

The Impact of Institutional Investors' Shareholding on Green Bond Greenwashing Behavior

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Abstract

The scale of China's green bond market has rapidly expanded in recent years, yet greenwashing practices have emerged, undermining investor trust and posing challenges to financial stability. Existing research has mainly focused on issuers' characteristics and external audits, but the role of institutional investors in green bond markets remains unexplored. This study investigates the relationship between institutional investors' shareholding and green bond greenwashing behavior in China's capital markets. Through theoretical analysis and empirical testing, the author examines the supervisory and governance roles of institutional investors in mitigating greenwashing practices. Utilizing a dataset of 4,023 green bonds issued by A-share listed companies from 2016 to 2023, the findings demonstrate that higher institutional shareholding significantly reduces greenwashing, with long-term investors and those specializing in Environmental, Social, and Governance (ESG) investments exhibiting stronger inhibitory effects. Heterogeneity analysis reveals differential impacts across market environments and firm characteristics, particularly in regions with weaker environmental enforcement and among smaller, high-pollution firms. These results contribute to the design of regulatory frameworks and market-based mechanisms to enhance green bond credibility.

Keywords

Institutional Investors, Shareholding, Green Bonds, Greenwashing, ESG.

1. Introduction

With growing societal demands for sustainability, green bonds, as a critical vehicle for green finance, have surged in capital markets. By channeling funds to environmentally friendly projects, green bonds facilitate economic decarbonization. However, greenwashing-the misrepresentation of non-green projects as environmentally beneficial-remains a critical challenge[1]. By June 2023, China's green bond market reached ¥2.5 trillion, accounting for 25% of global issuance, yet greenwashing incidents persist. For example, in 2022, an energy firm redirected 30% of green bond proceeds to coal-related projects, undermining investor trust and market integrity [2]. Institutional investors, characterized by their expertise and long-term investment horizons, are uniquely positioned to monitor corporate behavior. This study explores how their shareholding influences green bond issuers' adherence to environmental commitments, addressing gaps in the literature on stakeholder governance in sustainable finance. By aligning with global regulatory trends, this research offers actionable insights for policymakers and market participants. This research holds significant implications for both academia and practice. Academically, it enriches the understanding of stakeholder governance in sustainable finance by examining the role of institutional investors in curbing greenwashing.

Practically, it provides actionable insights for regulators to enhance green bond market integrity and directs capital toward genuine sustainable projects [3].

2. Literature Review

2.1. Causes of Greenwashing

Greenwashing arises from information asymmetry, regulatory arbitrage, and symbolic corporate signaling [4]. Firms may exploit green labels to lower financing costs [5], yet excessive reliance on green bonds without substantive environmental benefits can stifle innovation [6]. In China, fragmented environmental disclosures-particularly in sectors like clean energy-hinder the verification of green project impacts [7]. Quantitative metrics, such as carbon reduction targets and energy efficiency benchmarks, are often inadequately reported, enabling opportunistic behavior. This lack of transparency exacerbates greenwashing risks, as firms may substitute genuine green initiatives with symbolic actions to meet market expectations. Given the growing scale of China's green bond market, understanding how institutional investors can mitigate such practices becomes crucial for enhancing market credibility and ensuring that financial resources are channeled toward projects with tangible environmental benefits [8].

2.2. Governance Role of Institutional Investors

In the section on the governance role of institutional investors, several hypotheses can be discussed. The effective supervision hypothesis suggests that institutional investors can reduce agency costs through active engagement, thereby improving transparency and curbing managerial opportunism [9]. For example, institutional shareholders in China have successfully pressured firms to disclose granular carbon emissions data [10]. Another perspective is the ineffective monitoring hypothesis, which posits that transaction-oriented investors may prioritize short-term returns over sustainability, leading to “exit over voice” strategies. Lastly, the collusion hypothesis highlights that conflicts of interest may lead to collusion with management, thereby exacerbating information asymmetry [11]. These different roles and behaviors of institutional investors can significantly impact the greenwashing practices in the green bond market.

2.3. Institutional Shareholding and Green Bond Greenwashing

Long-term institutional investors, such as pension funds and ESG-focused asset managers, incentivize issuers to align with sustainability goals through mechanisms like shareholder resolutions and on-site audits. Conversely, short-term investors may lack the incentives to enforce rigorous environmental standards. This difference in investor behavior can significantly impact the prevalence of greenwashing in the green bond market. Long-term investors are more likely to engage with issuers and monitor their environmental performance, pushing for genuine sustainable practices. Their active involvement can enhance the credibility of green bonds and ensure that funds are directed toward truly environmentally friendly projects. On the other hand, the absence of such engagement from short-term investors may create opportunities for issuers to engage in greenwashing behaviors, undermining the integrity of the green bond market. Understanding these dynamics is crucial for developing strategies to mitigate greenwashing and promote sustainable investment practices [12].

3. Theoretical Analysis and Hypotheses

According to supervision effect theory, institutional investors act as informed principals, leveraging their influence to demand accountability. For example, in 2021, Harvest Fund pressured a steel manufacturer to revise misleading carbon disclosures [1]. Hypothesis 1 (H1):

Institutional shareholding is negatively associated with greenwashing. *According to collusion effect theory*, short-term investors may collude with management to obscure non-compliance, delaying negative disclosures to maximize returns. Hypothesis 2 (H2): Short-term institutional shareholding exacerbates greenwashing.

4. Research Design

4.1. Data and Sample

The study sourced data on green bond characteristics, including proceeds allocation, environmental certifications, and issuer disclosures, from the China Central Depository & Clearing Co., Ltd. Financial and governance information, like company size, profitability shown by return on equity (ROE), debt level measured by the debt-to-asset ratio, and ownership details, were collected from the Wind Database[13]. Environmental metrics, including carbon emissions, energy efficiency, and project impact assessments, were manually extracted from sustainability reports and third-party audits [2].

4.2. Variable Construction

Dependent Variable: Greenwashing Index (Must) Measured as the ratio of disclosed mandatory environmental indicators (e.g., CO2 reduction, renewable energy output) to those required by the Green Bond Environmental Benefit Disclosure Guidelines. Lower values indicate higher greenwashing risk.

Independent Variable: Institutional Shareholding Ratio Calculated as the percentage of total shares held by institutional investors at year-end.

Control Variables: Firm size (log of total assets), ROE, debt ratio, ownership concentration (Top1 shareholder), independent director ratio, and industry/year fixed effects.

4.3. Econometric Model

The baseline regression is specified as:

$$\text{Greenwashing}_{i,t} = \alpha + \beta \cdot \text{InstitutionalShareholding}_{i,t} + X_{i,t} + \varepsilon_{i,t}$$

5. Empirical Analysis

5.1. Main Regression Analysis

In the main regression analysis, a one-standard-deviation increase in institutional shareholding (18%) reduces the greenwashing index by 0.42% ($t = -3.21$), supporting H1. Long-term investors, such as social security funds, exhibit stronger effects ($\beta = -0.51$) compared to mutual funds ($\beta = -0.19$). Heterogeneity analysis reveals that in provinces with weaker environmental oversight (e.g., Qinghai), institutional governance is more pronounced ($\beta = -0.63$ vs. -0.29 in eastern regions like Shanghai). Small firms and high-pollution industries show greater responsiveness to institutional monitoring, likely due to heightened regulatory scrutiny and financing constraints. For instance, in regions with stringent regulations such as Shanghai, institutional shareholding reduces greenwashing by 0.29%, which is less significant than the 0.63% reduction observed in areas with weaker enforcement like Qinghai. Similarly, small firms and high-pollution industries demonstrate a more substantial decrease in greenwashing behavior when under institutional scrutiny, indicating that these firms are more influenced by the governance role of institutional investors [14].

Table 1 presents the regression results of institutional shareholding on greenwashing. The baseline model shows that institutional shareholding significantly reduces greenwashing behavior. The tests show two main ways that institutional shareholding helps reduce

greenwashing: first, it improves the quality of environmental disclosures by 0.70 points ($t = 5.23$), and second, it leads to an increase of 1.20 units ($t = 3.98$) in green patent filings. The heterogeneity analysis further confirms that institutional governance is more effective in regions with weaker environmental enforcement and among small firms and high-pollution industries. The control variables, firm fixed effects, and year fixed effects are included to enhance the robustness of the analysis.

Table 1. Regression Results of Institutional Shareholding on Greenwashing

Variables	Baseline Model	Mechanism Test: Supervision Pathway	Mechanism Test: Resource Pathway	Heterogeneity: Regional Enforcement	Heterogeneity: Firm Characteristics
Institutional Shareholding	-0.42*** (-3.21)	-0.38** (-2.89)	-0.41*** (-3.15)	-0.63*** (-4.02) (Qinghai)	-0.51** (-3.45) (Small Firms)
Long-Term Investors	-0.51*** (-4.12)	-	-	-	-
Short-Term Investors	-0.19* (-1.76)	-	-	-	-
Environmental Disclosure	-	0.70*** (5.23)	-	-	-
Green Patents	-	-	1.20*** (3.98)	-	-
Control Variables	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	4,023	4,023	4,023	1,205 (Qinghai)	2,418 (Small Firms)
Adjusted R ²	0.312	0.285	0.298	-	-

Note: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. The numbers in parentheses are t-statistics. The table illustrates the regression results of institutional shareholding on greenwashing behavior. The baseline model confirms the significant negative impact of institutional shareholding on greenwashing. The mechanism tests reveal the pathways through which institutional investors influence greenwashing behavior, namely supervision (environmental disclosure) and resource mobilization (green patents). The heterogeneity analysis shows regional differences and firm characteristics that affect the governance role of institutional investors in mitigating greenwashing.

5.2. Mechanism Validation

In the mechanism validation section, two primary pathways are examined. In the supervision pathway, the results show that when institutional shareholding goes up by 1%, the quality of environmental disclosure improves by 0.7 points, with 32% of this effect being due to

mediation. This suggests that institutional investors can enhance transparency and reduce information asymmetry through active oversight. In terms of resource mobilization, institutional ownership is associated with a 1.2 - unit increase in green patent filings, reflecting a 41% mediation effect. This implies that institutional investors can facilitate resource allocation and foster innovation capacity, promoting genuine sustainable development. These findings shed light on the underlying mechanisms through which institutional investors mitigate greenwashing behaviors in the green bond market.

6. Conclusion

This study combines theoretical analysis and empirical evidence to demonstrate that institutional investors' shareholding significantly curbs greenwashing behavior in the green bond market. By leveraging their supervisory and governance roles, institutional investors effectively reduce issuers' incentives to mislabel non-green projects as environmentally beneficial, thereby fostering the healthy development of the green bond market. The impact of institutional shareholding varies across market environments and firm characteristics. Notably, the current overreliance on third-party certifications in China's green bond market must transition to a dual governance mechanism that integrates market-driven discipline and external regulatory oversight.

There are some policy recommendations. First, enhance green bond standards and certification systems to improve market transparency and accountability. Integrate ESG due diligence requirements into revisions of the Securities Investment Fund Law, mandating institutional investors to disclose voting records related to green bonds. Implement real-time carbon tracking systems for bond proceeds to ensure funds are allocated to verified green projects. Establish a "greenwashing blacklist" to penalize non-compliant issuers and restrict their future access to green financing. Second, offer tax incentives (e.g., a 50% reduction in capital gains tax) for institutional investors holding green bonds for over three years. Encourage collaboration between issuers and institutional investors to improve governance and disclosure practices. Third, issuers should prioritize transparency in green bond disclosures, including detailed environmental impact metrics and third-party audit results. Strengthen internal governance mechanisms to align with institutional investors' sustainability expectations.

Future research can explore several avenues. First, it can examine how different types of institutional investors, such as pension funds, mutual funds, and foreign investors, influence greenwashing behavior. Second, the roles of credit rating agencies, auditors, and retail investors in mitigating greenwashing risks can be investigated. Third, the potential of blockchain technology to enhance traceability and immutability in green bond transactions, especially within digital currency ecosystems, can be assessed. Lastly, regulatory harmonization strategies to address greenwashing in global green bond markets can be examined, with lessons drawn from frameworks like the EU's Sustainable Finance Disclosure Regulation.

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