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The Impact of R&D Investment on Corporate Performance from the Perspective of Innovation Risk Prevention and Control

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Abstract

Research and development is an important factor for the sustainable development of enterprises, and the success of research and development investment can promote the growth of enterprise performance. The initial research data of Shanghai and Shenzhen A-share listed companies from 2012 to 2022 are selected as benchmark samples, and the regression method is adopted to study the impact of R&D input on enterprise performance. Furthermore, the regression method is applied to analyze the regulatory effect of innovation risk prevention and control on enterprise performance by adding the variables of enterprise R&D input after computing centralization and the interaction between enterprise innovation risk prevention and control. Finally, heterogeneity analysis was carried out. The conclusions are as follows: R&D investment can significantly promote the improvement of enterprise performance, and this conclusion is still valid after a series of tests; The moderating effect results show that innovation risk prevention and control is an important mechanism affecting enterprise performance; There are significant regional and property rights heterogeneity in the impact of R&D investment on firm performance. Based on this, it is suggested that enterprises should attach importance to their own R&D investment and carry out innovation risk prevention and control in the process of R&D.

Keywords

Research and Development Investment; Enterprise Performance; Innovative Risk Prevention and Control; Regulating Effect.

1. Introduction

“Encouraging enterprises to continue to increase investment in research and development, carry out research on key core technologies, and actively undertake major national science and technology projects in accordance with regulations in accordance with national strategic needs and industry development trends” has been an important direction for the development of Chinese enterprises in recent years. In the past few years, the amount of R&D investment by Chinese enterprises has continued to increase. From 2012 , China's research and development (R&D) funding was 726.26 billion, and in 2022 , the research and development funding (R&D) was 29,400 . Enterprise innovation has also been developed to a certain extent, and the country's Technology patents are also increasing, but China still cannot master some more difficult technologies and has to rely on related foreign technologies. Therefore, enterprises must further invest in reasonable R&D investment to achieve optimal utilization of R&D investment and accelerate the development of enterprises. The speed of innovation and conquering difficult science and technology. R&D investment is one of the key factors for enterprises to improve their innovation capabilities. In order to encourage enterprises to continue to invest in R&D, my country has implemented relevant tax law incentives to encourage enterprises to invest in R&D. At the same time, by increasing R&D investment, enterprises can have stronger technological R&D capabilities and innovation capabilities, thereby promoting the continuous upgrading of products and services to meet market demand

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[1] and enhance the competitiveness of enterprises; enterprises can promote the development of new products and market expansion. Through R&D investment, enterprises can continuously launch new products or improve existing products to meet consumer needs, expand new market areas, and increase sales revenue and market share; enterprises can help enterprises maintain their technological leadership, and technological development is changing with each passing day. , market competition is fierce, and R&D investment can help companies keep up with the pace of technological development, master new technologies and knowledge, and ensure that companies can maintain a competitive advantage in the industry. At the same time, R&D investment is also an important part of implementing the innovation-driven development strategy and building a world power in science and technology. Therefore, it is very meaningful to conduct research on the impact of corporate R&D investment on corporate performance.0

However, in the process of enterprise R&D, innovation often involves new technologies, markets and business models, which all have uncertainties and risks [2] . Affected by the complexity and changes of these factors, this may cause actual results to differ from expected results, thereby triggering the risk of loss of profits. Innovation risk specifically refers to the possibility that an enterprise may fail due to its inability to achieve expected results during the technological innovation process, resulting in huge losses. Therefore, innovation risk is an important challenge that enterprises must face when conducting innovation activities. Enterprises need to evaluate and prevent and control innovation risks to prevent potential losses and promote healthy and sustainable development. Therefore, this article studies the impact of corporate R&D investment on corporate performance, adding the important factor of innovation risk prevention and control factor.

To sum up, corporate R&D investment is very important to corporate performance. Through reasonable R&D investment strategies, companies can enhance innovation capabilities and competitiveness, promote product development and market expansion, maintain technological leadership, control costs and improve efficiency, and enhance brand value and corporate image, thereby achieving sustainable development and good performance. [3] . At the same time, enterprises need to comprehensively consider various factors when preventing and controlling corporate innovation risks, and take a variety of measures to comprehensively prevent risks. Through effective risk management and control, enterprises can reduce innovation risks and achieve sustained innovation and development. Therefore, this article studies the impact of R&D investment on enterprise performance from the perspective of innovation risk prevention and control.

2. Review

Our country vigorously promotes innovative development of enterprises. R&D investment is an important factor in enterprise innovation. Enterprise innovation and development are also accompanied by risks. Therefore, it is of great significance to explore the impact of R&D investment on enterprise performance from the perspective of innovation risk prevention and control. Regarding the impact of corporate R&D investment on corporate performance, there are already a number of research results related to this topic in the world. Most of these research results show that corporate R&D has a promoting effect on corporate performance, and the impact of corporate R&D on corporate performance has a lag and Cumulative effect. This shows that corporate R&D investment cannot immediately have a significant impact on corporate performance. After the company continues to make reasonable use of corporate R&D investment, corporate performance will gradually increase and change [4[4] . At the same time, enterprise R&D investment does not have a continuous impact on enterprise performance after being invested for only one year. Only continuous investment in R&D can have a more significant and continuous impact on enterprise performance. In these studies, some people use

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R&D investment as an indicator to measure corporate innovation. Through continuous empirical research, they conclude that some corporate performance can be improved in the short term, while long-term R&D investment can continuously improve the market competitiveness of the company. Promote the sustainable development of enterprises [5] (Zhu Naiping). Another group of scholars have concluded that the impact of corporate R&D investment on corporate performance is not a linear relationship, but a " U "-shaped relationship, that is, corporate R&D investment will not always be positively correlated with corporate performance. As time increases, corporate R&D The promotion effect of investment and corporate performance will continue to weaken or even be negatively correlated. Then, after certain internal management adjustments, corporate R&D investment will be positively correlated with corporate performance and play a promoting role [6] (Xu Zhi).

It can be seen from the current situation of sustainable development of enterprises that innovation is the new engine and driving force for enterprise performance growth and a key factor in the sustainable development of enterprises. However, there are certain risks in the enterprise R&D process. As early as 1934 , Schumpeter, the master of innovation theory, described the ubiquity of uncertainty and risk in technological innovation in his book "Economic Development Theory". In recent years, the number of studies on corporate innovation risks by scholars has been increasing. Domestic studies are more numerous than foreign studies, indicating that domestic scholars pay more attention to the research on risks existing in the corporate innovation process. These scholars found that in the early stages of scientific and technological research and development, enterprises will continue to invest a large amount of capital to introduce a large number of advanced talents and rare materials related to technology. Once the funds are not used rationally and the enterprise's R&D cannot be converted into patents, then the enterprise will Facing huge financial difficulties, which puts the company into bankruptcy [7] , the company faces huge innovation risks in the early stage of research and development. In addition to the company's research and development process, companies also face certain risks when they put the developed products into the market. If the results of enterprise research and development cannot meet the needs of market consumers, then it will be difficult for the products to be promoted to the market for sale. If they are not sold, they will not be able to make profits, and it will be difficult for the enterprise to survive and develop. Successful innovation brings a lot of benefits, but high returns are accompanied by high risks, so it is very important to further study the prevention and control of innovation risks.

To sum up, there are many studies in theory and reality on the impact of corporate R&D investment on corporate performance, and a large number of relevant conclusions have been drawn. However, few scholars and business managers have added the factor of corporate innovation risk prevention and control to the study of the impact of corporate R&D on corporate performance. Therefore, this article selected the initial research data of Shanghai and Shenzhen A -share listed companies from 2012 to 2022. , on the basis of the impact of corporate R&D on corporate performance, the important regulating variable of innovation risk prevention and control is added to further study the impact of R&D investment on corporate performance from the perspective of innovation risk prevention and control.

3. Research Hypotheses

3.1. R&D Investment and Corporate Performance

R&D investment refers to the material support provided by enterprises for innovation. Enterprise innovation can improve the market competitiveness of enterprises and thereby improve enterprise performance. Among them, enterprise R&D investment is an important indicator to measure enterprise innovation. Enterprise R&D investment mainly includes two

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conditions: R&D personnel and funds [8] . Introducing a large number of high-quality talents can improve the conversion success rate of enterprise R&D innovation and shorten the time of technology research and development, thus reducing the cost of enterprise innovation and increasing the operating cost of enterprises. The increase in capital investment can provide support for the materials needed for corporate research and development, thus promoting the smooth progress of corporate research and development. Therefore, sufficient investment in R&D can promote enterprises to innovate, and creating new products can attract more customers and obtain greater profits. Through innovation, enterprises can enhance their competitive advantages, expand market demand, reduce production costs, enhance employee creativity and improve the company's brand influence. Therefore, the following hypotheses are proposed:

H1: R&D investment can significantly improve corporate performance.

3.2. R&D Investment, Innovation Risk Prevention and Control and Corporate Performance

In the process of enterprise R&D, we should not only pay attention to the enterprise's R&D investment, but also consider the various risks that will arise during the enterprise's R&D process, and pay attention to the prevention and control of innovation risks [9] . Enterprise development is an enterprise activity aimed at profit . Technological innovation can enhance the strength of the enterprise , thereby improving the operating efficiency of the enterprise. However, there are certain risks in technological innovation for enterprises . If the technological innovation of an enterprise fails , the company will lose a large amount of capital , resulting in serious corporate debt . The new goods manufactured cannot offset the old debt , and the company cannot carry out production. The next product will cause the company to go bankrupt; at the same time, if the company fails to understand the market demand in advance, it will be difficult to sell the products it innovates and make profits, and the company will be in a bad situation of lack of funds. Innovation risk prevention and control refers to controlling the risks that may be caused in the innovation process in advance and reducing the losses that may be caused by innovation risks. Therefore, the following hypotheses are proposed:

H2: Innovation risk prevention and control can enhance the role of R&D investment in promoting corporate performance.

4. Design

4.1. Samples and Data

In a market environment stimulated by competition, the innovation ability of an enterprise has become an important factor in its survival and development. Therefore, this article will explore the impact of enterprise R&D investment on enterprise performance. In addition, there are risks in enterprise innovation, and innovation risks will cause serious damage to enterprise development. Therefore, on the basis of studying the impact of corporate R&D investment on corporate performance, this article studies the relationship between corporate R&D investment and corporate performance after adding innovation risk prevention and control factors. The company mainly studies the relationship between strategic investment and company performance. Therefore, this article selected the initial research data of Shanghai and Shenzhen A -share listed companies from 2012 to 2022 , and processed the financial data as follows : (1) ST and *ST companies have been eliminated ; (2) Detection from the total financial data For companies with serious missing values , delete their relevant financial data ; (2) Screen out companies with serious missing values from the total data, and delete their related data; this article finally screens out unbalanced panel data for analysis. The data in this article

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comes from CSMAR and Wind . winsor winsor processing is applied to the 1% and 99% quantiles of all continuous variables.

4.2. Variable Definition

1) Explained variable

The explained variable in this article is mainly corporate performance. Return on equity (ROE) is the percentage of net profit to average shareholders' equity . It is the percentage rate obtained by dividing the company's after-tax profit by its net assets . This indicator reflects the income level of shareholders' equity and can well represent the development of the enterprise. situation, so this article chooses return on equity (ROE) to evaluate the company's performance [10].

2) Explanatory variables

The explanatory variable is corporate R&D investment. The cornerstone of the company is innovation. Without this capability , the company will lose its main market advantage, and the company's growth needs to rely on the promotion of innovation . However, corporate innovation requires a certain amount of energy from the company, and the important factors are employees and capital investment. Enterprise R&D investment is a necessary condition for enterprises to achieve innovation. Enterprises that want to innovate must invest in R&D. At the same time, realizing R&D investment is the basis for starting the positive cycle of R&D. This article will use R&D investment expenses (R&D) to measure corporate R&D investment [11] .

3) Moderator

The adjusting variable is enterprise innovation risk prevention and control. Corporate innovation risk prevention and control adopts the comprehensive scoring grade of the professional evaluation system of corporate social responsibility reports of listed companies on Hexun.com, which is divided into five levels and used as an indicator to measure corporate innovation risk prevention and control. The first-level score is 90-100 , indicating that the company's innovation risk prevention and control is excellent; the second-level score is 80-90 , indicating that the company's innovation risk prevention and control is good; the third-level score is 70-80 , indicating that the company's innovation risk prevention and control is moderate; A fourth-level score of 60-70 indicates that the enterprise's innovation risk prevention and control is poor; a fifth-level score of below 60 indicates that the enterprise's innovation risk prevention and control is poor.

4) control variables

This article selects enterprise size, enterprise growth, enterprise debt ratio, number of first shareholdings, asset liquidity and enterprise age as control variables. The final selection of variables in this article is shown in the table below:

Table 1. Related variable definition table

Variable type	variable name	variable symbol	Measurement dimensions
Explained variable	Business Performance	ROE	Roe
Explanatory variables	R&D investment	R&D	R&D investment expenses
Moderator	Innovation risk prevention and control	IRC	Innovation risk prevention and control levels
control variables	Enterprise size	Size	Total assets of the enterprise
	Enterprise growth	Growth	total assets growth rate
	Assets and liabilities	Lev	Assets and liabilities
	Asset liquidity	LIQ	quick ratio
	Enterprise age	Age	Company establishment time
	First number of shares held	First	Number of shares held by the company’s first shareholder

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4.3. Descriptive Statistics

In order to further understand the data structure, descriptive statistics were performed on the category data and single product data after excluding outliers. The results are shown in the following table:

Table 2. Main variables descriptive statistics results table

variable	total amount	average value	median	standard deviation	minimum value	maximum value
ROE	27730	0.0620	0.0720	0.273	-1.568	0.769
R&D	27730	22.36	22.16	1.448	19.50	27.31
Size	27730	17.10	17.04	1.321	13.83	20.45
First	27730	19.02	18.93	1.099	16.78	22.08
Lev	27730	0.451	0.441	0.217	0.0560	0.959
Growth	27730	0.169	0.0900	0.492	-0.636	3.335
LIQ	27730	3.328	1.052	11.75	0.0600	100.9
Age	27730	11.37	11.51	6.802	1	27.12

The table above shows the descriptive statistical results of the main variables. From the table above, we can see that the average value of ROE is 0.062 , which is greater than 0 , indicating that the overall development of the company this year is good, and most of them are profitable. At the same time, the minimum value of ROE is -1.568 and the maximum value is 0.769 , indicating that some companies still have poor development and are in a state of loss; the average R&D value is relatively large, 22.36 , indicating that most companies attach great importance to innovation and invest heavily in R&D. The minimum value of R&D is 19.50 and the maximum value is 27.31 , which shows that although companies all attach importance to corporate innovation, the degree of emphasis varies greatly.

5. Model Design

In order to verify the hypothesis made above, we introduced a regression model to conduct an in-depth study of the impact of the company's R&D investment on the company's performance. After taking the company's risk prevention and control as the adjusting variable , we introduced a regression model Impact. The regression equation established in this article is as follows: The regression equation established in this article is as follows:

$$ROE_{i,t} = \alpha_0 + \alpha_1 R\&D_{i,t} + \alpha_2 \sum Controls + \gamma_t + \eta_j + \varepsilon_{i,t}$$

$$ROE_{i,t} = \beta_0 + \beta_1 R\&D_{i,t} + \beta_2 + \beta_3 IRC_{i,t} * R\&D_{i,t} + \beta_4 \sum Controls + \gamma_t + \eta_j + \varepsilon_{i,t}$$

In the above formula, represents corporate performance; represents corporate R&D investment; is the control variable, including corporate size (Size), corporate growth (Growth) , corporate debt ratio (Lev), asset liquidity (LIQ) and corporate age (Age)); represents the residual term; this data is panel data. In order to control the impact of company type and time, this article controls the fixed effects of time and company individuals. ROE $R\&D$ $Controls$ ε .

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6. Empirical Analysis

6.1. Multicollinearity Test

In order to investigate whether there is a linear correlation between variables, which would lead to errors in the research results, a multicollinearity test was conducted on the main variables of this article. The test results are as follows:

Table 3. Multicollinearity test

variable	VIF	1/VIF
R&D	3.180	0.314
First	2.760	0.362
Lev	1.280	0.783
Growth	1	0.996
Size	1	0.997
Age	1	0.999
LIQ	1	0.999
	1	0.997
Mean	VIF	1.600

From the table above, we can see that the VIF values of corporate performance and the explanatory variables corporate R&D investment, the modulating variable innovation risk prevention and control, and each control variable are all less than 10, indicating that there is no serious multicollinearity in the regression results of all variables on corporate performance. .

After performing multicollinearity, the Hausman test was conducted on the data, and the results showed that the null hypothesis was strongly rejected (Prob>chi2=0.0000). This article uses fixed effects. Finally, to test the moderating effect of enterprise innovation risk prevention and control, the explanatory variables and adjusting variables were centralized, thereby reducing the impact of variable dimensions.

6.2. Baseline Regression

6.2.1. R&D Investment and Corporate Performance

A baseline regression is performed between the two variables of R&D investment and corporate performance. The regression results are as follows:

Column (1), column (2), column (3) and column (4) are respectively a control group. Column (1) shows that the two variables of corporate R&D investment and corporate performance are positively correlated at a significance of 0.01 . For every increase in corporate R&D investment by one unit, corporate performance increases by 0.0325 units, indicating that corporate R&D investment can promote corporate performance. Function, hypothesis 1 is confirmed; column (2) group adds the asset-liability ratio variable on the basis of column (1) group. The results show that the two variables of corporate R&D investment and corporate performance are negatively correlated at a significance of 0.01 . Corporate R&D For every unit increase in investment, corporate performance decreases by 0.0682 units; column (3) group adds three variables: corporate size, corporate growth and number of first shareholdings on the basis of column (2) group. The results show that corporate R&D investment is related to The two variables of corporate performance are positively correlated at a significance level of 0.01 . For every unit increase in corporate R&D investment, corporate performance increases by 0.0847 units; Group (4) adds asset liquidity and Regarding the two variables of enterprise age, the results show that the two variables of enterprise R&D investment and enterprise performance

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are positively correlated at a significance of 0.01 . For every one unit increase in enterprise R&D investment, enterprise performance increases by 0.0847 units.

Table 4. Baseline regression analysis

	(1)	(2)	(3)	(4)
	ROE	ROE	ROE	ROE
R&D	0.0325 ***	0.0682 ***	0.0847 ***	0.0847 ***
	(13.03)	(23.52)	(19.02)	(19.04)
Lev		-0.500 ***	-0.531 ***	-0.531 ***
		(-29.09)	(-29.00)	(-29.01)
Size			-0.00318 *	-0.00315 *
			(-1.89)	(-1.88)
First			-0.0250 ***	-0.0251 ***
			(-5.94)	(-5.96)
Growth			0.0940 ***	0.0940 ***
			(20.03)	(20.03)
LIQ				0.00264 *
				(1.84)
Age				0.00864 *
				(0.22)
YearFE	YES	YES	YES	YES
CompanyFE	YES	YES	YES	YES
_cons	-0.667 ***	-1.240 ***	-1.190 ***	-1.191 ***
	(-11.93)	(-20.30)	(-16.89)	(-16.87)
AjustedR ^{2}	0.653	0.559	0.622	0.634

Note: (1) The t values of the corresponding coefficients are in brackets ; (2) * p <0.1, ** p <0.05, *** p <0.01.

At the same time , the regression results between the control variables added in column (2), column (3) and column (4) and the explained variables are not much different. The two variables of asset-liability ratio and corporate performance are negatively correlated at the significance of 0.01 . For every unit increase in the asset-liability ratio, corporate performance decreases by 0.531 units; the two variables of corporate size and corporate performance are negative at the significance of 0.1 . Correlated, for every unit increase in enterprise size, enterprise performance decreases by 0.00315 units; the two variables of the first shareholding number and enterprise performance are negatively correlated at a significance level of 0.001 . For every unit increase in the first shareholding number, enterprise performance decreases. 0.025 units; the two variables of corporate growth and corporate performance are positively correlated at a significance of 0.001 . For every increase in the number of first shareholdings by one unit, corporate performance increases by 0.094 units; the two variables of asset liquidity and corporate performance are at 0.1 There is a positive correlation under the significance of 0.1. For every unit increase in asset liquidity, corporate performance increases by 0.00264 units;

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the two variables of corporate age and corporate performance are positively correlated under the significance of 0.1 . When corporate age increases by one unit, corporate performance increases by 0.00864 units.

6.2.2. R&D Investment, Innovation Risk Prevention and Control and Corporate Performance

To further study the moderating effect of corporate innovation risk prevention and control on corporate R&D investment and corporate performance, the research results are as follows:

Table 5. Regression analysis of the moderating effect of enterprise innovation risk prevention and control

	(1)	(2)	(3)
	ROE	ROE	ROE
IRC	0.0399 ***		0.0312 ***
	(6.34)		(6.30)
R&D		0.0847 ***	0.0836 ***
		(19.04)	(18.64)
IRC *R&D			0.00203 ***
			(3.68)
Lev	-0.418 ***	-0.531 ***	-0.410 ***
	(-23.40)	(-29.01)	(-23.16)
Size	-0.00297 *	-0.00315 *	-0.00309 *
	(1.63)	(1.88)	(1.69)
First	-0.0466 ***	-0.0251 ***	-0.0497 ***
	(14.70)	(-5.96)	(15.66)
Growth	0.103 ***	0.0940 ***	0.103 ***
	(20.80)	(20.03)	(20.67)
LIQ	0.00211 *	0.00264 *	0.00205 *
	(1.46)	(1.84)	(1.43)
Age	0.00541 *	0.00864 *	0.00115 *
	(0.13)	(0.22)	(0.27)
YearFE	YES	YES	YES
CompanyFE	YES	YES	YES
_cons	-0.653 ***	-1.191 ***	-0.746 ***
	(-9.48)	(-16.87)	(-10.99)
AjustedR ^{2}	0.632	0.621	0.633

Note: (1) The t values of the corresponding coefficients are in brackets ; (2) * p <0.1, ** p <0.05, *** p <0.01.

Column (1), column (2) and column (3) are each a control group. Column (1) shows that corporate innovation risk prevention and control and corporate performance are positively correlated at a significance level of 0.01 . For every increase in corporate R&D investment by one unit, corporate performance increases by 0.0399 units . Column (2) shows that corporate R&D investment and The two variables of corporate performance are positively correlated at a significance level of 0.01 . For every one unit increase in corporate R&D investment, corporate performance increases by 0.0874 units, indicating that corporate R&D investment can promote corporate performance. Column (3) adds the cross-term of corporate innovation risk prevention and control and corporate R&D investment on the basis of column (1) and column (2). The cross-line shows a significance of 0.01 . The cross-term is positively related to

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corporate performance. For every unit increase in the item, corporate performance increases by 0.00203 units, indicating that innovation risk prevention and control can enhance the role of R&D investment in corporate performance, confirming hypothesis 2.

6.3. Endogeneity Test

Endogeneity testing can help researchers determine the causal relationship between variables. This article has selected multiple control variables to avoid bias caused by omitted variables. In order to further study whether there is a bias due to the measurement of explanatory variables, this article selects R&D investment lag by one period as an instrumental variable [14] and conducts a two-stage [14] . The least squares method was used to test the endogeneity of the model. The R&D investment variable may lag for a period of time before it has an impact on corporate performance due to the economic cycle. Therefore, this article selects R&D investment lagged by one period as the instrumental variable. At the same time, selecting R&D investment lagged by one period as an instrumental variable can better reflect the dynamic adjustment of variables and better observe the impact of an increase in R&D investment on corporate performance; it can also reduce the impact of model autocorrelation and improve the accuracy of the model. Compatibility. The endogeneity test results are as follows:

Table 6. Two-stage least squares analysis

	(1)	(2)
	The first stage	second stage
VARIABLES	R&D	ROE
L.R &D	0.9783***	
	(0.001)	
R&D		0.0252***
		(0.001)
YearFE	YES	YES
CompanyFE	YES	YES
Constant	0.5986***	0.5110***
	(0.031)	(0.029)
First stage F value	5067.16	
DWH Inspection Chi ^{2}	1.371	
Observations	24,068	24,068
R-squared	0.955	0.831

Note: (1) The t values of the corresponding coefficients are in brackets ; (2) * p <0.1, ** p <0.05, *** p <0.01.

As can be seen from the table above, the endogeneity results are basically consistent with the benchmark regression results above, and corporate R&D investment is positively correlated with corporate performance. At the same time, the significance of the DWH test is greater than 0.05 , which accepts the null hypothesis that there is no endogeneity between corporate R&D investment and corporate performance. Therefore, there is no endogeneity between corporate R&D investment and corporate performance. The F value in the first stage is 5067.16 , which is greater than the critical value at the 10% deviation level, so there is no weak instrumental variable problem.

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7. Conclusion and Countermeasures and Suggestions

7.1. Research Conclusion

Science and technology are the cornerstone of a country's strength, and innovation is the core force that promotes national progress. However, corporate innovation requires R&D investment, so it is very meaningful to study the impact of corporate R&D investment on corporate performance. In the current increasingly fierce domestic and foreign competitive environment and diversified market demands, companies can only continuously improve their competitiveness by closely following the pace of innovation. Past research has extensively explored the impact of corporate innovation on corporate performance [18] , but few scholars have paid attention to the certain risks associated with corporate innovation. For enterprises, achieving sustainable development requires not only focusing on investment in innovation factors, but also focusing on the prevention and control of enterprise innovation risks to improve the success rate of enterprise R&D innovation conversion and achieve mutual promotion between enterprise R&D investment and enterprise performance. This article uses Shanghai and Shenzhen A -share listed manufacturing companies from 2012 to 2022 as a sample to empirically study the intrinsic relationship between dynamic innovation capabilities, corporate innovation risk prevention and control, and corporate performance.

(1) Benchmark regression research: Benchmark regression research found that corporate investment is positively correlated with corporate performance at a significance level of 0.01, which shows that corporate R&D investment can effectively promote the improvement of corporate performance, and also shows that internal innovation activities within the company are closely related to corporate performance . Related. This conclusion still holds true after a series of robustness tests, endogeneity tests and other tests, which shows that corporate R&D investment has a close impact on corporate performance.

(2) Moderating effect research: The moderating effect adds the new factor innovation risk prevention and control to the study of the impact of corporate R&D investment on corporate performance. The study found that the alternating term of corporate innovation risk prevention and corporate R&D investment and corporate performance are significant at 0.01 There is a positive correlation below, which shows that the addition of corporate innovation risk prevention and control can strengthen the impact of corporate R&D investment on corporate performance, and proves that corporate innovation risk prevention and control can effectively improve the success rate of corporate R&D investment conversion, thereby promoting the improvement of corporate performance. Therefore, while paying attention to R&D investment, companies should also pay attention to the implementation of corporate innovation risk prevention and control. At the same time, this shows that the prevention and control of innovation risks by enterprises will not weaken their innovation capabilities or occupy R&D resources. On the contrary, it will help increase the intangible value of the enterprise to a certain extent and help the enterprise achieve better development.

To sum up, enterprises should realize that innovation is an important factor in improving competitiveness and achieving sustainable development. In addition to increasing investment in innovation, they should also pay attention to the prevention and control of enterprise innovation risks to comprehensively promote the improvement of enterprise innovation capabilities and performance.

7.2. Countermeasures and Suggestions

(1) Corporate R&D investment can promote the improvement of corporate performance; companies can increase corporate R&D investment to improve corporate performance. However, enterprises cannot blindly increase R&D investment, but must also use their R&D investment rationally to maximize the utilization of R&D investment [19] . Enterprises must

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develop innovative thinking and spontaneously invest in corporate scientific and technological research and development. However, corporate innovation cannot be limited to the development of static innovation. It also needs to develop dynamic innovative thinking [20] to improve corporate innovation conversion capabilities and further improve corporate performance.

(2) Improve innovation and transformation capabilities. Most Chinese companies invest in corporate R&D, but Chinese companies still face many technical bottlenecks and rely heavily on foreign countries for core technologies. Therefore, China needs to vigorously improve its innovation transformation capabilities, transform technologies and products into practical applications [21] , and achieve the integration of industry, academia and research to enhance the innovation capabilities of the entire country's manufacturing industry. It is necessary not only to improve the enthusiasm of enterprises for innovation, but also to improve the efficiency of transforming technological innovation into entities. It cannot just be superficial.

(3) Enterprises must prevent and control innovation risks. Innovation is very important to an enterprise, but once innovation fails, the enterprise may make bigger mistakes, causing the enterprise to go bankrupt. For example, in the face of the advent of the smart era, Nokia mobile phones actively carried out corporate innovation, but the innovation was not successful, and Nokia's strong era also passed. Innovation risk prevention and control can help enterprises reduce losses. At the same time, innovation risk prevention and control can also protect the long-term development of enterprises. The long-term success of enterprises is based on continuous innovation capabilities, and innovation risk is a key factor affecting innovation capabilities. Therefore, when enterprises innovate, they must pay attention to the prevention and control of enterprise innovation risks and leave a way for their sustainable development.

(4) Enterprises must improve their corporate risk prevention and control systems. Enterprises should establish a team or department dedicated to risk management and formulate relevant risk management policies and procedures. At the same time, it is necessary to establish a complete risk assessment and monitoring mechanism to promptly discover and evaluate possible risks to prevent and control innovative risks for enterprises. On this basis, enterprises must formulate clear innovation goals and innovation strategies. Clear goals and strategies can help companies better assess and control innovation risks.

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