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Do the host country's environmental regulations inhibit the enterprises' risk preference of multinational investment? Evidence from China

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ABSTRACT

How to achieve a win-win situation between environment protection and economic development in the process of outward foreign direct investment (OFDI) has always been a major issue of Chinese enterprises. In recent years, China has paid unprecedented attention to environmental protection, and issued relevant policies to encourage enterprises to abide by the host country's environmental regulations and fulfil their environmental protection-related responsibilities in the process of going global. However, the influence of the host country's environmental regulations on the enterprises' risk preference of multinational investment (MIRP) has not received the attention it deserves. This article makes an empirical analysis on how the host country's environmental regulations affect the MIRP by using the sample of China's A-share listed companies from 2010 to 2019, and emphatically tests the mediating roles of enterprises' green technology innovation, environmental information disclosure and corporate environmental responsibility, and the moderating role of shareholder protection policies. It is found that, on the whole, the host country's environmental regulations will inhibit the MIRP by accelerating enterprises' green technology innovation, increasing the level of environmental information disclosure and promoting environmental responsibility. Besides, the shareholder protection policies of the host countries can positively moderate the influence of the host country's environmental regulations on the MIRP.

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1. Introduction

As we all know, multinational investment plays an increasingly important role in the international economic development. Much more countries pay attention to the development of transnational investment, and thus increase the amount of outward

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foreign direct investment (OFDI). However, in face of the double challenges of COVID-19 and environmental problems to the economy, the call for 'green recovery' is getting louder and louder, which makes countries take the ecological environment as an important factor in their decisions of making economic policies, so as to transform and upgrade the economic driving force while restoring the economy (Lun & Han, 2021). Therefore, in order to achieve the goal of environmental protection and green production, countries usually make up strict environmental regulations in view of their own environmental problems (Zhang & Li, 2021). This would alleviate the contradiction between economic development and harmonious development between man and nature to a certain extent, but also exert great influences on foreign direct investment behaviour of enterprises. Therefore, the increasingly stringent environmental regulations in various countries would definitely have a far-reaching impact on transnational investment. It has become an important topic of international business to explore the influence of host country's environmental regulations on multinational investment of foreign enterprises.

According to the traditional economic viewpoint, the strict environmental regulations of the host country will increase the production cost of enterprises, hinder the improvement of productivity, and is not conducive to the competition of multinational enterprises in the international market (Jaffe et al., 1995), which makes enterprises pursuing profit maximization shift their production to places with weak environmental regulations, resulting in the so-called 'pollution shelter' effect. Among those studies trying to verify the effect of 'pollution shelter', some confirmed the negative correlation between environmental regulation and OFDI (Zhang & Fu, 2008; Sacks, 2018), while others failed to confirm it (Manderson & Kneller, 2012). In contrast, Porter's hypothesis holds that appropriate environmental regulations will not stop the inflow of OFDI, but have positive effects instead, such as promoting enterprises to carry out green technology innovation (Zhou & Wang, 2016), increasing the level of environmental information disclosure (Bi et al., 2012) and promoting enterprises to fulfill their environmental responsibilities (Pan, Xi, et al., 2014; Pan, Yi, et al., 2014), so as to make up for the costs brought to enterprises by complying with high environmental regulations through some mechanism (Porter & Van der, 1995). Although the impact of host country environmental regulations on OFDI has been verified to varying degrees (Ramanathan et al., 2017; Murty & Kumar, 2003), there is little mention of the effect of environmental regulations on the risk preference of multinational investment (MIRP). In order to avoid the harsh environmental regulations of the host country, enterprises might choose countries with relatively loose environmental regulations to invest. However, these countries usually have backward governance ideas, lagging economic development or even social unrest, which would lead to higher overall risks. Therefore, environmental regulations of the host country should play a crucial role in the choice of risk level for enterprises investing abroad. Then, what's the exact influence of environmental regulation on MIRP of enterprises?

To address this question, this article will take Chinese A-share listed companies from 2010 to 2019 as sample to empirically test the impact of host country's environmental regulations on firms' risk preferences for multinational investment, and analyse the exact mechanism from three dimensions of green technology innovation,

environmental information disclosure and corporate environmental responsibility. Besides, the moderating role of shareholder protection policies is further explored. The possible contributions of this paper are: first, it enriches the research on corporate multinational investment, as there are few studies exploring the relationship between host country's environmental regulations and MIRP of enterprises. Second, this article examines the relationship between host country's environmental regulations and green technology innovation, environmental information disclosure, and corporate environmental responsibility, and tests the impact of host country's environmental regulations via these three factors on MIRP, and explores the moderating role played by shareholder protection policies, providing empirical evidence for the optimization of relevant government policies and corporate high-quality development. Third, this article provides new ideas for countries to build a good business environment and promote multilateral investment through environmental regulations. Therefore, this study can be taken as a useful supplement to the existing literature and provide important evidence for optimizing the decision-making behaviour of multinational investment firms, as well as a useful reference for the optimization of relevant government policies.

2. Theoretical analysis and research hypothesis

According to traditional economics, under the condition that the factor market, consumer demand and enterprise technology remains unchanged, if the environmental regulation is strengthened, for the sake of environmental compliance, the production cost of enterprises will increase, and enterprises will reduce R&D expenditure, which is not conducive to the improvement of productivity (Palmer et al., 1995). Generally speaking, the more developed the economy, the more stable the politics, and the better the financial system, the stronger environmental regulations for enterprises would be, and vice versa (Li, 2020). In order to develop their economy, backward countries or regions tend to choose lower levels of environmental regulations to attract investment from abroad. However, these countries usually have high investment risks due to imperfect systems or low development levels. Consequently, in order to avoid the cost of environmental regulations, enterprises may increase their investments in countries with weak environmental regulation but relatively high overall risk, which shows high-risk preference of enterprises.

However, Porter and Van der, (1995) found that environmental regulations would also have positive effects on enterprises because moderate environmental regulations might lead enterprises to improve productivity, thus achieving a win-win situation of environmental protection and economic efficiency. This view is also known as Porter Hypothesis. Many studies have confirmed that the pressure of environmental regulation plays an important role in the multinational investment decision-making of enterprises (Song & Han, 2021; Wu & Zheng, 2020). However, the regulatory pressure does not always directly affect the investment decisions of enterprises (Suk et al., 2013), and will exert indirect influences on investment decisions by affecting the production and operation decisions at first. The research shows that the environmental regulation of the host country will have a positive effect on the internal decision-

making of enterprises, such as innovation decision-making (Zhang & Chen, 2022), information disclosure decision-making (Yao et al., 2016) and environmental responsibility decision-making (Liang et al., 2021), and then affect the investment behaviour and risk preference of enterprises. The specific influence mechanisms are as follows.

The first mechanism is green technology innovation effect. Green technology innovation emphasises reducing resource consumption and environmental pollution with the help of new ideas and technologies. In the face of the host country's environmental regulations, enterprises will have stronger motivation to carry out green technology innovation activities. The first reason is that the essence of environmental regulations is to reinforce the management of enterprise behaviour, which will definitely increase the operation costs and reduce the profit margin of enterprises, especially for those that are difficult to meet the environmental requirement, and thus in turn force enterprises to carry out green technology innovation (Zhao & Zhao, 2021). The second reason is that in order to adapt to the stringent environmental regulations of the host country, enterprises tend to form the first-mover advantage through green technology innovation activities (Wang et al., 2021; Aguilera-Caracuel & Ortiz-de-Mandojana, 2013). Usually, once green technology is put into use, the energy consumption of enterprises would be effectively reduced and the cost would be decreased. At the same time, green technology innovation can help enterprises produce more products with higher quality and more in line with green environmental protection standards, which on the one hand meets the requirements of environmental regulation of the host country and provides a favourable environment for the continuous operation of enterprises in the host country, and on the other hand improves the image of enterprises' products and the favour of consumers, so as to effectively improve the competitiveness of enterprises in the global market. Therefore, enterprises are encouraged to choose countries with relatively stringent environmental regulation as their investment destination instead of those with lower requirements of environmental regulation but higher risks.

The second mechanism is environmental information disclosure mechanism. According to the public pressure theory, the environmental information disclosure of enterprises is mainly the result of the pressure exerted by external stakeholders such as the government, the public and the media. Among them, government pressure is a kind of formal pressure exerted through making up environmental regulations, while the pressure of stakeholders such as the public, market and media is an informal pressure positively related to the requirements of environmental regulations (Sun et al., 2020). Generally speaking, the higher the requirements of environmental regulation, the greater the above pressures, and the higher the quality of enterprise environmental information disclosure. Cho and Patten (2007) believe that environmental information disclosure in the annual report is a function of public pressure borne by enterprises in the social and political environment. Wang (2008) and Bi et al., (2012) believe that the level of environmental information disclosure is affected by the government's environmental supervision system. The greater the pressure of the supervision system, the higher the level of environmental information disclosure. The research of Xiao and Zhang (2008) shows that due to more attention from the media and the public, the environmental information disclosure of enterprises with major

accidents usually increases for the sake of defending the legitimacy of their existence. With the improvement of the quality of environmental information disclosure, enterprises not only effectively respond to the requirements of external supervision and strengthen the regulatory compliance of enterprise operation, but also effectively send positive signals to creditors, investors and social groups, improve the reputation of enterprises, increase the confidence of investors and creditors and thus alleviate the financing constraints of enterprises. Thus, through investment in countries with stricter environmental regulation, enterprises can strengthen the quality of environmental information disclosure, obtain a good image and relatively abundant financial support, and thus reduce the motivation of enterprises to invest in countries with weak environmental regulation requirements but high risks.

The third mechanism is corporate environmental responsibility mechanism. Corporate environmental responsibility is one of the important contents of corporate social responsibility. It is an important component of enterprise green development and reflects the willingness and ability of enterprise green development to a great extent. Strict environmental regulation encourages enterprises to take active environmental responsibility (Pan, Xi, et al., 2014; Pan, Yi, et al., 2014). When the requirement of environmental regulation is low, enterprises will choose to pay relatively less environmental taxes or compensations for the sake of maximizing benefits, and passively participate in environmental governance. With the increasing requirement of environmental regulation, under the original equipment level or technical level, the cost of pollution control will continue to increase. When the enterprises cannot afford the increased cost or faces the risk of shutdown, they will turn to increase the investment in environmental responsibility, carry out technical improvement and equipment upgrading, and get involved in environmental governance in a more active way. In this sense, the host country's environmental regulation would provide external institutional constraints for enterprises, and urge enterprises to actively fulfil environmental responsibilities and reduce short-term opportunistic behaviour. Generally speaking, these enterprises might have less information asymmetry and principal-agent problems (Ghoul et al., 2011), which helps them to win the favour of financial institutions, regulators and the public, so as to obtain more financing support, policy support and high market position (Lin et al., 2015; Zhao & Xiao, 2019), and thus offset the increased costs resulted from stringent environmental regulation. Therefore, the motivation of enterprises to invest in countries with weak environmental regulation but high overall risk would be weakened.

In addition to the above three mechanisms, we hold that in countries with strong shareholder protection policies, the restraining effect of environmental regulations of the host country on the MIRP may be more obvious. When a country has a strong shareholder protection policy, the national economic interests tend to overwhelm other social problems (Weber et al., 2009). Although the ultimate goal of shareholder protection policies is to maximise shareholders' interests, and that of host country's environmental regulations is to realise of environmental interests, which seems to be not consistent with the former. However, from another point of view, the enterprises' shareholders, who benefit from shareholder protection policies, usually place greater emphasis on the legitimacy of corporate behaviours, such as complying with the host

country's environmental regulations to improve environmental performance. The decline of environmental performance may lead to the legitimacy crisis of enterprises and the subsequent punishment of government and the public, which is not conducive to the long-term development of enterprises. Thus shareholders in countries with strong shareholder protection policies might focus much more on long-term interests. On the other hand, environmental protection behaviours usually cost enterprises a large amount of resources, and thus reduce the profit margin of enterprises. However, managers usually tend to pursue short-term benefits because of agency problem, and thus reduce investment in environmental protection, which results in relatively poor environmental performance of enterprises (Li & Feng, 2015). Studies have confirmed that in order to increase managers' private benefits, environmental protection investment is often a passive behaviour for managers (Tang et al., 2013). To a certain extent, the laws and regulations on shareholder's protection can curb the private interests of managers (Pan, Xi, et al., 2014; Pan, Yi, et al., 2014), encourage shareholders to effectively participate in the supervision of the enterprises' environmental problems (Guan & Que, 2020), promote enterprises to carry out green technology innovation, fulfil their social responsibilities, improve the level of environmental information disclosure so as to meet the requirements of the host country's environmental regulations, and thus curb the MIRP of enterprises.

Based on the above analysis, the research hypotheses of this paper can be put forward.

Hypothesis 1: On the whole, host country's environmental regulations will inhibit the MIRP;

Hypothesis 2: Carrying out green technology innovation is the path of the host country's environmental regulations affecting the MIRP, that is, the host country's environmental regulation would promote the enterprises' green technology innovation behaviour, thus inhibiting the MIRP;

Hypothesis 3: Improving the level of environmental information disclosure is the path of the host country's environmental regulations affecting the MIRP, that is, the host country's environmental regulations would improve the level of environmental information disclosure of enterprises, thus inhibiting the MIRP;

Hypothesis 4: Fulfilling corporate environmental responsibility is the path of the host country's environmental regulations affecting the MIRP, that is, the host country's environmental regulation would promote enterprises to fulfil corporate environmental responsibility, thus inhibiting the MIRP;

Hypothesis 5: In countries with strong shareholder protection policies, the negative correlation between the host country's environmental regulations and the MIRP would be stronger.

3. Research design

3.1. Sample selection

In this article, data related to multinational investment events of enterprises are collected and sorted out through the annual reports of multinational corporations, and enterprises with multinational investment in Shanghai and Shenzhen stock markets

from 2010 to 2019 are selected as research samples. After excluding tax-free islands and "tax havens" for multinational investment destination, ST and * ST samples for multinational corporations and samples with missing related data, 71 countries, 8777 valid observation samples are finally obtained.

3.2. Variables and data sources

3.2.1. Explanatory variable

Host country's environmental regulation intensity (RPI). According to the gap between the performance of various indicators and the established goals in various countries and regions, Yale University and Columbia University jointly released the environmental performance index EPI. The higher the score, the stronger the environmental regulation. In order to improve the stability and accuracy of this index, this article uses the practices of Wu (2020) and others for reference, and adopts RPI to measure it. The calculation method is as follows:

$$\mathrm{RPI} = (\mathrm{EPI}_{\mathrm{other}} - \mathrm{EPI}_{\mathrm{China}})/\mathrm{EPI}_{\mathrm{China}} \tag{1}$$

Among them, $\mathrm{EPI}_{\mathrm{other}}$ is the environmental performance index of other countries and $\mathrm{EPI}_{\mathrm{China}}$ is the environmental performance index of our country. The positive RPI indicates that the host country's relative environmental regulation level is higher, while China's relative environmental regulation level is lower, and vice versa. Figure 1 represents the world map plotted according to average RPI scores of 71 countries in 2010–2019. The darker the shade, the greater the environmental regulation intensity of host countries. The grey colour represents those countries that were not considered in the study.

3.2.2. Explained variable

3.2.2.1. Enterprises' risk preference of multinational investment (MIRP). *The International Country Risk Guide* (ICRG), published by the US-based Political Risk Services Group (PRS), provides an index of political, economic and financial risk measures for more than 100 countries each year, with higher scores indicating lower risk. The index system consists of three sub-risk categories (political risk, economic risk and financial risk) with a total of 22 sub-indicators. The composite risk index (CR) for each country is calculated based on the three sub-risks by the formula: $\mathrm{CR} = 0.5 \times (\mathrm{PR} + \mathrm{ER} + \mathrm{FR})$. This article draws on the approach of Liu et al. (2020) and Peng et al. (2021) to measure enterprises' risk preference of multinational investment by combining all host country risks involved in their OFDI at the level of equation (2).

$$\mathrm{MIRP}_{i,t} = w_{i,j,t} CR_{i,j,t} \tag{2}$$

Among them, $\mathrm{MIRP}_{\mathrm{i,t}}$ is the enterprises' risk preference of multinational investment faced by company i in year t, and is the weighted average of the national comprehensive risks of all host countries involved in company i. This article, referring to Mihov and Naranjo (2019), divides the number of subsidiaries of company i in host country j by the total number of overseas subsidiaries owned by company i in year t

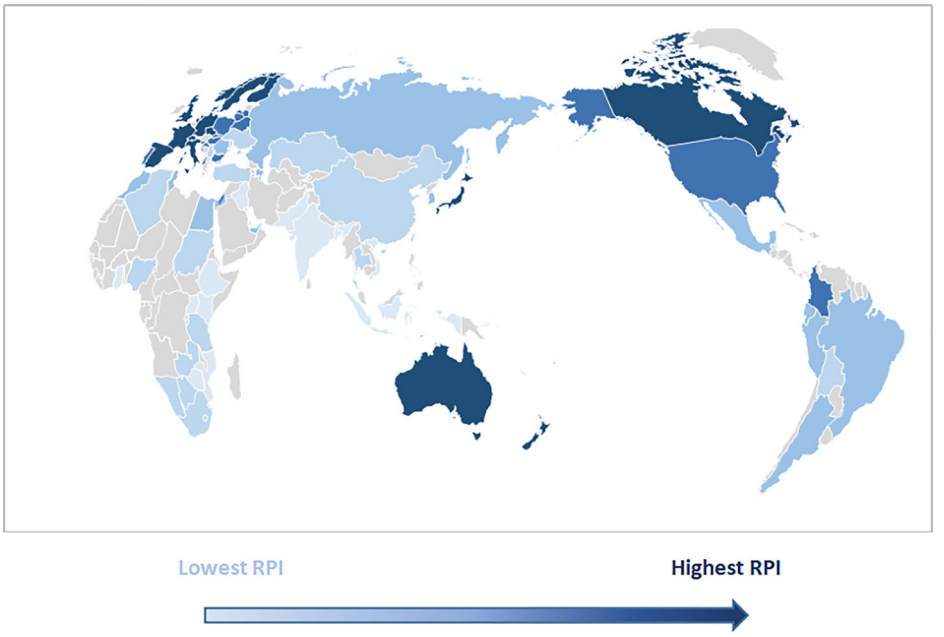

Figure 1. RPI world map.
Source: compiled by the authors themselves.

as weight $_{Wi,j,t.}$ Second, we linearly transform the MIRP as the equation showed, MIRP = 1- (MIRP ÷ 100), so that the value of MIRP is consistent with the direction of risk.

3.2.3. Mediating variables

3.2.3.1. Green technology innovation (Gpatents). This article adopts the number of green patents granted as an indicator to measure the green technology innovation capability of enterprises. The original data of the number of green patents granted by enterprises is based on the practices of Wang and Ning, (2020), and the Python software is used to search and capture the names of enterprises (including former names) and IPC classification numbers listed in *IPC Green Inventory* (*the List* for short) on the website of the State Intellectual Property Office of China. This article collects and counts the number of patents authorised by listed companies year by year, which is consistent with the IPC classification number contained in *the List* (that is, the number of green patents granted), and tests it with this index.

3.2.3.2. Environmental information disclosure quality (eidq). Referring to the research of Kong et al. (2021), this article uses the environmental research database in CSMAR database to classify the disclosure of environmental information by enterprises according to whether it is monetised or not (Wiseman, 1982): for monetised information, the combination of quantitative and qualitative disclosure is assigned a value of 2, the qualitative index is assigned a value of 1, and the undisclosed index is assigned a value of 0; For non-monetised information, the disclosed index is assigned to 2, and the undisclosed index is assigned to 0. This indicator comprehensively reflects the quality of environmental information disclosure of enterprises.

3.2.3.3. Corporate environmental responsibility (Cer). The social responsibility rating system of listed companies published by Hexun.com is based on five aspects: shareholder responsibility, employee responsibility, rights and interests responsibility of suppliers, customers and consumers, environmental responsibility and social responsibility. In this paper, the environmental score in the social responsibility rating system of listed companies is used to measure the environmental responsibility level of enterprises.

3.2.4. Moderating variable

3.2.4.1. Shareholder protection policies (Spp). The IMD *World Competitiveness Report* covers the data of 71 countries from 1989 to the present, which is determined by the implementation survey conducted by IMD World Competitiveness Center and the analysis of other objective data. In this article, the index of 'the degree to which shareholders' rights are fully implemented' is selected to measure the shareholder protection policies.

3.2.5. Control variables

The enterprise-level data comes from CSMAR database. The host country-level data are selected from World Bank official website.

The variable definitions and measurement indicators used in this article are detailed in Table 1.

3.3. Empirical model

In this article, we use panel regression to test the influence and mechanisms of host country's environmental regulations on MIRP, and set up the following regression models: Among them, model (1) is used to test the overall relationship between environmental regulations of host country and MIRP. According to the method of mediating effect analysis, this article further constructs models (2)–(7) to test whether green technology innovation, environmental information disclosure quality and corporate environmental responsibility are the mediating paths through which the environmental regulations of the host country affect the MIRP. Models (8) and (9) are used to test the moderating effect of shareholder protection policies. The process of testing the mediating effect is shown in Figure 2.

Model (1):

$$\mathrm{MIRP}_{it} = \alpha_0 + \alpha_1 \mathrm{RPI}_{it} + \alpha_2 \sum \mathrm{Controls}_{it} + \delta_i + \delta_t + \varepsilon_{it}$$

Model (2):

$$\mathrm{Gpatents}_{it} = \beta_0 + \beta_1 \mathrm{RPI}_{it} + \beta_2 \sum \mathrm{Controls}_{it} + \delta_i + \delta_t + \varepsilon_{it}$$

Table 1. Variable definition and measurement index.

Variable types	Variables	Measurement
Explained variable	Enterprises' risk preference of multinational investment (MIRP)	It is obtained based on weighted summation of ICRG national comprehensive risk indexes (CR) of all host countries involved by overseas subsidiaries of Company i, and the weight is weighted by the number of subsidiaries, and linear transformation is carried out: MIRP = 1-(MIRP ÷ 100), so that the value of CRR is consistent with the direction of risk.
Explanatory variable	Host country's environmental regulation intensity (RPI)	The difference of EPI index scores between host country and China and the ratio of EPI index in China
Mediating variables	Green technology innovation (Gpatents)	Number of green patents granted
	Environmental information disclosure quality (Eidq)	This variable consists of 25 indicators in five aspects: environmental management disclosure, environmental certification disclosure, environmental information disclosure carrier, environmental liability disclosure, environmental performance, and governance disclosure. For non-monetised information, it is 2 if one of them is disclosed, otherwise it is 0; For monetised information, quantitative and qualitative description is 2, only qualitative description is 1, and no description is 0. This variable is obtained by summing up 25 indicators and logarithmic processing.
	Corporate environmental responsibility (Cer)	Environmental score in social responsibility rating index of listed companies published by Hexun.com.
Moderating variable	Shareholder protection policies (Spp)	Index of 'the extent to which shareholders' rights are fully implemented' in IMD World Competitiveness Report
Control variables	The per capita GDP of the host country (LnGDPP)	The natural logarithm of the host country's per capita GDP
	Technology resource endowment of host country (Lnpatent)	The natural logarithm of the number of patent applications in the host country
	Natural resource endowment of host country (RAW)	The total rent of natural resources in the host country is measured as a percentage of GDP.
	The capital labour ratio of the enterprise (Lnalab)	Logarithmic value of the ratio of net fixed assets to the number of employees
	The enterprise scale (LnSize)	The logarithm of the total assets of an enterprise
	Profit margin on corporate net assets (ROA)	The ratio of after-tax net profit to total assets
	Asset-liability ratio of enterprises(Lev)	The ratio of total assets to total liabilities
	The growth of enterprises (Growth)	Enterprise operating income growth rate
	The age of enterprise (CA)	Number of years from the establishment year to the research year
	Whether the company has foreign executives (Foreign)	Assign a value of 1 to foreign executives, otherwise assign a value of 0
	Industry	Control
	Year	Control

Source: compiled by the authors themselves.

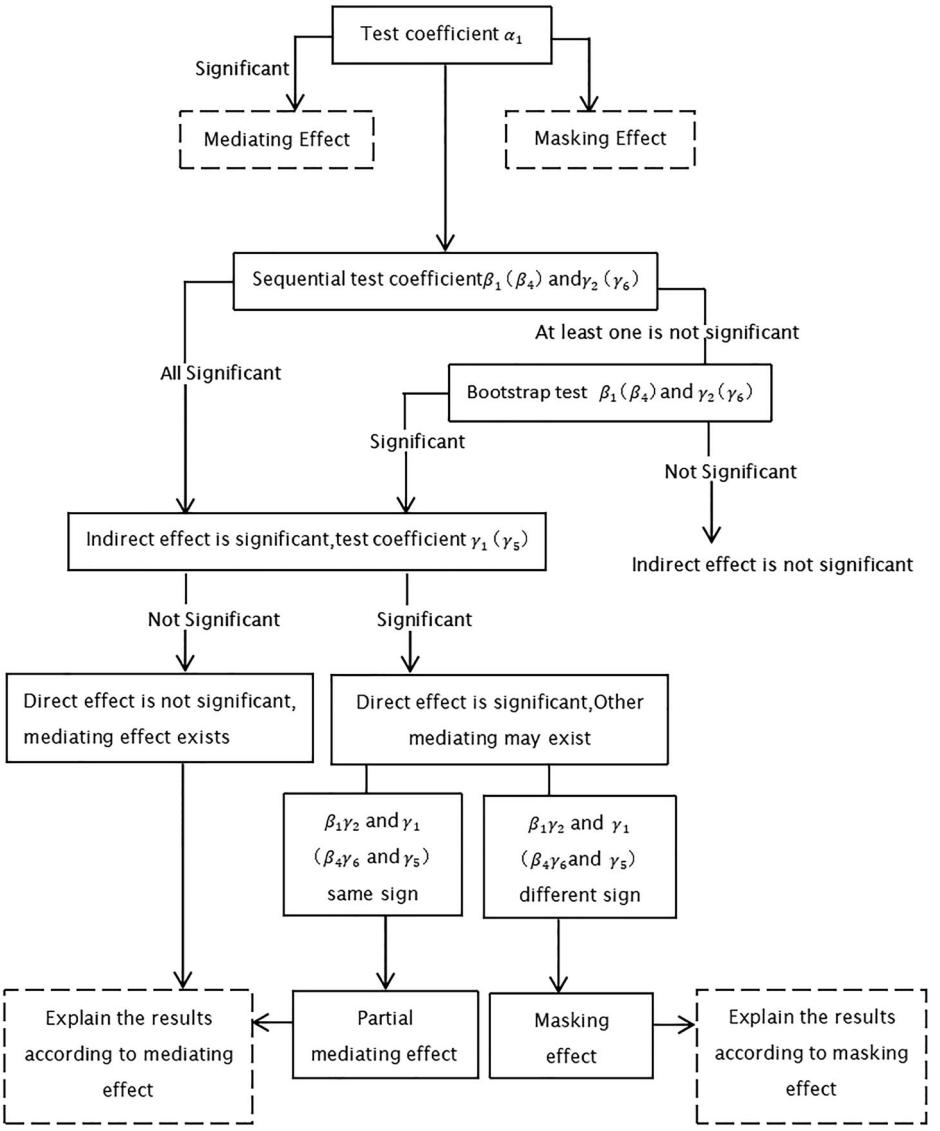

Figure 2. Mediating effect test process.
Source: compiled by the authors themselves.

Model (3):

$$\mathrm{MIRP}_{it} = \gamma_0 + \gamma_1 \mathrm{RPI}_{it} + \gamma_2 \mathrm{Gpatents}_{it} + \gamma_3 \sum Controls_{it} + \delta_i + \delta_t + \varepsilon_{it}$$

Model (4):

$$Eidq_{it} = \beta_3 + \beta_4 \mathrm{RPI}_{it} + \beta_5 \sum \mathrm{Controls}_{it} + \delta_i + \delta_t + \varepsilon_{it}$$

Model (5):

$$\mathrm{MIRP}_{it} = \gamma_4 + \gamma_5 \mathrm{RPI}_{it} + \gamma_6 Eidq_{it} + \gamma_7 \sum \mathrm{Controls}_{it} + \delta_i + \delta_t + \varepsilon_{it}$$

Model (6):

$$\mathrm{Cer}_{it} = \beta_6 + \beta_7 \mathrm{RPI}_{it} + \beta_8 \sum \mathrm{Controls}_{it} + \delta_i + \delta_t + \varepsilon_{it}$$

Model (7):

$$\mathrm{MIRP}_{it} = \gamma_8 + \gamma_9 \mathrm{RPI}_{it} + \gamma_{10} \mathrm{Cer}_{it} + \gamma_{11} \sum \mathrm{Controls}_{it} + \delta_i + \delta_t + \varepsilon_{it}$$

Model (8):

$$\mathrm{MIRP}_{it} = \alpha_3 + \alpha_4 \mathrm{RPI}_{it} + \alpha_5 \mathrm{Spp}_{it} + \alpha_6 \mathrm{RPI} \times \mathrm{Spp}_{it} + \alpha_7 \sum \mathrm{Controls}_{it} + \delta_i + \delta_t + \varepsilon_{it}$$

4. Empirical tests

4.1. Descriptive statistics and correlation analysis

The results of the correlation analysis in Table 2 show that there is a negative relationship between host country's environmental regulations and MIRP, which verifies the rationality and feasibility of the relevant assumptions in this paper to a certain extent, but it should be further tested by regression.

4.2. Regression analysis

4.2.1. Analysis of the direct effects of host country's environmental regulations on MIRP

To control for individual effects of firms, random effect model and fixed effect model are used for regression test at the same time, and the suitability of each model is tested. Table 3 presents the regression results. The results show the relationship between host country's environmental regulations and MIRP. The regression results indicate that host country's environmental regulations have an inhibitory effect on MIRP, thus proving that Hypothesis 1 is valid. In order to identify the suitability of the three models, we conducted LM test and Hausman test, respectively, and found that the fixed effect model was superior to the random effect model and the mixed regression model. The coefficient of RPI in fixed effect

Table 2. Descriptive statistics and correlation analysis results.

Variables												
MIRP	1.000	–	–	–	–	–	–	–	–	–		
RPI	−0.088***	1.000	–	–	–	–	–	–	–	–		
Gpatents	0.224***	−0.065***	1.000	–	–	–	–	–	–	–		
Eidq	0.119***	−0.025**	0.238***	1.000	–	–	–	–	–	–		
Cer	0.062***	−0.004	−0.062***	0.001	1.000	–	–	–	–	–		
Spp	−0.106***	0.462***	−0.072***	−0.002	−0.005	1.000	–	–	–	–		
CA	0.134***	−0.092***	0.031***	0.176***	0.111***	0.011	1.000	–	–	–		
Lnsize	0.390***	−0.058***	0.478***	0.416***	0.195***	−0.052***	0.223***	1.000	–	–		
Foreign	0.134***	0.040***	0.018*	0.050***	0.052***	0.024**	−0.002	0.124***	1.000	–		
lev	0.253***	−0.076***	0.372***	0.197***	0.066***	−0.096***	0.220***	0.564***	0.027**	1.000		
Lnpatent	−0.218***	0.302***	−0.122***	−0.098***	−0.033***	0.366***	−0.069***	−0.141***	0.013	−0.148***	1.000	
LnGDPP	−0.220***	0.312***	−0.119***	−0.092***	−0.018*	0.439***	−0.046***	−0.137***	0.010	−0.153***	0.908***	1.000
Mean	0.722	0.326	1.131	2.146	4.017	4.678	17.498	23.028	0.753	0.472	9.532	28.443
Standard deviation	0.255	0.272	1.298	0.987	4.216	0.910	5.758	1.490	0.431	0.192	2.625	1.568

Note: Values in brackets are t-values. *, **, *** indicate significant at the 10%, 5% and 1% levels, respectively.
Source: compiled by the authors themselves.

Table 3. Benchmark regression results.

Variables	Mixed sample regression	Random effect model	Fixed effect model
RPI	−0.018*	−0.068**	−0.021***
	(−1.871)	(−2.034)	(−3.563)
CA	0.002***	−0.000	0.012
	(5.175)	(−0.328)	(1.284)
Lnsize	0.065***	0.053***	0.075***
	(28.730)	(10.996)	(15.177)
ROA	0.036	−0.051	0.020
	(0.884)	(−0.971)	(0.654)
Foreign	0.055***	0.011	−0.007
	(9.634)	(1.338)	(−1.387)
cont	−0.071***	−0.060***	0.008
	(−11.784)	(−4.147)	(0.560)
lev	0.044**	0.097***	0.234***
	(2.564)	(3.325)	(11.602)
Growth	0.005***	0.003	0.000
	(6.034)	(1.202)	(0.727)
alab	−0.000	−0.000**	−0.000
	(−0.643)	(−2.414)	(−1.642)
Lnpatent	−0.009***	−0.018***	−0.002
	(−3.840)	(−4.383)	(−1.354)
LnGDPP	−0.016***	−0.020***	−0.003
	(−4.171)	(−3.000)	(−1.468)
RAW	−0.003***	0.004***	0.001**
	(−3.235)	(2.612)	(2.253)
_cons	−0.323***	−0.115	−1.206***
	(−3.243)	(−0.604)	(−6.107)
Observation	8777	8777	8777
LM		1658.01	
Hausman			251.83

Note: Values in brackets are *t*-values. *, **, *** indicate significant at the 10%, 5% and 1% levels, respectively.
Source: compiled by the authors themselves.

model is −0.021, which best describes the relationship between host country's environmental regulations and MIRP.

4.2.2. Test of mediating effect of green technology innovation

The results in Table 4 show that the coefficient of RPI (β_1) in model (2) is 0.186 and is significantly positive at the 1% level, indicating that host country's environmental regulation promotes green technology innovation. Model (3) examines the aggregate effect of host country's environmental regulations, green technology innovation and MIRP. The regression results show that the regression coefficient of Gpatents (γ_2) in model (3) is −0.002, indicating that green technology innovation inhibits MIRP, but it is not significant; the regression coefficient of RPI (γ_1) in model (3) is −0.020 and is significant at the 1% level. According to Figure 2, if α_1 is significant and at least one of β_1 and γ_2 is insignificant, it should be tested using Bootstrap method. According to Table 5, the confidence interval is found to not contain 0, indicating significant. $\beta_1\gamma_2$ and γ_1 have the same sign, indicating that there is a mediating effect of green technology innovation between host country's environmental regulations and MIRP. Thus hypothesis 2 holds.

4.2.3. Test of mediating effect of environmental information disclosure

The results in Table 6 show that the regression coefficient of RPI(β_4) in model (4) is 0.102 and is significantly positive at the 1% level, indicating that host country's

Table 4. Regression results of mediating effect of green technology innovation.

Panel A: Regression results				
	Model (2): Gpatents		Model (3): MIRP	
Variables	Coefficient	*T* value	Coefficient	*T* value
RPI	0.186***	6.296	−0.020***	−3.442
Gpatents			−0.002	−0.861
_cons	−8.759***	−10.479	−0.735***	−4.403
Control variables, industries and years	Control		Control	
N	8777		8777	
R^2	0.858		0.854	
F	34.642		48.893	

Note: Values in brackets are t-values. *** indicate significant at the 1% levels.
Source: compiled by the authors themselves.

Table 5. Bootstrap test results of green technology innovation.

	Green technology innovation	
Variable	Lower limit	Upper limit
Confidence interval	−0.002	−0.0001

Source: compiled by the authors themselves.

environmental regulations enhance the quality of corporate environmental information disclosure. Model (5) examines the aggregate effect of host country's environmental regulations, environmental information disclosure and MIRP. The regression results show that the regression coefficient of Eidq (γ_6) in model (5) is −0.006 and significantly positive at the 5% level, indicating that the quality of environmental information disclosure inhibits MIRP. The regression coefficient of RPI (γ_5) in model (5) is −0.020 and is significant at the 1% level. According to Figure 2, there is a mediating effect of environmental information disclosure between host country's environmental regulations and MIRP. Thus hypothesis 3 is valid.

4.2.4. Test of mediating effect of corporate environmental responsibility

The results in Table 7 show that the regression coefficient of RPI(β_7) in model (6) is 1.228 and is significantly positive at the 5% level, indicating that host country's environmental regulations enhance corporate environmental responsibility. Model (7) tests the aggregate effect between host country's environmental regulations, corporate environmental responsibility and MIRP. The regression results show that the coefficient of Cer (γ_{10}) in model (7) is −0.0001, indicating that corporate environmental responsibility inhibits MIRP, but γ_{10} is not significant.The coefficient of RPI (γ_9) in model (7) is −0.020 and is significant at the 1% level. According to Figure 2, if α_1 is significant and at least one of β_7 and γ_{10} is not significant, it should be tested using the Bootstrap method. Table 8 shows that the confidence interval does not contain 0, indicating significant. $\beta_7\gamma_{10}$ and γ_9 with the same sign, which indicates that there is a mediating effect of corporate environmental responsibility between host country's environmental regulations and MIRP. Thus hypothesis 4 holds.

4.2.5. Test of moderating effect of shareholder protection policies

Because RPI × Spp is used to test the moderating effect, and there may be multicollinearity at this time, we tested the multicollinearity of model (8) before testing.

Table 6. Regression results of mediating effect of environmental information disclosure.

Panel B: Regression results				
	Model (4): Eidq		Model (5): MIRP	
Variables	Coefficient	*T* value	Coefficient	*T* value
RPI	0.102***	3.324	−0.020***	−3.415
Eidq			−0.006**	−2.528
_cons	1.265	1.454	−0.710***	−4.288
Control variables, industries and years	Control		Control	
N	8777		8777	
R^2	0.733		0.854	
F	10.812		49.366	

Note: Values in brackets are *t*-values. **, *** indicate significant at the 5% and 1% levels, respectively.
Source: compiled by the authors themselves.

Table 7. Regression results of mediating effect of corporate environmental responsibility.

Panel C: Regression results				
	Model (6): Cer		Model (7): CRR	
Variables	Coefficient	*T* value	Coefficient	*T* value
RPI	1.235**	2.133	−0.020***	−3.484
Cer			−0.0001	−1.186
_cons	−53.744***	−3.275	−0.726***	−4.379
Control variables, industries and years	Control		Control	
N	8777		8777	
R^2	0.627		0.854	
F	45.912		48.949	

Note: Values in brackets are t-values. **, *** indicate significant at the 5% and 1% levels, respectively.
Source: compiled by the authors themselves.

Table 8. Bootstrap test results of corporate environmental responsibility.

	Corporate environmental responsibility	
Variable	Lower limit	Upper limit
Confidence interval	−0.007	−0.003

Source: compiled by the authors themselves.

Table 9 empirically tests the results of VIF test, which are all less than 10, so there is no multicollinearity between variables. So the moderating effect of shareholder protection policies is tested in Table 10. The regression coefficients of RPI and Spp are significantly negative. Besides, the direction of coefficient of RPI × Spp (−0.010) is consistent with that of RPI (−0.020) in model (8), indicating that the shareholder protection policy strengthen the negative effect of RPI on MIRP. In other words, in countries with strong shareholder protection policies, the negative correlation between the host country's environmental regulations and the MIRP would be stronger. Thus hypothesis 5 holds.

4.3. Heterogeneity test

4.3.1. Analysis from the perspective of different property rights

Ownership structure of enterprises can profoundly affect multinational investment behaviour. Consequently, this article further divides the samples into state-owned and non-state-owned firms so as to investigate the differences.

Table 9. The results of VIF test.

Variables	VIF	1/VIF
RPI	1.36	0.735
Spp	2.16	0.463
RPI × Spp	1.69	0.592

Source: compiled by the authors themselves.

Table 10. Regression results of moderating effect of shareholder protection policies.

Variables	Model (8)
RPI × Spp	−0.010**
	(−2.101)
RPI	−0.020***
	(−3.090)
Spp	−0.004*
	(−1.892)
_cons	−0.719***
	(−4.333)
N	8777
R^2	0.8544
F	45.725

Note: Values in brackets are *t*-values. *, **, *** indicate significant at the 10%, 5% and 1% levels, respectively.
Source: compiled by the authors themselves.

According to the results in Table 11, the coefficient of RPI in model (1) is significantly negative in both group A and group B. Furthermore, the Bootstrap method is used to investigate the difference of RPI coefficient between these two groups. The results show that the empirical *p* value is significant, which indicates that the host country's environmental regulations have a stronger inhibitory effect on the non-state-owned enterprises' MIRP. Next, further test the mediating and moderating effects.

First, according to the results of group A, although the coefficients of RPI in model (2) and model (3) are significant, but the coefficient of Gpatents in model (3) is not significant. Therefore, the Bootstrap test is used, and the confidence interval does not contain 0, indicating that the mediating role of green technology innovation is significant in state-owned enterprises. In the same way, the mediating role of green technology innovation in non-state-owned enterprises is tested, and it is found that the confidence interval contains 0, so the mediating role of green technology innovation is not significant in non-state-owned enterprises. It shows that, compared with non-state-owned enterprises, the host country's environmental regulations have a more significant restraining effect on the MIRP of state-owned enterprises through green technology innovation.

Second, in group A, the coefficients of RPI in model (4) and Eidq in model (5) are not significant. Through Bootstrap test, it is found that the confidence interval contains 0, so the mediating effect of environmental information disclosure is not significant for state-owned enterprises. However, in group B, the coefficients are all significantly positive, which shows that compared with state-owned enterprises, the host country's environmental regulations have a more significant effect on non-state-owned enterprises by improving the quality of environmental information disclosure to restrain the MIRP.

Third, in group A, the coefficients of RPI in model (6) and Cer in model (7) are not significant. Through Bootstrap test, it is found that the confidence interval

Table 11. Perspective of different property rights: state-owned and non-state-owned enterprises.

Group A: State-owned enterprises	Model (1)		Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)
RPI	−0.026***	Empirical *p* value:.075***	0.279***	−0.025***	0.020	−0.026***	1.531	−0.026***	−0.020**
	(−2.912)		(5.505)	(−2.821)	(0.452)	(−2.916)	(1.368)	(−2.938)	(−2.099)
Gpatents				−0.002					
				(−0.603)					
Eidq						0.002			
						(0.473)			
Cer								0.0002	
								(0.950)	
Spp									−0.008***
									(−2.592)
RPI × Spp									−0.012*
									(−1.735)
Cons	−0.880*		−12.952***	−0.909*	5.013**	−0.890*	−65.604	−0.870*	−0.864*
	(−1.813)		(−4.642)	(−1.863)	(2.015)	(−1.831)	(−1.063)	(−1.791)	(−1.781)
control variables, industries and years	control		control	control	control	control	control	control	control
N	2577		2577	2577	2577	2577	2577	2577	2577
R^2	0.875		0.870	0.875	0.732	0.875	0.655	0.875	0.876
F	6.788		15.643	6.251	4.755	6.239	10.905	6.297	6.274
Group B: non-state-owned enterprises	Model (1)		Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)
RPI	−0.017**		0.130***	−0.017**	0.128***	−0.016**	1.011	−0.016**	−0.020**
	(−2.298)		(3.642)	(−2.324)	(3.251)	(−2.132)	(1.561)	(−2.209)	(−2.338)
Gpatents				0.002					
				(0.579)					
Eidq						−0.010***			
						(−3.649)			
Cer								−0.001***	
								(−4.221)	
Spp									−0.003
									(−0.962)
RPI × Spp									−0.013*
									(−1.929)
Cons	−1.009***		−9.386***	−0.993***	0.257	−1.006***	−31.901*	−1.030 ***	−1.013***
	(−4.554)		(−8.791)	(−4.449)	(0.220)	(−4.548)	(−1.652)	(−4.658)	(−4.569)
Control variables, industries and years	Control		Control	Control	Control	Control	Control	Control	Control
N	6200		6200	6200	6200	6200	6200	6200	6200
R^2	0.853		0.849	0.853	0.724	0.854	0.646	0.854	0.854
F	46.236		29.711	42.405	6.157	43.595	37.051	44.008	39.424

Note: Values in brackets are *t*-values. *, **, *** indicate significant at the 10%, 5% and 1% levels, respectively. The 'Empirical p value' is used to test the significance of the difference of RPI coefficients in models (1) in group A and group B, and is obtained by Bootstrap for 1000 times.
Source: compiled by the authors themselves.

contains 0, so the mediating effect of corporate environmental responsibility is not significant for state-owned enterprises. In group B, the RPI coefficient of model (6) is not significant, and the Cer coefficient in model (7) is significant. Through Bootstrap test, it is found that the confidence interval does not contain 0, so the mediating effect of corporate environmental responsibility is significant for non-state-owned enterprises.

Finally, the coefficient of intersection term (RPI × Spp) in model (8) are significantly negative in both group A and group B, indicating that the positive moderating effect of shareholder protection policies exists in both state-owned enterprises and non-state-owned enterprises.

4.3.2. Analysis from the perspective of different industries

Considering that different industries have different financial characteristics, they show different risk preferences in transnational investment. In the context of environmental protection, this may be more prominent in pollution-intensive industries than in other industries. Therefore, this article divides the samples into pollution-intensive enterprises and non-pollution intensive enterprises to test the difference of the influence of host country's environmental regulations on MIRP.

According to the results in Table 12, the coefficient of RPI in model (1) is significantly negative in both group A and group B. The difference of the coefficients of RPI in these two groups is significant, which indicates that the host country's environmental regulations have a stronger inhibitory effect on the pollution-intensive enterprises' MIRP. Next, further test the mediating and moderating variables.

First, according to the results of group A, the coefficients of RPI in models (2) and (3) and the coefficient of Gpatents in model (3) are significant, indicating that the mediating role of green technology innovation is significant in pollution-intensive enterprises. However, the test of group B shows that the mediating role of green technology innovation is not significant in non-pollution intensive enterprises, which shows that compared with other industries; environmental regulation can better promote the green technology innovation of pollution-intensive enterprises and inhibit MIRP of enterprises.

Second, in group A, the coefficients of RPI in models (4) and (5) are significant, and the coefficient of Eidq in model (5) is not significant. Through Bootstrap test, it is found that the confidence interval does not contain 0, therefore, the mediating role of environmental information disclosure is significant for pollution-intensive enterprises. In the same way, it is concluded that the mediating effect of environmental information disclosure in group B is not significant. This shows that compared with other industries, pollution-intensive enterprises pay more attention to environmental information disclosure in order to obtain the legitimacy recognition of enterprise existence.

Third, in group A and group B, the RPI coefficient and Cer coefficient of models (6) and (7) are significant, so the mediating role of corporate environmental responsibility is significant for both pollution-intensive enterprises and non-pollution intensive enterprises.

Table 12. Perspective of different industries: pollution-intensive and non-pollution-intensive enterprises.

Group A: Pollution intensive enterprises	Model (1)		Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)
RPI	−0.045**	Empirical *p* value: −.062***	0.015***	−0.045**	0.123*	−0.045**	1.686***	−0.045**	−0.036*
	(−2.282)		(3.212)	(−2.281)	(1.672)	(−2.305)	(4.091)	(−2.283)	(−1.767)
Gpatents				−0.001***					
				(−4.107)					
Eidq						0.004			
						(0.582)			
Cer								0.0004**	
								(2.106)	
Spp									−0.007
									(−1.597)
RPI × Spp									−0.032**
									(−2.386)
Cons	−0.079		8.145***	−0.086	2.481	−0.090	7.212	−0.080	−0.072
	(−0.114)		(3.254)	(−0.123)	(0.946)	(−0.129)	(0.131)	(−0.114)	(−0.102)
Control variables, industries and years	Control		Control	Control	Control	Control	Control	Control	Control
N	1701		1701	1701	1701	1701	1701	1701	1701
R^2	0.802		0.833	0.802	0.747	0.802	0.687	0.802	0.803
F	6.670		3.008	6.154	1.034	6.180	10.046	6.154	6.166
Group B: Non-pollution intensive enterprises	Model (1)		Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)
RPI	−0.039***		0.222***	−0.038***	0.008	−0.039***	1.137*	−0.039***	−0.036***
	(−5.309)		(6.873)	(−5.153)	(0.239)	(−5.303)	(1.862)	(−5.247)	(−4.719)
Gpatents				−0.005					
				(−1.522)					
Eidq						−0.006**			
						(−2.224)			
Cer								−0.0004***	
								(−2.600)	
Spp									−0.004***
									(−2.625)
RPI × Spp									−0.019***
									(−3.119)
Cons	−1.268***		−12.967***	−1.326***	−0.289	−1.269***	−113.989***	−1.314***	−1.334***
	(−3.319)		(−7.781)	(−3.456)	(−0.166)	(−3.325)	(−3.618)	(−3.439)	(−3.479)
Control variables, industries and years	Control		Control	Control	Control	Control	Control	Control	Control
N	7076		7076	7076	7076	7076	7076	7076	7076
R^2	0.814		0.863	0.814	0.725	0.814	0.631	0.814	0.815
F	53.177		36.917	49.276	9.586	49.500	41.118	49.654	46.511

Note: Values in brackets are *t*-values. *, **, *** indicate significant at the 10%, 5% and 1% levels, respectively. The 'Empirical p value' is used to test the significance of the difference of RPI coefficients in models (1) in group A and group B, and is obtained by Bootstrap for 1000 times.
Source: compiled by the authors themselves.

Finally, in group A and B, the coefficients of RPI × Spp in model (9) are negative and significant, indicating that the positive moderating effect of shareholder protection policies exists in both pollution-intensive and non-pollution intensive enterprises.

5. Robustness test

5.1. Replacing explanatory variable

This article directly uses the EPI index as an absolute value for robustness testing. The higher the score, the stronger the environmental regulation. The results are shown in Table 13, which are consistent with the above results.

5.2. Replacing explained variable

Using the practice of Liu et al. (2020) for reference, this article replaces explained variable by calculating the country risk of the host country based on the simple arithmetic average method. The results in Table 14 repeat the main empirical results of this paper, indicating the results above are robust.

5.3. Propensity score matching (PSM) test

In this article, propensity score matching (PSM) method is used to control endogenous problems, and kernel matching method is selected for matching. First, it is necessary to assign the environmental regulations of the host country whose annual value is greater than the average value to 1, otherwise it is assigned to 0, and the selected matching variables are the control variables mentioned above. Then, the two groups of samples are fully mixed, and the results are shown in Table 15. Before matching, the average processing effect was 0.715, and it was significant at the level of 1%. It shows that the environmental regulations of the host country will reduce the MIRP

Table 13. Test of regression results for replacing explanatory variables.

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)
EPI	−0.022***	0.249***	−0.022***	0.089***	−0.022***	1.531**	−0.022***	−0.022***
	(−3.360)	(7.535)	(−3.274)	(2.580)	(−3.283)	(2.354)	(−3.327)	(−2.946)
Gpatents			−0.002					
			(−0.829)					
Eidq					−0.006**			
					(−2.561)			
Cer							−0.0001	
							(−1.141)	
Spp								−0.004*
								(−1.774)
EPI × Spp								−0.007*
								(−1.720)
Cons	−0.629***	−9.733***	−0.648***	0.905	−0.624***	−59.755***	−0.637***	−0.639***
	(−3.753)	(−11.538)	(−3.830)	(1.030)	(−3.723)	(−3.604)	(−3.797)	(−3.794)
Control variables, industries and years	Control	Control	Control	Control	Control	Control	Control	Control
N	8777	8777	8777	8777	8777	8777	8777	8777
R^2	0.854	0.858	0.854	0.733	0.854	0.627	0.854	0.854
F	52.792	36.143	48.782	10.440	49.273	46.001	48.833	45.545

Note: Values in brackets are t–values. *, **, *** indicate significant at the 10%, 5% and 1% levels, respectively.
Source: compiled by the authors themselves.

Table 14. Test of regression results for replacing explained variables.

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)
RPI	−0.040***	0.186***	−0.039***	0.102***	−0.039***	1.235**	−0.039***	−0.034***
	(−5.658)	(6.296)	(−5.545)	(3.324)	(−5.558)	(2.133)	(−5.612)	(−4.434)
Gpatents			−0.004					
			(−1.348)					
Eidq					−0.007**			
					(−2.543)			
Cer							−0.000*	
							(−1.822)	
Spp								−0.009***
								(−3.607)
EPI × Spp								−0.016***
								(−2.693)
Cons	−0.536***	−8.759***	−0.569***	1.265	−0.528***	−53.744***	−0.550***	−0.547***
	(−2.700)	(−10.479)	(−2.844)	(1.454)	(−2.658)	(−3.275)	(−2.768)	(−2.757)
Control variables, industries and years	Control	Control	Control	Control	Control	Control	Control	Control
N	8777	8777	8777	8777	8777	8777	8777	8777
R^2	0.810	0.858	0.810	0.733	0.810	0.627	0.810	0.811
F	56.989	34.642	52.751	10.812	53.142	45.912	52.877	49.912

Note: Values in brackets are *t*-values. *, **, *** indicate significant at the 10%, 5% and 1% levels, respectively.
Source: compiled by the authors themselves.

Table 15. Propensity score matching test results.

	Treatment group	Control group	ATT
Unmatched	0.715	0.738	−0.023***
Kernel matching	0.714	0.729	−0.015**

Note: **, *** indicate significant at the 5% and 1% levels, respectively.
Source: compiled by the authors themselves.

by 2.3% without controlling variables. In this article, the average processing effect value after Kernel matching is 0.714, which means that compared with the enterprises with weak environmental regulations in the host country, the MIRP with strong environmental regulations in the host country will be reduced by 1.5%, which is still significant at 5%. Therefore, the conclusion of this paper is still robust.

6. Discussion

In this study, we tested the effect of host country's environmental regulations on the MIRP. We find that the host country's environmental regulations will restrain the MIRP. Further, we demonstrate the mediating role of green technology innovation, environmental information disclosure, corporate environmental responsibility and the positive moderating role of shareholder protection policy. In the further research, from the perspective of heterogeneity of enterprises, we draw much valuable conclusions, which can be further discussed.

From the view of property rights, the environmental regulations of the host country have a significant inhibitory effect on the MIRP of state-owned enterprises and non-state-owned enterprises, but this inhibitory effect is more significant in non-state-owned enterprises. This may be because enterprises of different ownership have different risk-taking ability in multinational investment. To some extent, state-owned enterprises in China have stronger ability to take risk when they invest abroad

because of abundant fund and policy support from government. However, because of limited resources, non-state-owned enterprises can bear less risk in multinational investment and are more sensitive to the cost brought by environmental regulations. Therefore, the host country's environmental regulations have a more significant inhibitory effect on the risk preference of non-state-owned enterprises. In addition, the host country's environmental regulations have a more significant restraining effect on state-owned enterprises' MIRP through green technology innovation. The reason might be the special status of state-owned enterprises in China's economic system, which makes state-owned enterprises not only aim at the profit maximization just like general enterprises, but also undertake many political and social functions entrusted by the government, and enjoy many preferential subsidy policies given by the government (Zhang & Chen, 2022). Therefore, state-owned enterprises have stronger financial and technological support and are more capable of green technological innovation. Thus, the mediating role of green technology innovation is more significant for state-owned enterprises. However, compared with state-owned enterprises, the host country's environmental regulations have a more significant effect on non-state-owned enterprises by improving the quality of environmental information disclosure and fulfilling environmental responsibilities. The possible explanation for this is that, compared with non-state-owned enterprises, state-owned enterprises have stronger political connection (Gan et al., 2019), which is always regarded as the 'protective umbrella' for enterprises. Therefore, state-owned enterprises would face less administrative penalties for their failing to fulfil their environmental responsibilities (Luo & Liu, 2019). As a result, the environmental regulation of the host country has a weaker binding effect on state-owned enterprises. Consequently, the mediating effect of environmental information disclosure and corporate environmental responsibilities is less significant for state-owned enterprises.

For enterprises in different industries, although the host country's environmental regulations would significantly inhibit the MIRP of both pollution-intensive enterprises and non-pollution intensive enterprises, the inhibitory effect in pollution-intensive enterprises is much stronger. This may be because the environmental cost accounts for a large proportion in the production of pollution-intensive enterprises, and the nature of the industry makes them more constrained by environmental regulation. Therefore, the environmental regulation of the host country has a more significant impact on the MIRP of enterprises in polluting industries. The mediating role of green technology innovation and environmental information disclosure is more significant in pollution-intensive enterprises. The reason might be as follow: on the one hand, pollution-intensive enterprises, as the key regulatory targets of the host country's environmental regulations, will face much more stringent requirements in their production and operation activities; on the other hand, because of potential negative impact on environment, pollution-intensive enterprises would always receive more attention from the media and stakeholders, and thus have stronger motivation to carry out green technology innovation activities and improve the quality of environmental information disclosure, so as to maintain the enterprise image, create a good environment for enterprise development and establish investor confidence.

7. Conclusions and policy recommendations

This article takes the listed companies of foreign direct investment in Shanghai and Shenzhen stock market from 2010 to 2019 as sample, and studies the influence of host country's environmental regulations on the enterprises' risk preference of multinational investment (MIRP) and its influencing mechanism. The empirical results show that the host country's environmental regulations can inhibit the MIRP by promoting enterprises' green technology innovation, improving the quality of environmental information disclosure and fulfilling social responsibilities. The shareholder protection policies have a positive moderating effect. Referring to the conclusions, this article will put forward some suggestions for government departments and enterprises.

7.1. Suggestions for government departments

First, scientifically improve the intensity of China's environmental regulation, trying to integrate with international environmental regulations. Second, build an information platform for environmental regulations of foreign countries, and help enterprises go out smoothly. Third, continue to promote the negotiation of bilateral investment agreements and regional economic and trade agreements between China and other countries, so as to lower the investment barrier and investment risk in host countries. Fourth, further straighten out the relationship between the government and enterprises, reduce administrative subsidies to enterprises, especially state-owned enterprises and strengthen shareholder protection at the same time, so as to create a fairer business environment for all enterprises. Finally, continue to strengthen support for green innovation, establish an incentive system for enterprises to participate in environmental governance, encourage enterprises to fulfil their social responsibilities and improve the quality of environmental information disclosure.

7.2. Suggestions for enterprises

First, before investing abroad, conduct extensive and in-depth investigation about the host country, including environmental regulations and overall risks, so as to comprehensively assess its potential risks and make scientific investment decisions. Second, comply with the environmental regulations of the host country, meet the requirements of the host country's environmental regulations by improving the level of corporate technology innovation and the quality of environmental information disclosure, and fulfil social responsibility to reduce corporate risks. Third, different risk strategies should be taken according to the property right and industry.

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