

Green Investors' Shareholding and Corporate Environmental Violations

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ABSTRACT

The article takes the manufacturing listed companies on the Shanghai and Shenzhen A-share markets from 2009 to 2022 as research samples to explore the impact of green investor shareholding on corporate environmental violations. The results indicate that green investor shareholding in companies can effectively curb the occurrence of corporate environmental violations. Mechanism analysis shows that stimulating corporate green innovation and reducing corporate pollution emissions are important mechanisms for curbing corporate environmental violations. The research conclusions of this article provide a micro-analysis of the green governance role of green investors and offer significant policy implications for further development of green finance and the achievement of environmental sustainability.

KEYWORDS

Green Investors; Environmental Violations

1 Introduction

In recent years, environmental violations by listed companies in our country have occurred frequently. From 2019 to 2022, the number of administrative penalties issued by China's ecological and environmental departments has increased from 192,800 to 584,500, with the total amount of fines and penalties for environmental violations nationwide in 2022 reaching 7.672 billion yuan. Despite the Chinese government's efforts to prevent corporate environmental violations through a series of laws, regulations, and policies, such as the promulgation of the Environmental Protection Law of the People's Republic of China, the establishment of the Public Environmental Research Center, and the gradual advancement of the central ecological and environmental protection inspection system, the overall structural, fundamental, and trend pressures on ecological and environmental protection in China have not yet been fundamentally alleviated. Issues of pollution in key areas and industries remain prominent, and the protection of the ecological environment is a long-term and arduous task. Therefore, exploring how to effectively curb corporate environmental violations, properly manage and reduce environmental risks, and thus protect the environment from further damage, is a particularly critical issue.

Green development and environmental protection are important factors that are given priority in our country's economic development. Therefore, issues related to corporate environmental pollution have become a focal point of interest for institutional investors. In 2018, China issued the "Green Investment Guidelines (Trial)" which proposed strengthening fund managers' awareness of environmental risks. With China's green funds entering a fast lane of development, green investors, as a special entity among institutional investors, have gradually come into public view. Their unique

characteristics, which combine ecological and social benefits with economic benefits, provide new ideas and methods for achieving the dual-carbon goals and promoting the green transformation of the economy. Based on this, the purpose of this article is to construct a model to deeply explore the impact mechanism and governance mechanisms of green investors' shareholding on corporate environmental violations. The aim is to reveal the deep-seated reasons for the green governance effects of introducing green investors, to further improve China's green financial policy system, to promote the rapid development of China's green funds, and to provide theoretical reference for achieving the dual goals of environmental benefits and economic growth.

The marginal contribution of this article is mainly reflected in: First, enriching the research literature on green investors. The article extends the governance effect of green investors to the field of corporate environmental violations, providing a theoretical reference for further building a green financial system. Second, providing a new research perspective for analyzing the influencing factors of corporate environmental violations. Third, the research conclusions of this article help to standardize corporate environmental violations, reduce regional environmental violations, promote corporate environmental sustainable development, and provide new ideas for companies to maintain their environmental compliance in the current green context.

2 Literature Review

2.1 Review of Green Investor Literature

Through an analysis of the existing literature on green investors, it can be found that green investors are not only pursuing corporate economic benefits but also paying more attention to environmental sustainable development. Currently, there is relatively little research on green investors, and existing studies mainly examine the unique characteristics of green investors from two perspectives: financial performance and environmental performance. First, from the perspective of financial performance, some scholars point out that green investors not only focus on individual and social values but also pursue the maximization of risk-adjusted returns. Green investors tend to invest in environmentally friendly projects and enterprises, thereby promoting enterprises to implement green actions and increase green expenditures, reducing corporate capital costs, and accelerating the development of the green economy^[1]. Second, from the perspective of environmental performance research, the main focus is on analyzing the impact of green investors on the social environment through the green governance effect of green investors. Some studies believe that green investors can motivate polluting enterprises to strengthen environmental governance, promote corporate clean-up reforms, help enterprises gain excess returns while reducing corporate risks, promote enterprises to improve their environmental performance and sustainable development capabilities, and also enhance corporate innovation capabilities, ultimately achieving green development.^[2]

2.2 Review of Environmental Violation Literature

Existing research on factors affecting corporate environmental violations can be divided into the following categories: First, corporate operating costs. The characteristics of large initial investment, long cycle, and difficulty in generating economic benefits in environmental governance make funding issues a key obstacle in the process of environmental governance. When the cost of preventing and controlling environmental pollution is higher than its benefits or higher than the cost of paying environmental taxes and fines for violations, enterprises are more willing to choose illegal emissions rather than engaging in high-input, high-risk green innovation activities or bearing

the internalized environmental costs of environmental regulations. Second, resource allocation factors. In the process of allocating financial resources, financial institutions with heavy assets and heavily polluting enterprises are more likely to obtain low-cost financial resources. This imbalance in financial resource allocation accelerates the development of heavily polluting enterprises, prompting heavily polluting enterprises to increase pollution emissions and increasing corporate environmental violations. Third, foreign investment factors. Shao Chaodeng et al. explored that foreign investment can promote corporate green technological progress, achieving the effect of reducing unit resource consumption and pollution emissions, thereby effectively suppressing corporate environmental violations.^[3] Existing research on the impact of corporate environmental violations mainly focuses on Shen Hongbo et al., who proposed that once corporate environmental behavior is illegal, it will not only severely damage the reputation and image of the enterprise but also bear a series of legal consequences such as fines or suspension of production and rectification by environmental protection departments.

In summary, Existing literature on the characteristics and role of green investors is still relatively scarce, so further investigation into the effects of green investors' green governance role is still needed. Furthermore, current research on environmental violations started relatively late and mainly focuses on the macro and industry levels, focusing on assessing the impact of regional environmental regulations, policies, and their implementation on reducing pollution, protecting natural resources, and ecological balance, while ignoring the specific impact of individual behavior at the micro level on environmental violations. Therefore, this article starts from the perspective of green investors to study the relationship between Chinese green investor shareholding and corporate environmental violations, in the hope of providing direct evidence for research related to corporate environmental violations.

3 Theoretical Deduction and Research Hypotheses

The increase in the shareholding ratio of green investors in enterprises can effectively inhibit the occurrence of corporate environmental violations. The impact of green investor shareholding on corporate environmental violations has a duality, which may stimulate enterprises to take more environmentally friendly measures to achieve green development, or it may force enterprises to reduce environmental violations due to investment pressure. First, from the positive aspect, green investors, as a key external governance tool for enterprises, can participate in corporate green innovation through the "vote with hands" approach. As shareholders, green investors can exercise their voting rights, support environmental-related motions through voting, or require enterprises to formulate and implement strategies and policies that emphasize sustainable development, promoting enterprises to increase green innovation efforts and make enterprises pay more attention to green innovation.^[4] Secondly, from a negative perspective, green investors can exert governance effects by "voting with their feet," forcing companies to engage in green governance, thereby reducing corporate pollutant emissions and ultimately avoiding corporate environmental violations. As investors responsible to society, if a company's environmental performance is poor and causes dissatisfaction among green investors, they can exert pressure on the company by reducing investment amounts or threatening to sell their shares. This demonstrates to the company the seriousness of investors' concerns about environmental issues, thereby forcing the company to invest a significant amount of its own funds and other production factors into cleaning up its operations, compelling high-pollution companies to undergo technological upgrades and improvements, and thus promoting the development and optimization of green technologies in production processes, allowing companies to offer more products that incorporate green factors.

Since the level of corporate pollutant emissions is influenced by both the generation process of pollutants and the company's handling of pollutants, green and clean production processes can reduce the generation of pollutants, lower corporate pollution emissions, and mitigate the severity of corporate environmental violations.^[5]

4 Research Design

4.1 Sample Selection and Data Sources

Therefore, this paper selects the manufacturing industry as the research sample. Since the Chinese government rarely disclosed corporate environmental violations before 2009, this paper ultimately selects data from manufacturing listed companies on the Shanghai and Shenzhen A-share markets from 2009 to 2022 as the research sample. The green investor data used in this paper comes from the GTA database, Sohu Funds, and Tonghuashun Financial Services Network. Corporate environmental violation data comes from the IPE database. Through statistical analysis of corporate environmental violations in the IPE database, the number of environmental penalties and the amount of environmental penalties for each company each year were manually compiled. The financial data of listed companies used in this paper all come from the GTA database. To ensure the accuracy of empirical results, companies with missing variables and abnormal data were eliminated. In addition, a 1% winsorization treatment was performed on continuous variables.

4.2 Model Construction

$$Fines_{i,t+1} = \beta_0 + \beta_1 GL_ratio_{i,t} + \beta_2 Controls_{i,t} + \sum Ind + \sum Year + \epsilon_{i,t} \quad (1)$$

In equation (1), $Fines_{i,t+1}$ is the explained variable indicating whether a firm is subject to environmental penalties; $GL_ratio_{i,t}$ represents the shareholding of green investors in the firm; $Controls_{i,t}$ is a series of control variables; $\epsilon_{i,t}$ is the random error term. Additionally, the model controls for year (*Year*) and industry (*Ind*) fixed effects.

4.3 Variable Description

4.3.1 Corporate Environmental Violations

This paper primarily obtains data on environmental violations from the IPE Green Securities Database, using the number of environmental violations and the amount of fines for environmental violations as measures of corporate environmental violations. Based on the fines for environmental violations provided by the IPE Green Securities Database for each monitoring period, the fines are aggregated by firm-year to obtain the total fines for environmental violations in the current year, denoted as *Fines*. Similarly, the number of times a firm is fined for environmental violations is aggregated by firm-year across all environmental monitoring periods of each year in the IPE, denoted as *Punished_time*. Considering that it may take some time for green investors to exert their green governance effects within a firm, this paper lags the explained variable by one period to examine the persistent impact of green investors on corporate environmental violations.

4.3.2 Green Investor Shareholding

Following the method of Jiang Guangsheng et al., the "Fund Entity Information Table" and "Stock Investment Detail Table" from the GTA database are matched to obtain the list of funds invested by listed companies. Then, manually search the "investment objectives" and "investment scope" of

each fund for any mention of "new energy," "carbon reduction," "environmental protection," "green," "low carbon," "sustainable," "energy-saving," "clean," and other related terms. If such terms appear, it is assumed that the firm has green investors, and the proportion of green fund shareholding to the total number of shares in the firm is calculated as the green investor shareholding, denoted as *GI_ratio*.

4.3.3 Control Variables

Drawing on existing literature, this paper controls for other factors that may affect corporate environmental violations, such as firm size (*Size*), debt-to-asset ratio (*Lev*), cash flow ratio (*Cashflow*), shareholding proportion of the top five shareholders (*Top*), dual roles of CEO and board chair (*Dual*), years since company establishment (*FirmAge*), whether the firm is loss-making (*Loss*), number of board members (*Board*), proportion of independent directors (*Indep*), and return on total assets (*ROA*).

5 Empirical Analysis

5.1 Descriptive statistics of the variables

Table 1 reports the results of the descriptive analysis of the main variables. The mean of the green investor shareholding ratio is 0.643, indicating that in the selected sample of companies, the green investor shareholding ratio reaches 64.3%, and green investors have become an important entity participating in corporate governance in the capital market. The mean of the penalty amount is 0.101 million yuan, indicating that manufacturing industry enterprises face an average of 0.1 million yuan in environmental penalties annually during the sample period. The maximum penalty amount for enterprises is 9.49 million yuan, and the standard deviation is 0.904. It is evident that there is a significant difference in the green investor shareholding ratio among different enterprises, and thus there is also a certain difference in the environmental violations of different enterprises.

Table 1 Descriptive statistics of main variables

Variable	Obs.	Mean	S.D.	Min	Max
<i>Fines</i>	20506	0.101	0.904	0.000	9.490
<i>GI_ratio</i>	20506	0.643	1.479	0.000	9.364
<i>Size</i>	20506	22.099	1.174	19.957	27.349
<i>Lev</i>	20506	0.402	0.193	0.050	0.931
<i>Cashflow</i>	20506	0.051	0.067	-0.169	0.247
<i>Top</i>	20506	0.527	0.148	0.200	0.897
<i>Dual</i>	20506	0.301	0.459	0.000	1.000
<i>FirmAge</i>	20506	2.870	0.332	1.792	3.526
<i>Loss</i>	20506	0.100	0.300	0.000	1.000
<i>Board</i>	20506	2.120	0.192	1.609	2.708
<i>Indep</i>	20506	0.375	0.056	0.000	1.000
<i>ROA</i>	20506	0.046	0.064	-0.222	0.227

5.2 Regression Analysis

Table 2 reports the empirical test results of the relationship between the proportion of green investors' shareholding and corporate environmental violations. From column (1) of Table 3, it can be seen that the regression coefficient for the amount of fines (*Fines*) is -0.012, and it is significantly negative at the 1% level. This indicates that compared to companies with a lower proportion of

green investors' shareholding, companies with a higher proportion of green investors experience fewer environmental violations. Economically, the mean amount of fines for companies after the entry of green investors is 0.101 million yuan. This suggests that the presence of green investors plays a role in green governance, thereby preventing or reducing environmental violations and penalties for companies, while also avoiding environmental risks. Therefore, the shareholding of green investors can significantly curb the occurrence of corporate environmental violations, confirming that the hypothesis is valid.

Table2 Baseline Regression

Variable	Fines (1)
<i>Gl_ratio</i>	-0.012*** (-3.308)
<i>Controls</i>	Yes
<i>_cons</i>	-1.489*** (-3.005)
<i>Year</i>	Yes
<i>Ind</i>	Yes
Obs.	20506
Adj. R^2	0.0092

*, **, *** represent significance at the 10%, 5%, and 1% levels, respectively;

values in parentheses are t-values, the same below.

5.3 Mechanism Test

Based on the aforementioned theoretical analysis, green investors suppress corporate environmental violations by promoting corporate green innovation. To deeply understand the logic of green investors' impact on corporate environmental violations, this paper tests the mechanism of corporate green innovation. Following the approach of Wang Xin and Wang Ying, this paper uses the number of green patent applications to measure corporate green innovation. The results in Table 3 show that the coefficient in column (1) is significantly positive at the 10% level, indicating that green investor shareholding can promote corporate green innovation, thus preliminarily proving the hypothesis. Furthermore, this paper draws on the method of Mao Jie et al., and based on the pollution equivalent values determined by the "Pollutant Fees Collection Standard Management Measures", the chemical oxygen demand and ammonia nitrogen emissions in the wastewater discharged by the enterprise, as well as the sulfur dioxide and nitrogen oxides emissions in the waste gas discharged, are standardized, converted into unified pollution equivalent numbers, and the pollution equivalent numbers are summed and logged after adding 1 to measure the level of corporate pollution emissions. The results in Table 3 show that the coefficient in column (2) is significantly negative at the 10% level, confirming that green investors suppress corporate environmental violations by reducing the level of corporate pollution emissions, thus preliminarily verifying the hypothesis.

6 Conclusion

This article approaches from the perspective of green investors and examines the impact of green investor shareholding on corporate environmental violations. The study finds that green investor shareholding can significantly curb corporate environmental violations. Mechanism analysis indicates that green investor shareholding can exert a green governance effect to curb

corporate environmental violations, that is, green investor shareholding not only stimulates corporate green innovation but also prompts companies to reduce pollutant emissions, ultimately preventing corporate environmental violations.

Table3 Mechanistic testing

Variable	<i>GI</i>	<i>Pollution</i>
	(1)	(2)
<i>GI_ratio</i>	0.007* (1.693)	-0.000* (-1.717)
<i>Controls</i>	Yes	Yes
<i>_cons</i>	-2.943*** (-8.234)	0.132*** (659.894)
<i>Year</i>	Yes	Yes
<i>Ind</i>	Yes	Yes
Obs.	20506	20506
Adj. <i>R</i> ²	0.1936	0.9442

Based on the research conclusions of this article, the following policy implications are proposed: First, the government should strengthen the development of green funds and further improve China's green financial policy system, enhancing green financial support. It should also comprehensively consider the compatibility of green financial system policies with corporate types to maximize the synergistic emission reduction effects of different policies. Second, companies should establish and improve environmental information management systems and regularly publish environmental performance reports according to environmental information disclosure standards, including detailed data and progress on greenhouse gas emissions, energy consumption, waste treatment, etc., to ensure the comparability and transparency of the disclosed content. Lastly, investors should actively participate in green activities, promote their own green investment practices, and drive the entire financial market towards a more sustainable and environmentally friendly direction.

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