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The Role of Investor Protection on Corporate R&D

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Abstract: This study investigates the impact of investor protection on corporate R&D investment using panel data from Chinese A-share listed companies spanning 2015 to 2022. By employing OLS regression, mediation, and moderation analyses, the results demonstrate that robust investor protection mechanisms significantly enhance corporate R&D expenditures. The mediation analysis reveals that investor protection alleviates financing constraints and improves information disclosure quality, both of which serve as key channels for fostering R&D investment. Furthermore, internal control systems and media attention are identified as positive moderators, amplifying the beneficial effects of investor protection on R&D. In contrast, the equity Herfindahl index (HHI) does not exhibit a significant moderating role. The study also highlights that financial leverage, profitability, and equity concentration negatively influence R&D, while revenue growth exerts a positive effect. These findings underscore the critical role of investor protection in driving corporate innovation and sustainable growth, offering valuable insights for policymakers and corporate managers aiming to optimize R&D strategies through improved governance frameworks.

Keywords: Investor protection, Corporate R&D, Financing constraints, Information disclosure, Mediation effect, Moderating effect

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1. Introduction

In China's A-share market, investor protection mechanisms have multiple impacts on corporate R&D investment. As investor protection efforts increase, investors' confidence in the market grows, making them willing to provide funds to enterprises [1]. This broadens the financing channels for corporate R&D investment and solves the problem of R&D funding shortages. A sound investor protection mechanism can stabilize enterprises' expectations, prompting them to focus on long-term development strategies and increase R&D investment to enhance their core competitiveness. When enterprises know that their operations are properly supervised and investors' rights and interests are protected, it will be a strong motivation to invest in R&D innovation [2].

However, due to the characteristics of R&D activities, such as a long R&D cycle, high risk of failure, and results may not be presented in the current financial year, short-term focused indicators will be dragged down.

To cater to them, enterprises may cut R&D investment as R&D activities will negatively affect performance indicators in the short term. In addition, the compliance requirements related to investor protection have increased, and enterprises need to invest more resources in information disclosure, corporate governance improvement, etc., which increases operating costs and, to a certain extent, squeezes R&D funds. But in the long run, positive factors still dominate [3].

Based on these influences, this research plans to deeply explore the differences in the impact of different investor protection mechanisms on corporate R&D investment, to accurately optimize the investor protection system; study how to balance the short-term interests of investors and the long-term R&D investment needs of enterprises, build a reasonable incentive mechanism, guide investors to pay attention to the long-term development of enterprises, and encourage enterprises to increase R&D investment; analyze the relationship between investor protection mechanisms and corporate R&D investment in different industries, enterprise sizes, and development stages, to provide a basis for formulating differentiated policies.

2. Methods

2.1. Basic regression model

Based on the article's hypothesis 1, the investor protection role has a positive effect on the impact of corporate R&D, to test this hypothesis, this paper constructs the benchmark regression model as follows:

$$RDRatio\_ic_{it} = \alpha_0 + \alpha_1 \mathrm{InvProt}_{it} + \alpha_2 + \beta_2 Controls_{i,t} + Year_t + Ind_i + \varepsilon_{i,t} \quad (1)$$

Where, $RDRatio\_ic_{it}$ is the explanatory variable of this paper, and its meaning represents the ratio of R&D expenditures to current operating income. InvProt is the explanatory variable of this paper, which stands for the investor protection index. Meanwhile, the model selected in this paper is a two-way fixed effect model, *Year* represents year fixed effect, and *Ind* represents the industry fixed effect. $\varepsilon_{i,t}$ denotes the random perturbation term.

2.2. Mediation effects model

Based on the article's hypothesis 2, the investor protection index can alleviate the cost of debt financing, improve the quality of information disclosure, and then promote corporate R&D. This paper uses the three-step regression method of mediation effect, and constructs the mediation effect model as follows:

$$\mathrm{SA\ kv\_r}_{i,t} = \alpha_0 + \alpha_1 \mathrm{InvProt}_{it} + \alpha_2 + \beta_2 Controls_{i,t} + Year_t + Ind_i + \varepsilon_{i,t}\# \quad (2)$$

$$RDRatio\_ic_{it} = \alpha_0 + \alpha_1 \mathrm{InvProt}_{it} + \alpha_2 + \beta_2 Controls_{i,t} + + \beta_3 \mathrm{SA\ kv\_r}_{i,t_{i,t}} + Year_t + Ind_i + \varepsilon_{i,t}\# \quad (3)$$

Where, *SA,kv_r* denotes the degree of financing constraints and the quality of disclosure, respectively, is the mechanism variable of this paper indicates that the smaller the firm's financing constraints indicator, the weaker the financing constraints.

2.3. Moderated effects model

Moderating effects are changes in the relationship between the independent and dependent variables in a regression model due to the presence of one or more moderating variables [4]. When there is a moderating effect, the moderating variable changes the strength or direction of the relationship between the independent and dependent variables. Specifically, if the moderating variable has a significant effect on the relationship between

the independent and dependent variables, we call this a positive moderating effect or a negative moderating effect, depending on the direction in which the moderating variable affects the relationship.

When there is a moderating effect of the moderating variable, the coefficient estimation in the regression model should not only take into account the direct effect of the independent variable on the dependent variable, but also take into account the moderating effect of the moderating variable on this relationship. Therefore, this paper constructs the moderating effect model as follows:

$$RDRatio\_ic_{it} = \alpha_0 + \alpha_1 \mathrm{InvProt}_{it} + \alpha_2 + \beta_2 Controls_{i,t} + + \beta_3 \mathrm{W}_{i,t_{i,t}} + Year_t + Ind_i + \varepsilon_{i,t} \quad (4)$$

Where, W is the moderating variable, which in this paper is the internal control index (NK), media attention (Media), and the equity Herfindahl index (HHI).

3. Results

3.1. Variable selection and data sources

Table 1 shows description of variables in the research paper. It categorizes variables into Explanatory, Intermediary, Moderator, and Control types. It offers a logical structure that simplifies understanding the research framework. The use of consistent formatting enhances readability, ensuring even complex concepts are accessible.

Table 1. Description of variables

	VarName		
Explanatory variable	RDRatio_ic	R&D as a percentage	Ratio of R&D expenditures to current operating revenues
	InvProt		Investor Protection Index
Intermediary variable	SA	SA index	The larger the absolute value, the more severe the degree of financing constraints.
	kv_r	Quality of disclosure	KV index
Moderator variable	NK	internal control	Natural logarithm of the Dibble internal control index
	Media	Media attention	Total media coverage, plus one in natural logarithms)
	HHI	Equity Herfindahl Index	The sum of the squares of the shareholdings of the company's top 10 largest shareholders
Control variable	Size	Company size	Natural logarithm of total assets for the year
	Lev	financial leverage	Total liabilities at year-end divided by total assets at year-end
	ROA	Net profit margin on total assets	Net profit/average balance of total assets
	Cashflow	Cash flow levels	Net cash flows from operating activities divided by total assets
	FIXED	Fixed assets as a percentage	Ratio of net fixed assets to total assets
	Growth	Revenue growth rate	Current year's operating income/previous year's operating income - 1
	Indep	Proportion of independent directors	Independent directors divided by number of directors
	TOP1	Shareholding ratio of the largest shareholder	Number of shares held by the largest shareholder/total number of shares

In this paper, the listed companies selected from 2015–2022 as the initial sample data, and made three treatments: (1) exclude the financial category; (2) exclude ST and *ST companies; (3) exclude companies with more missing values. All company data in this paper comes from the Cathay Pacific (CSMAR) database and WIND data, and the basic characteristics of all variables are in **Table 2**.

Table 2. Descriptive statistical analysis of variables

Variable	N	Mean	SD	Min	p25	p50	p75	Max.
RDRatio ic	18300	0.0549	0.111	0	0.0206	0.0388	0.0616	8.954
RDRatio sz	18300	0.0259	0.0268	0	0.0103	0.0213	0.0336	1.455
InvProt	28400	55.68	4.530	31.48	52.86	55.78	58.68	74.43
SA	20100	3.900	0.259	2.094	3.745	3.905	4.070	5.690
kv r	20200	0.0951	0.160	0	0.0187	0.0441	0.106	3.513
NK	19500	6.458	0.162	4.749	6.421	6.488	6.537	6.847
Media	19300	4.979	0.994	1.386	4.331	4.820	5.451	11.85
HHI	20200	0.147	0.112	0.000900	0.0648	0.116	0.201	0.810
Size	20200	22.37	1.307	20.06	21.43	22.18	23.11	26.41
Lev	20200	0.424	0.200	0.0640	0.267	0.417	0.567	0.907
ROA	20200	0.0349	0.0734	-0.283	0.0118	0.0370	0.0700	0.228
Cashflow	20200	0.0492	0.0669	-0.149	0.0110	0.0475	0.0871	0.248
FIXED	20200	0.197	0.150	0.00180	0.0793	0.165	0.281	0.666
Growth	20200	0.151	0.367	-0.590	-0.0330	0.101	0.261	2.068
Indep	20200	0.379	0.0562	0.143	0.333	0.364	0.429	0.800
TOP1	20200	0.328	0.145	0.0826	0.216	0.303	0.421	0.726

3.2. Return to baseline

As shown in **Table 3**, this paper tests the effect of the role of investor protection on firms' R&D, with columns (1) and (2) showing the regression results controlling for year and industry fixed effects and control variables. Column (1), the explanatory variable is RDRatio_ic, and column (2), the explanatory variable is RDRatio_sz.

Table 3. Benchmark regression

	(1) RDRatio_ic	(2) RDRatio_sz
InvProt	0.0007***	0.0008***
	(0.000)	(0.000)
Size	-0.0001	-0.0023***
	(0.001)	(0.000)
Lev	-0.0812***	-0.0024**
	(0.007)	(0.001)
ROA	-0.1833***	0.0075

Table 3 (Continued)

	(1) RDRatio_ic	(2) RDRatio_sz
	(0.035)	(0.005)
Cashflow	-0.0678***	0.0105***
	(0.015)	(0.003)
FIXED	-0.0320***	-0.0118***
	(0.007)	(0.001)
Growth	0.0086	0.0032***
	(0.008)	(0.001)
Indep	-0.0022	-0.0031
	(0.012)	(0.003)
TOP1	-0.0080	-0.0020
	(0.008)	(0.001)
_cons	0.0709***	0.0358***
	(0.017)	(0.004)
Ind FE	Yes	Yes
Year FE	Yes	Yes
N	18341	18341
Adj. R^2	0.122	0.293

In both column (1) and column (2), the coefficient of ESG is significantly positive, indicating that the role of investor protection can promote corporate R&D, which verifies the hypothesis of this paper.1 From the point of view of the control variables, the financial leverage (LEV), the profitability of total assets (ROA), the level of cash flow (Cashflow), the level of fixed assets, and the level of fixed assets are the most important variables in this paper. level (Cashflow), fixed asset ratio (FIXED), and equity concentration (TOP) have a significant negative impact on corporate R&D investment, and the growth rate of operating income (GROWTH) has a significant positive impact.

3.3. Mechanism testing

3.3.1. Mediation effects analysis

As shown in **Table 4**, the investor protection role on improving the quality of disclosure, corporate R&D is significantly positively correlated at 1% level with positive 0.0456 and 0.0069, respectively. indicating that the quality of disclosure plays a mediating role. And corporate financing cost is significantly negatively correlated at 1% level with -0.0277 and -0.0062, respectively, indicating that the investor protection role effectively mitigates corporate debt financing cost verifying hypothesis 2 of this paper.

Table 4. Intermediation effects

	(1) SA kv_r	(2) RDRatio_ic	(3) RDRatio_sz
InvProt	0.0007***	0.0007***	0.0008***
	(0.000)	(0.000)	(0.000)
SA		-0.0277***	-0.0062***
		(0.005)	(0.001)
kv_r		0.0456***	0.0069***
		(0.008)	(0.001)
Size	-0.0001	0.0007	-0.0022***
	(0.001)	(0.001)	(0.000)
Lev	-0.0812***	-0.0762***	-0.0014
	(0.007)	(0.007)	(0.001)
ROA	-0.1833***	-0.1937***	0.0060
	(0.035)	(0.037)	(0.005)
Cashflow	-0.0678***	-0.0668***	0.0107***
	(0.015)	(0.015)	(0.003)
FIXED	-0.0320***	-0.0288***	-0.0114***
	(0.007)	(0.008)	(0.001)
Growth	0.0086	0.0069	0.0029***
	(0.008)	(0.008)	(0.001)
Indep	-0.0022	-0.0123	-0.0052*
	(0.012)	(0.013)	(0.003)
TOP1	-0.0080	-0.0182**	-0.0039***
	(0.008)	(0.007)	(0.001)
_cons	0.0709***	0.1581***	0.0582***
	(0.017)	(0.031)	(0.006)
Ind FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
N	18341	18333	18333
Adj. R^2	0.122	0.130	0.298

3.3.2. Moderating effects analysis

As shown in **Table 5** and **Figure 1**, the coefficients of the independent variables are all significantly positive at the 5% level and consistent with the sign of the main hypothesis, indicating that there is a significant moderating effect of the internal control index (NK) and media attention (Media).

Table 5. Regulatory effects

	(1) RDRatio_ic	(2) RDRatio_sz
InvProt	0.0017***	0.0011***
	(0.000)	(0.000)
NK	0.0573*	0.0221**
	(0.032)	(0.009)
Media	0.0803*	0.0286**
	(0.043)	(0.012)
HHI	0.9645	0.2709
	(0.787)	(0.256)
NK_Media	-0.0100	-0.0036*
	(0.007)	(0.002)
NK_HHI	-0.1233	-0.0334
	(0.119)	(0.039)
Media_HHI	-0.1552	-0.0562
	(0.166)	(0.052)
NK_Media_HHI	0.0186	0.0070
	(0.025)	(0.008)
SA	-0.0258***	-0.0073***
	(0.004)	(0.001)
kv_r	0.0482***	0.0060***
	(0.009)	(0.002)
Size	-0.0065***	-0.0052***
	(0.001)	(0.000)
Lev	-0.1014***	-0.0097***
	(0.007)	(0.001)
ROA	-0.2438***	-0.0031
	(0.045)	(0.006)
Cashflow	-0.0756***	0.0029
	(0.015)	(0.004)
FIXED	-0.0639***	-0.0229***
	(0.006)	(0.001)
Growth	0.0100	0.0036***
	(0.009)	(0.001)
Indep	-0.0032	0.0011
	(0.015)	(0.003)
TOP1	-0.0430***	-0.0183***
	(0.013)	(0.004)
_cons	-0.1636	-0.0435
	(0.214)	(0.061)
Ind FE	Yes	Yes
Year FE	Yes	Yes
N	17093	17093
Adj. R^2	0.079	0.119

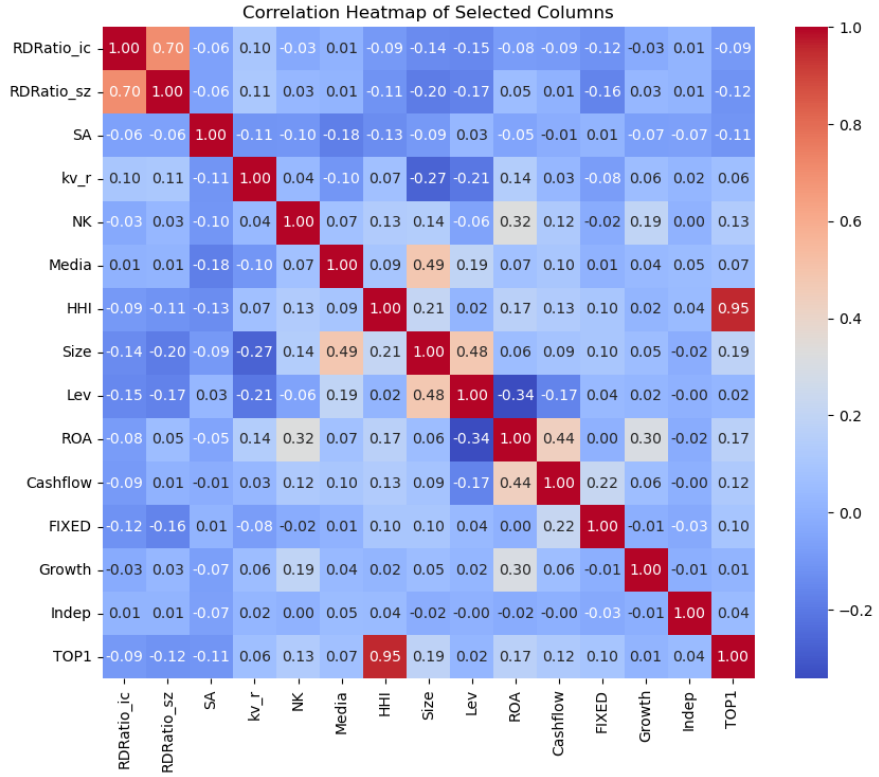

Figure 1. Correlation analysis

3.4. Correlation analysis

This paper carries out a simple correlation analysis of the data of the investor protection index, enterprise R & D, SA index, disclosure quality and other variables, the results are shown below, from which we can see the correlation coefficient between the variables, the larger the absolute value of this correlation coefficient indicates that the relationship between the two variables is closer, that is to say, the variables have a relatively high degree of correlation [6]. As a whole, the correlation coefficient of each variable is not close to -1 or 1, and the whole is within the range of -0.5 to 0.5, which indicates that the independence of each variable is good, and the possibility of negative impact on the subsequent regression analysis is small [7]. It shows that the data selected in this paper are reliable overall.

4. Discussion

Based on the data of all A-share listed companies in China from 2015 to 2022, this paper analyzes the impact of investor protection on corporate R&D by using the OLS method, and further explores its mediating and moderating effects [8]. The findings show that investor protection has a significant positive impact on corporate R&D and can effectively promote corporate R&D investment. This conclusion remains highly robust after considering various robustness tests, such as replacing the explanatory variables.

From the mechanism test, investor protection significantly enhances the R&D expenditure capacity of enterprises by reducing their financing constraints and improving the quality of information disclosure. Specifically, the mediation effect analysis of investor protection index and corporate financing constraints shows that the alleviation of financing constraints is significantly negatively correlated at the 1% level, indicating that

investor protection can effectively reduce the cost of debt financing for enterprises [9]. Meanwhile, the mediation effect analysis of disclosure quality shows that investor protection is significantly and positively correlated with disclosure quality at the 1% level, further validating the mediating role of disclosure quality between investor protection and corporate R&D.

The moderating effect analysis shows that internal control (NK) and media attention (Media) have a significant moderating effect on the relationship between investor protection and corporate R&D. Among them, the moderating effects of internal control index and media attention are significantly positive at the 5% level, indicating that investor protection promotes corporate R&D more significantly when internal control and media attention are high. However, the moderating effect of the equity Herfindahl index (HHI) is not significant, suggesting that the effect of equity concentration on corporate R&D may be more complex and requires further research.

In addition, this paper finds that financial leverage, profitability of total assets, cash flow level, fixed asset ratio, and equity concentration have a significant negative impact on a firm's R&D investment, while the growth rate of operating income has a significant positive impact [10]. These results indicate that a firm's financial position and governance structure have a significant impact on its R&D decisions.

5. Conclusion

In summary, the findings of this paper provide strong empirical support for investor protection in promoting corporate innovation and sustainable development. Strengthening investor protection not only enhances corporate governance but also strengthens firms' R&D capabilities by optimizing the financing environment and improving the quality of information disclosure. This finding has important implications for policymakers and corporate managers, and suggests that the investor protection system should be further improved in order to promote innovative investment and high-quality development of enterprises.

Disclosure statement

The authors declare no conflict of interest.

References

[1] Bourveau T, Gao X, Li R, et al., 2025, Comply-or-Explain Regulation and Investor Protection. Journal of Accounting and Economics, 79(2–3): 101765.

[2] Imperatore C, Trombetta M, 2025, Earnings Management and Investor Protection During a Banking Crisis: The Role of the "Spare Tire" Effect. Journal of Accounting, Auditing & Finance, 40(2): 639–668.

[3] Wu Q, 2025, Study and Introduce More Hard Measures to Protect the Legitimate Rights and Interests of Investors. Chinese Chief Accountant, 2025(03): 14.

[4] Zhang C, Li J, Chen D, et al., 2025, Can Innovative Enforcement Mechanism Work in Weak Investor Protection Countries? Evidence from China. Journal of Accounting and Public Policy, 50: 107294.

[5] Jenner HM, 2024, Accredited Investor Tests: How to Balance, Access, Entrepreneurial Funding, and Investor Protection? Accounting & Finance, 65(1): 1047–1058.

[6] Azhar MK, Saadia I, Samina N, 2024, Impact of Financial Reporting Quality on Investment Efficiency and Role of

Investor Protection in Frontier Markets. Review of Accounting and Finance, 23(5): 598–620.

[7] Yildiz S, Wu Q, Watson DE, 2024, The Impact of Country-Level Investor Protection on Economic Policy Uncertainty and Corporate Investment Link. International Review of Finance, 25(1): e12472.

[8] Blank BD, Chen J, Posylnaya V, 2024, Insider Trading Restriction Enforcement, Investor Protection, and Innovation. Journal of Financial Research, 48(2): 431–472.

[9] Shen Y, 2024, The Impact of Investor Interest Protection on Corporate Innovation Efficiency. Finance Research Letters, 62(PA): 105106.

[10] Zhou Y, Zhu H, Hu X, et al., 2023, Disproportional Ownership Structures and Corporate R&D Investment: From the Investor Protection Perspective. International Journal of Technology Management, 92(4): 288–307.