effective for enterprises to actively fulfill the internal social responsibility than the external social responsibility.

Many scholars pointed out that enterprises' active performance of social responsibility will help them obtain unique and valuable professional knowledge and skill resources from external stakeholders. These precious resources can be further used to enrich and expand the knowledge system within the enterprise [18], so as to ease the rigidity of internal management, increase flexibility, and make internal control more inclined to process control rather than result control. From the above research, it can be found that result control will hinder the innovation of manufacturing enterprises, but enterprises can loosen the original traditional and more fixed concept of result control by actively performing their external social responsibilities and introducing some external resources.

Therefore, based on the above research and analysis, this paper puts forward the following assumptions:

H3: Corporate social responsibility positively moderates the impact of performance expectation deficit on corporate innovation performance;

H4: Compared with external corporate social responsibility, internal corporate social responsibility more positively moderates the impact of performance expectation deficit on innovation performance;

H5: Corporate internal and external social responsibilities further strengthen the inhibitory effect of performance expectation deficit on result control.

3.Research design

3.1 Model construction

In order to test the previous research hypothesis H1 to H5, this paper constructs the following model for analysis:

To verify H1, the following model was built:

$R\&D=\alpha_0+\alpha_1 GAP+\alpha_2 LIFE+\alpha_3 STA+\alpha_4 REVENUE+\alpha_5 SIZE+\alpha_6 ER$

To validate H2, the following model was built:

$GAP=\alpha_0+\alpha_1 IC+\alpha_2 LIFE+\alpha_3 STA+\alpha_4 REVENUE+\alpha^5 SIZE+\alpha_6 ER$

$IC=\alpha_0+\alpha_1 R\&D+\alpha_2 LIFE+\alpha_3 STA+\alpha_4 REVENUE+\alpha_5 SIZE+\alpha_6 ER$

$R\&D=\alpha_0+\alpha_1 GAP+\alpha_2 IC+\alpha_3 LIFE+\alpha_4 STA+\alpha_5 REVENUE+\alpha_6 SIZE+\alpha_7 ER$

To verify H3, the following models were built:

$R\&D=\alpha_0+\alpha_1 GAP+\alpha_2 CSR+\alpha_3 C\_GAP*C\_CSR+\alpha_4 LIFE+\alpha_5 STA+\alpha_6 REVENUE+\alpha_7 SIZE+\alpha_8 ER$

To validate H4, the following models were built:

$R\&D=\alpha_0+\alpha_1 GAP+\alpha_2 CSRN+\alpha_3 C\_GAP*C\_CSRN+\alpha_4 LIFE+\alpha_5 STA+\alpha_6 REVENUE+\alpha_7 SIZE+\alpha_8 ER$

$R\&D=\alpha_0+\alpha_1 GAP+\alpha_2 CSRW+\alpha_3 C\_GAP*C\_CSRW+\alpha_4 LIFE+\alpha_5 STA+\alpha_6 REVENUE+\alpha_7 SIZE+\alpha_8 ER$

To verify H5, the following models were built:

$IC=\alpha_0+\alpha_1 GAP+\alpha_2 CSR+\alpha_3 C\_GAP*C\_CSR+\alpha_4 LIFE+\alpha_5 STA+\alpha_6 REVENUE+\alpha_7 SIZE+\alpha_8 ER$

$IC=\alpha_0+\alpha_1 GAP+\alpha_2 CSRN+\alpha_3 C\_GAP*C\_CSRN+\alpha_4 LIFE+\alpha_5 STA+\alpha_6 REVENUE+\alpha_7 SIZE+\alpha_8 ER$

$IC=\alpha_0+\alpha_1 GAP+\alpha_2 CSRW+\alpha_3 C\_GAP*C\_CSRW+\alpha_4 LIFE+\alpha_5 STA+\alpha_6 REVENUE+\alpha_7 SIZE+\alpha 8 ER$

3.2 Variable selection and description

Explained variable: enterprise innovation performance (r&d). We use r&d investment as an indicator to measure the innovation performance of enterprises, and use the method of Li Yingmei [19]and others to measure the ratio of R&D investment to operating income (r&d).

Explanatory variable: performance expectation deficit (GAP). The explanatory variable of this paper is the gap between actual performance and expected performance (P-A) when the enterprise fails to achieve the expected performance of the organization. P is measured by the rate of return on total assets (ROA). A is the expected performance calculated based on the linear combination of historical and social expected performance. This paper uses the research of Wang Jing [9]for reference to measure. The specific calculation formula is:

$$A_{i,t}=a_1 HA_{i,t}+(1-a_1)SA_{i,t}$$

Among them, ha is the historical expected performance of company I, which is measured by the return on total assets of company I in T-1 year; SA is the average return on total assets of companies other than company I in the industry where company I is located in the T year. This paper uses the research of Wang Jing [9]for reference, and takes A1 as 0.5 for calculation.

Intermediate variable: result control (IC). Select "Dibo · internal control index of Listed Companies in China", which is designed based on the realization of the five major objectives of internal control compliance, reporting, asset safety, operation and strategy. Based on the design of the index, it can be found that the measurement of internal control is more focused on result control.

Moderating variable: corporate social responsibility (CSR). The total score of the social responsibility report of listed companies released by Hexun is used as the standard to measure the performance of corporate social responsibility.

Referring to the existing research, this paper mainly controls the enterprise life, the number of employees, revenue, size and property right ratio.

3.3 Data sources

This study selected samples of A-share listed manufacturing companies from 2012 to 2021 for analysis, and sorted out the data obtained as follows: (1) eliminate ST listed companies; (2) Companies with a period or a missing indicator and an internal control index of 0 are excluded; (3) In the regulatory effect test, the explanatory variables and regulatory variables were decentralized, and 13551 sample observations were obtained. The descriptive statistics of the main variables involved in this paper are shown in Table 1.

Table 1 Definitions of major variables

Variable Name	Variable Meaning	Calculation Method
r&d	Enterprise innovation performance	R&D investment as a percentage of operating income
gap	Performance Expectation Deficit	(P-A)The higher the value, the greater the expected performance deficit of the enterprise
ic	Result control	The internal control index is added to 1 and then the natural logarithm is taken
csrn	Internal Corporate Social Responsibility	Shareholder Responsibility, Employee Responsibility, Supplier, Customer and Consumer Rights Responsibility
csrw	External Corporate Social Responsibility	Environmental Responsibility Social responsibility
life	Business life	The natural logarithm of the time of incorporation of the company
sta	Number of employees	The total number of employees in the current year is logarithmic
revenue	Main business income	The logarithm of the company's main business income
size	The size of the enterprise	Take the logarithm of the total assets at the end of the period
er	Equity ratio	Total Liabilities/Ownership Equity

4.Empirical results and analysis

4.1 Correlation analysis

Table 2 shows the regression results of the impact of performance expectation deficit on enterprise innovation performance. The coefficient of performance expectation deficit (GAP) is 0.656, and it is significantly positively correlated at the 1% level, indicating that the larger the performance expectation deficit, the more the promotion of enterprise innovation performance, that is, the performance expectation deficit has a positive impact on enterprise innovation performance, and H1 is established.

Table 2 Descriptive statistics of the full sample size

Variable Name	Mean	Standard Deviation	Minimum	Maximum
r&d	4.78	6.755	0	342.34
gap	0.005	0.562	-24.207	48.031
ic	6.189	1.34	0	6.886
csrn	16.966	9.829	-12.09	57.32
csrw	5.037	6.117	-15	38.42
life	2.824	0.337	1.099	3.97
sta	7.752	1.134	2.398	12.342
revenue	21.41	1.478	0	27.489
size	22.063	1.163	17.277	27.547
er	1.093	14.899	-340.171	1556.429

4.2 Mediating effect test

According to the traditional practice, we use the sequential regression test procedure to test the mediating effect of the result control. Table 3 reports the mediating effect of result control on the impact of performance expectation deficit on enterprise innovation performance. The (1) list shows that the performance expectation deficit has a significant negative impact on the result control, the (2) list shows that the result control has a significant negative impact on the enterprise innovation performance, and the (3) list shows that the performance expectation deficit has a significant positive impact on the enterprise innovation performance, which all meet the first three conditions of the intermediary test. At the same time, table (3) shows

that the estimated value of performance expectation deficit on enterprise innovation performance is significantly positive, which shows that the result control plays a partial intermediary role in the impact of performance expectation deficit on enterprise innovation performance. In general, when the enterprise is in the performance expectation deficit, it will reduce the inhibitory effect of result control on enterprise innovation performance, thus promoting the positive impact of enterprise on enterprise innovation performance in the case of performance expectation deficit. It verifies that result control plays a negative intermediary role between performance expectation deficit and enterprise innovation performance, and supports H2.

Table 3 The impact of performance expectation deficit on enterprise innovation performance

	(1)
	r&d
gap	0.656***
	(6.596)
life	-0.050
	(-0.293)
sta	-0.778***
	(-8.519)
revenue	-1.699***
	(-23.391)
size	1.667***
	(16.215)
er	0.001
	(0.361)
_cons	10.544***
	(7.518)
N	13551
R^2	0.076
F	184.425

***p<0.01, **p<0.05, *p<0.1

4.3 Test on the moderating effect of corporate social responsibility

As can be seen from table 4, columns (1) - (3) respectively test the regression effect of corporate social responsibility and performance expectation deficit, corporate internal social responsibility and performance expectation deficit, and corporate external social responsibility and performance expectation deficit on corporate innovation performance. Table (1) shows that the interaction coefficient of corporate social responsibility and performance expectation deficit is positive, and H3 is established through the significance level test. The data in columns (2) - (3) show that the interaction coefficient of corporate internal social responsibility and performance expectation deficit is positive and significant at 1%, while the interaction coefficient of corporate external social responsibility and performance expectation deficit is -0.031 and not significant at 1%. It can be seen that when corporate social responsibility positively regulates the impact of performance expectation deficit on corporate innovation performance, corporate internal social responsibility plays a major role, supporting H4.

As can be seen from table 4, columns (4) - (6) respectively test the regression effect of corporate social responsibility and performance expectation deficit, corporate internal social responsibility and performance expectation deficit, and corporate external social responsibility and performance expectation deficit to result control. Table (4) shows that the interaction coefficient of corporate social responsibility and performance expectation deficit is 0.022, which is significant at the level of 1%, indicating that corporate social responsibility enhances the inhibitory effect of performance expectation deficit on result control. Table (5) - (6) shows that the coefficient of the interaction between corporate internal social responsibility and performance expectation deficit is 0.029, while the coefficient of the interaction between corporate external social responsibility and performance expectation deficit is 0.052, which is significant at the level of 1%. It shows that both internal and external corporate social responsibility can strengthen the inhibitory effect of performance expectation deficit on result control. Support H5.

Table 4 Outcome control mediating effect test

	(1)	(2)	(3)
	ic	r&d	r&d
gap	-0.132***		0.638***
	(-6.516)		(6.409)
life	-0.441***	-0.103	-0.109
	(-12.792)	(-0.602)	(-0.641)
sta	0.111***	-0.740***	-0.763***
	(5.954)	(-8.090)	(-8.347)
revenue	0.116***	-1.682***	-1.684***
	(7.857)	(-23.075)	(-23.130)
size	-0.152***	1.615***	1.647***
	(-7.276)	(15.674)	(15.989)
er	-0.005***	0.001	0.001
	(-5.942)	(0.138)	(0.197)
ic		-0.150***	-0.135***
		(-3.565)	(-3.206)
_cons	7.454***	12.124***	11.553***
	(26.123)	(8.441)	(8.040)
N	13551	13551	13551
R^2	0.028	0.073	0.076
F	64.785	178.890	159.655

***p<0.01, **p<0.05, *p<0.1

4.4 Robustness test

The measurement of gap, the key explanatory variable, is based on the industry dimension to measure the level of performance expectations, and different information sources involved in the performance feedback of this dimension may lead to biased or inconsistent model estimation coefficients. Therefore, this paper draws lessons from the practice of xuyuandeng et al. (2022) [20], uses the return on total assets (ROA) of the sample enterprise in year t minus the return on total assets of the enterprise in year T-1, and the overall performance expectation is negative as the proxy variable (Gap1) of the performance expectation deficit. Again, the regression test is conducted on the main effect, and its control variables are consistent with the previous results. The regression results are shown in Table 5. It can be found that the coefficient of

the main effect of the proxy variable (Gap1) of the performance expectation deficit is 0.437, and the coefficient of the main effect of the performance expectation deficit is 0.656, which both pass the significance test, and the sign of the performance expectation deficit is basically the same as the previous results.Consistent, indicating that the research conclusion of this paper is robust.

Table 5 Moderating effect of corporate social responsibility

	(1)	(2)	(3)	(4)	(5)	(6)
	r&d	r&d	r&d	ic	ic	ic
gap	1.404***	1.785***	0.502***	0.387***	0.437***	0.107***
	(5.216)	(6.470)	(2.605)	(7.196)	(7.991)	(2.732)
csr	-0.011***			0.017***		
	(-2.855)			(21.213)		
c_gap*c_csr	0.034***			0.022***		
	(3.061)			(9.907)		
life	-0.107	-0.038	-0.139	-0.335***	-0.295***	-0.413***
	(-0.624)	(-0.219)	(-0.817)	(-9.797)	(-8.673)	(-11.988)
sta	-0.755***	-0.774***	-0.727***	0.088***	0.091***	0.100***
	(-8.252)	(-8.464)	(-7.934)	(4.804)	(5.037)	(5.402)
revenue	-1.671***	-1.692***	-1.671***	0.087***	0.075***	0.111***
	(-22.887)	(-23.149)	(-22.972)	(5.987)	(5.155)	(7.549)
size	1.642***	1.648***	1.656***	-0.151***	-0.147***	-0.157***
	(15.954)	(16.022)	(16.089)	(-7.321)	(-7.204)	(-7.534)
er	0.001	0.002	0.001	-0.004***	-0.004***	-0.004***
	(0.338)	(0.423)	(0.279)	(-5.511)	(-5.364)	(-5.853)
csrn		-0.000			0.031***	
		(-0.025)			(26.171)	
c_gap*c_csrn		0.062***			0.029***	
	(4.399)				(10.446)	
csrw			-0.063***			0.017***
			(-6.688)			(8.954)
c_gap*c_csrw			-0.031			0.052***
			(-0.840)			(7.003)
_cons	10.741***	10.769***	10.347***	7.550***	7.449***	7.586***
	(7.656)	(7.677)	(7.380)	(26.939)	(26.803)	(26.674)
N	13551	13551	13551	13551	13551	13551
R^2	0.077	0.077	0.079	0.064	0.079	0.037
F	140.832	140.934	144.398	115.836	145.739	64.668

***p<0.01, **p<0.05, *p<0.1

4.5 Heterogeneity test

The above model is used to further analyze the relationship between the performance expectation deficit of China's state-owned enterprises and non-state-owned enterprises, enterprises in the eastern region and enterprises in the central and western regions and enterprise innovation performance. The samples with missing values in property rights and regions are deleted, and the main effect is not affected by the test of the whole sample.

From the comparison between state-owned enterprises and non-state-owned enterprises in Table 6, it can be seen that the coefficient of performance expectation deficit of non-state-owned enterprises is 0.652, which is significant at the level of 1%. The results show that non-state-owned enterprises are more likely to drive enterprise innovation when facing the performance expectation deficit. The main reason is that non-state-owned enterprises face more fierce market competition and need to be responsible for their own profits and losses. Therefore, when facing the performance expectation deficit, non-state-owned enterprises have a stronger sense of innovation to improve the innovation performance of enterprises, so as to reverse the decline.

Table 6 Robustness test

	(1)	(2)
	r&d	r&d
gap1	0.437***	
	(5.500)	
life	-0.037	-0.050
	(-0.220)	(-0.293)
sta	-0.779***	-0.778***
	(-8.517)	(-8.519)
revenue	-1.707***	-1.699***
	(-23.482)	(-23.391)
size	1.669***	1.667***
	(16.216)	(16.215)
er	0.001	0.001
	(0.377)	(0.361)
gap		0.656***
		(6.596)
_cons	10.637***	10.544***
	(7.581)	(7.518)
N	13551	13551
R^2	0.075	0.076
F	182.043	184.425

***p<0.01, **p<0.05, *p<0.1

Comparing the correlation coefficients between the eastern region and the central and western regions in Table 7, it can be found that the coefficient of the eastern region is 0.999, which is much higher than that of the central and western regions by

0.654. Combined with the current domestic development, we can find the following reasons: first, enterprises in the eastern region have formed a relatively perfect industrial system and industrial chain, which provide strong industrial support for local enterprises to carry out innovation; Secondly, there are many universities, scientific research institutions and innovative enterprises in the eastern region, which provide technical support for enterprises in the eastern region to carry out innovation, making enterprises in the eastern region more advantageous in technological innovation; Third, the geographical position of the eastern region is relatively superior, which is convenient to integrate with the international market, absorb foreign advanced technology and management experience, and the eastern region government also provides more preferential policy support for enterprises, which is more conducive to enterprises' innovation activities.

Table 7 Examination of property heterogeneity

	Full sample	**State-owned enterprises**	**Non-state-owned enterprises**
	rd	**rd**	**rd**
gap	0.656***	0.477	0.652***
	(6.596)	(1.022)	(5.895)
life	-0.050	-0.983***	0.381*
	(-0.293)	(-3.762)	(1.794)
sta	-0.778***	-0.340***	-0.876***
	(-8.519)	(-2.687)	(-7.511)
revenue	-1.699***	-1.912***	-1.624***
	(-23.391)	(-17.166)	(-18.096)
size	1.667***	1.845***	1.600***
	(16.215)	(13.117)	(11.835)
er	0.001	0.003	-0.012
	(0.361)	(1.106)	(-0.769)
_cons	10.544***	9.990***	10.115***
	(7.518)	(5.786)	(5.089)
N	13551	3929	9622
R^2	0.076	0.102	0.065
F	184.425	74.163	111.773

***p<0.01, **p<0.05, *p<0.1

4.6 Further analysis

When discussing the innovation activities of enterprises, we must face up to its long-term nature, high risk and many accompanying uncertainties. The mainstream research trend also tends to use the number of patent applications [21][22]to measure the innovation performance of enterprises. Therefore, this paper further uses the number of patent applications to measure the innovation performance of enterprises for regression analysis. Table 8 shows the enterprises' innovation performance (patents) measured by the number of patent applications, and makes regression effect test. The coefficient of performance expectation deficit (GAP) is 0.083, and it is significantly positively correlated at the level of 10%, indicating that the larger the performance expectation deficit is, the more conducive it is to improve the number of patent applications of enterprises and promote the improvement of innovation performance of enterprises. Once again, H1 is verified to be true.

Table 8 Regional heterogeneity test

	Full sample	Eastern region	Midwest
	rd	rd	rd
gap	0.656***	0.983***	0.638***
	(6.596)	(3.989)	(4.131)
life	-0.050	-0.581***	1.771***
	(-0.293)	(-4.387)	(3.473)
sta	-0.778***	-0.480***	-1.518***
	(-8.519)	(-6.509)	(-6.018)
revenue	-1.699***	-1.561***	-1.924***
	(-23.391)	(-25.106)	(-10.764)
size	1.667***	1.505***	2.023***
	(16.215)	(17.397)	(7.775)
er	0.001	-0.007	0.001
	(0.361)	(-0.683)	(0.245)
_cons	10.544***	10.518***	7.724**
	(7.518)	(9.020)	(2.121)
N	13551	9440	4111
R^2	0.076	0.104	0.073
F	184.425	182.285	53.541

***p<0.01, **p<0.05, *p<0.1

5.Research conclusions and Prospects

Based on the performance feedback theory, internal control paradox and stakeholder theory, this study examines whether enterprises can improve their innovation performance when facing the performance expectation deficit, and finds that: (1) the larger the performance expectation deficit, the more conducive it is to improve their innovation performance. (2) The internal control of manufacturing enterprises tends to result control, so the performance expectation deficit can weaken the negative effect of result control on enterprise innovation performance by reducing the quality of result control. (3) Corporate social responsibility positively moderates the impact of performance expectation deficit on corporate innovation performance. Compared with corporate external social responsibility, corporate internal social responsibility plays a major role. (4) Corporate social responsibility positively moderates the impact of performance expectation deficit on result control. Compared with internal corporate social responsibility, external corporate social responsibility can strengthen the inhibitory effect of performance expectation deficit on result control. (5) When facing the performance expectation deficit, non-state-owned enterprises and enterprises in the eastern region have a stronger willingness to carry out innovation and improve enterprise innovation performance than state-owned enterprises and enterprises in the central and western regions.

The practical significance of this study for enterprises includes the following four aspects: (1) when facing the gap of performance expectations, enterprises should adhere to the thinking of change and take adversity as an opportunity to actively promote the innovation transformation and innovation development of enterprises. (2) When optimizing the internal control management system of enterprises, enterprises should pay attention to process control rather than simple result orientation,

so as to prevent the rigidity and rigidity of management mechanism. (3) For enterprises in performance adversity, they can perform their social responsibilities in a targeted way. Enterprises' active performance of internal social responsibilities can more effectively promote the improvement of enterprise innovation performance, absorb new and flexible management concepts and resources from the outside, and then optimize the result control management system, and finally promote the improvement of enterprise innovation ability through the innovation of internal control mechanism. (4) The government should reform the current management mode of state-owned enterprises to promote the innovation and development of state-owned enterprises, and should strengthen the investment and construction in the central and western regions, so as to promote the innovation and development process of enterprises in the region.

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