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A Study on the Impact of Institutional Investors' Green Attention on ESG Ratings

Yimeng Zhang*

School of Economics & Management, Nanjing University of Science & Technology, Nanjing, China

*Corresponding author: zhangyimeng2018@njust.edu.cn

Abstract. Against the backdrop of the global green transition and China's dual carbon strategy, the governance role of institutional investors has become increasingly prominent. Existing research predominantly focuses on their shareholding ratios while overlooking the impact of specific environmental governance behaviours. Drawing upon agency theory, resource dependence, and the attention-based perspective, this study constructs an 'institutional investor green attention' indicator using Shanghai and Shenzhen A-share companies from 2012 to 2023 as its sample. It empirically examines the influence mechanism of this indicator on ESG ratings. Results indicate that green attention conveyed through site research by institutional investors significantly elevates corporate ESG ratings, with findings holding up under multiple robustness tests. Mechanism analysis reveals that green attention indirectly drives ESG performance by enhancing 'management environmental awareness,' forming a transmission pathway of 'external pressure – internal cognition – substantive response.' This study reveals the micro-level mechanism through which institutional investors influence corporate sustainability from a behavioural perspective, offering significant insights for deepening active ownership practices and advancing capital markets' role in serving green development strategies.

Keywords: Institutional investors' green focus; ESG ratings; management's environmental awareness.

1. Introduction

The intensification of global climate change and the deepening of sustainable development principles are driving a broad and profound green transformation of economies and societies. Against this backdrop, Environmental, Social and Governance (ESG) principles have transcended the realm of ethical investment, evolving into a new corporate evaluation framework and investment paradigm that integrates Sustainable Development Goals. This has garnered significant attention from all stakeholders. A company's ESG performance not only impacts its reputation and public image but also directly influences its financing costs, market valuation, and long-term operational resilience[1]. In China, the formulation of the strategic objectives of 'carbon peaking and carbon neutrality' has further embedded green transformation as a core requirement for high-quality development, making corporate ESG practices a pivotal link between national macro-strategies and micro-level market behaviour.

However, a glaring contradiction exists in practice: despite the widely acknowledged importance of ESG principles, the overall ESG performance of Chinese enterprises remains uneven. While some demonstrate substantive improvements, others engage in purely symbolic disclosure practices, exemplified by "greenwashing" [2]. Against this backdrop, the pressing question is how to motivate enterprises to transition from passive compliance to proactive, high-quality ESG enhancement. While traditional government regulation and public oversight remain crucial, the external governance force emanating from capital markets—particularly the role of institutional investors—is increasingly coming to the fore. Institutional investors are no longer merely providers of financial capital; they are increasingly influencing corporate strategy by exercising shareholder rights and participating in corporate governance, thereby exhibiting the behavioural characteristics of 'active ownership'.

While existing research has identified a positive correlation between institutional investor ownership and corporate ESG performance[3], the specific mechanisms underlying this relationship remain poorly understood. In recent years, academic focus has gradually shifted from the static dimension of "whether holdings exist" to the behavioural dimension of "how engagement occurs". Site research, as a key channel for direct communication between institutional investors and company management, provides an effective micro-level window for observing governance behaviour. In research, the frequency and depth of questions raised by institutional investors on environmental issues—their "green attention"—constitute proactive, visible and precise governance actions. These directly convey market expectations and pressure regarding environmental performance to management. Measuring such behavioural perspectives better reflects institutional investors' genuine governance intentions and engagement levels than mere shareholding proportions.

Against this backdrop, this study aims to transcend the traditional shareholder perspective by systematically analysing, from a behavioural standpoint, the micro-level mechanisms through which institutional investors influence corporate ESG performance. The core research question is: Does the "green attention" demonstrated by institutional investors through site research influence corporate ESG ratings, and if so, through what processes? Specifically, this study will first examine the direct effect of green attention on ESG ratings. Subsequently, it introduces "management environmental awareness" as a key mediating variable, exploring its bridging role within the transmission pathway of "external pressure → internal cognition → substantive response" to reveal the underlying mechanism.

This study holds significant theoretical value and practical implications. Theoretically, by constructing the behavioural dimension of "green attention", it deepens our understanding of institutional investors' governance mechanisms. By linking external governance with internal cognitive processes, it unlocks the "black box" of influence pathways, organically integrating agency theory with higher-order theories. Furthermore, it provides new evidence from the Chinese context for research on ESG drivers. Practically, the findings offer empirical foundations and decision-making guidance for institutional investors to refine responsible investment strategies, listed companies to enhance ESG management effectiveness, and regulators to channel market forces towards serving the dual carbon goals.

2. Theoretical Foundations and Hypothesis Formulation

2.1. Core Concept Definition: Institutional Investors' Green Attention

Institutional investors' "green attention" refers to the focus and oversight efforts they dedicate to environmental issues (such as climate change, pollution emissions, resource consumption, and biodiversity) during their engagement in corporate governance. This manifests specifically through the frequency, depth, and professional calibre of environmental inquiries directed at management during interactions such as site research, shareholder meeting Q&As, and shareholder proposals. Such engagement constitutes proactive, visible, and targeted governance activity that transcends passive shareholding screening or traditional models focused solely on financial performance. It directly conveys market expectations and pressure regarding environmental performance to management, serving as a crucial means for institutional investors to exercise 'active ownership'.

Traditional corporate governance research has predominantly centred on the role of institutional investors in enhancing financial performance, fostering innovation, and curbing managerial opportunism[4]. Green Attention broadens the governance perspective beyond shareholder value maximisation to encompass the internalisation of environmental externalities and oversight of corporate sustainability. It represents the concrete implementation of responsible investment and sustainable development principles at the micro level. Compared to small and medium-sized investors, institutional investors possess greater professional expertise, informational advantages and bargaining power, enabling them to more effectively identify and guide companies in addressing

long-term environmental risks[5]. Against the backdrop of China's dual carbon goals, this initiative is not merely a spontaneous market activity but also a vital vehicle for responding to national strategy and guiding capital allocation.

2.2. Institutional Investors' Green Attention and ESG Ratings

ESG ratings, as a comprehensive assessment of a company's environmental, social and governance performance, directly influence its financing costs and market reputation. Institutional investors can influence ESG ratings through the following mechanisms:

Firstly, based on agency theory and signalling mechanisms, institutional investors mitigate agency conflicts between shareholders and management over long-term value versus short-term gains through 'voting with their hands' (e.g., supporting environmental resolutions) and 'voting with their mouths' (e.g., conducting research and posing inquiries). Frequent and professional environmental inquiries send clear signals to management, compelling them to enhance environmental governance and disclosure to maintain share prices and secure their positions. This consequently elevates ESG ratings, particularly within the environmental (E) dimension[6]. Song Cheng and Li Jigang (2025) also demonstrate through their research on Chinese listed companies that institutional investor engagement can enhance corporate ESG performance. This improvement is achieved primarily through three pathways: increasing information transparency, reducing earnings management, and boosting corporate innovation investment[7].

Secondly, according to resource dependency theory, institutional investors—such as large public funds, social security funds, and Qualified Foreign Institutional Investors (QFII)—function as hubs for information and resources. They can introduce advanced environmental expertise, technical channels, and policy interpretations to enterprises. Through research and engagement, they assist companies in addressing environmental management shortcomings, identifying transformation opportunities, and thereby enhancing ESG ratings.

Accordingly, this paper proposes Hypothesis One:
H1: Institutional investors' green attention can enhance corporate ESG ratings.

2.3. The Mediating Role of Management Environmental Awareness

Whether external pressure from institutional investors can translate into substantive improvements in corporate ESG performance hinges critically on management's receptiveness and responsiveness. Management environmental awareness denotes senior leadership's recognition of environmental issues, the degree of importance accorded to them, and their willingness to integrate these concerns into strategic decision-making. According to higher-order theory, corporate strategy and behaviour reflect the cognitive patterns and allocation of attention within the senior management team[8]. Where management demonstrates weak environmental awareness, external pressure may merely trigger "greenwashing" rather than substantive improvements.

The green attention of institutional investors serves as a crucial external mechanism for enhancing management's environmental awareness. On the one hand, professional and persistent environmental inquiries can prompt management to shift their attention from short-term financial objectives towards long-term environmental risks, thereby increasing their prioritisation of environmental issues. On the other hand, the question-and-answer process itself provides management with an opportunity to learn and internalise environmental knowledge, thereby deepening their environmental consciousness.

Enhanced environmental awareness will drive management to take substantive actions, such as refining environmental protection systems, setting emission reduction targets, and conducting environmental training. The eight dimensions constructed by Zhao Qinna and Li Hang[9]– encompassing aspects like philosophy, systems, and actions – represent the concrete manifestation of such initiatives. These institutionalised and systematic measures can be recognised by ESG rating agencies, ultimately manifesting as improved scores. Consequently, institutional investors' green

focus influences management's environmental awareness by “awakening” or “reinforcing” it, thereby affecting their decisions and actions, and ultimately enhancing ESG ratings.

Accordingly, this paper proposes Hypothesis 2:

H2: Management environmental awareness mediates the relationship between institutional investors' green attention and ESG ratings.

3. Research Design

3.1. Samples and Data

The Shenzhen Stock Exchange established the ‘Interactive Easy’ platform, which commenced operations in 2010, thereby creating a direct communication channel between listed companies and investors. Given that disclosure requirements were incomplete during the platform's initial operational phase, the earliest available data on listed companies' site research activities dates back to 2012. Consequently, this study selects Shanghai and Shenzhen A-share listed enterprises from 2012 to 2023 as its initial research sample. The data primarily originates from the Guotai An database (CSMAR) and the China Research Data Service Platform (CNRDS). Following acquisition of the raw data, the sample underwent processing according to the following procedures: (1) Exclusion of financial sector companies; (2) Exclusion of companies designated as ST or *ST; (3) Removal of observations with missing values. This yielded a final dataset comprising 9,904 firm-year observations. To mitigate the impact of extreme values, the primary continuous variables were trimmed at the 1% and 99% quantiles.

3.2. Variable Definitions

3.2.1. Dependent variable

The dependent variable in this study is the enterprise's overall environmental, social and governance (ESG) performance, measured using the Bloomberg ESG Disclosure Score (*ESG*).

The Bloomberg ESG Score is a comprehensive assessment framework designed to quantify listed companies' disclosure quality and performance across three dimensions: Environmental (E), Social (S) and Governance (G). Within the Environmental (E) dimension, it focuses on carbon emissions, water usage, waste management and biodiversity conservation; The Social (S) dimension encompasses employee rights, supply chain management, customer relations, and community contributions; while the Governance (G) dimension examines board structure and independence, business ethics, and shareholder rights. Its scoring framework is based on publicly disclosed ESG reports, official website information, annual financial statements, and other publicly available documents. Through systematic data extraction and analyst verification, over 120 specific indicators undergo standardised calculation and weighted aggregation, ultimately yielding a continuous composite score ranging from 0.1 to 100. A higher score indicates more comprehensive ESG disclosure and superior management practices and performance in sustainable development.

The selection of this metric is primarily based on three considerations. Firstly, the Bloomberg ESG Score possesses a high degree of objectivity and comparability. Its data sources are derived entirely from publicly disclosed information, and the assessment process adheres to a unified standardised framework. This effectively mitigates potential biases arising from subjective judgements, enabling meaningful cross-comparisons between enterprises across different industries and regions. Secondly, the rating enjoys widespread recognition and adoption within academic and investment circles, possessing considerable authority and consensus. It thus serves as a robust representation of the market's overall assessment of corporate ESG performance. Finally, as a continuous variable, the Bloomberg ESG Score captures subtle nuances in corporate ESG performance, providing richer information and enhanced statistical power for empirical analysis.

3.2.2. Explanatory variable

The core explanatory variable in this study is institutional investor green attention (*GreAttn*). To accurately capture the attention resources allocated by institutional investors to environmental issues during their engagement in corporate governance, this paper constructs an objective metric based on site research texts, drawing upon the relevant research of Zhang Yun and Yang Zhenyu[10].
The specific process for constructing the indicators is as follows:

Firstly, an environmental protection keyword dictionary was constructed. To ensure the comprehensiveness and accuracy of the keyword set, this paper drew upon the established text analysis methodology of Qian Ming et al. [11], employing a strategy combining 'seed word expansion' with 'manual verification'. Specifically, using the core seed word 'environmental protection' as a foundation, a large-scale pre-trained word vector model publicly available from Tencent AI Lab was utilised. Through semantic similarity calculations, this automatically expanded and generated a set of candidate words. Subsequently, through manual review and deduplication, irrelevant or highly ambiguous terms were removed, ultimately forming the 'Environmental Protection Keyword Dictionary' for text recognition. This dictionary encompasses core environmental issue terms such as 'haze, energy conservation, emission reduction, ecological conservation, and carbon emissions,' demonstrating sound content validity.

Secondly, identifying and quantifying green attention activities. The primary data for this study is sourced from the Investor Research Relationship Activity Record Form within the Guotai An (CSMAR) database. To focus on scenarios demonstrating the greatest depth of interaction and governance significance, the sample is restricted to site research activities conducted by institutional investors at listed companies. This excludes telephone conferences, online meetings, earnings briefings, and other non-face-to-face communication scenarios.

During data preprocessing, this study extracted the corresponding content of 'investor questions' and 'company responses' from each survey activity as independent observation units. Subsequently, utilising RStudio software and the previously constructed environmental keyword dictionary, regular expression matching was applied to each 'investor question' field. Should any question contain an environmental keyword from the dictionary, it was classified as a 'green attention' behaviour.

Ultimately, the explanatory variable *GreAttn* in this paper is defined as follows: the cumulative number of research reports identified as containing environmental issues (i.e., independent research activity records containing at least one green question) among all site research activities conducted by institutional investors towards a listed company within a single year. A higher value indicates greater attention paid by institutional investors to the company's green governance.

3.2.3. Mediating variable

The mediating variable in this study is managerial environmental awareness (*MEA*), which captures the level of environmental issue recognition and strategic prioritisation among corporate management. According to the Attention-Based View, managerial decisions and actions are largely determined by the allocation of attention resources. Consequently, managerial environmental awareness fundamentally reflects the willingness and capacity to direct limited attention towards environmental management and to internalise it within the corporate strategic agenda.

To operationalise this construct objectively and measurably, this paper draws upon established measurement methodologies from existing research, employing content analysis to construct a comprehensive indicator of management environmental awareness (*MEA*). The underlying logic of this approach is that management's intrinsic prioritisation of environmental issues will inevitably manifest as systematic disclosure of specific environmental philosophies, systems, and actions within the company's various reports and public communications. The more thorough and comprehensive the disclosure, the stronger the indication of management's environmental awareness.

Based on this, this paper references Zhao Qinna and Li Hang[9], scoring enterprises according to whether they disclose their environmental philosophy, environmental objectives, environmental management system framework, environmental education and training, special environmental initiatives, environmental incident emergency response mechanisms, environmental honours or awards, and the 'three simultaneous' system. For each dimension, if the enterprise explicitly discloses this information in its annual report, it is awarded 1 point; if not disclosed, it is awarded 0 points. The sum of scores across these eight dimensions yields the Management Environmental Awareness (*MEA*) indicator, ranging from 0 to 8. A higher score indicates more systematic management recognition of environmental issues, greater prioritisation of environmental concerns, and a stronger tendency to integrate environmental management into the company's long-term strategic framework. This multi-dimensional, verifiable measurement approach effectively avoids the limitations of single-indicator assessments, thereby providing a more robust characterisation of this critical intermediary mechanism.

3.2.4. Control variables

Drawing upon prior research in institutional investor site research and corporate ESG ratings, this paper further controls for other factors potentially influencing corporate ESG ratings. These include company age (*Age*), asset size (*Size*), leverage ratio (*Lev*), cash flow status (*Cash*), return on assets (*Roa*), return on equity (*Roe*), Tobin's Q ratio (*TQ*), ownership structure (*SOE*), institutional investor ownership (*Institute*), dual role of chairman and CEO (*Dual*), management shareholding (*Manage*), board size (*Boardsize*), proportion of independent directors (*Independent*), and largest shareholder ownership (*Top1*). Year and industry effects are also controlled for. Key variable definitions are presented in Table 1.

Table 1. Variable definition

Variable Type	Variable Name	Variable Definition and Measurement Method
Dependent variable	*ESG*	Bloomberg ESG Disclosure Score
Explanatory variable	*GreAttn*	Number of research reports produced by institutional investors following site research into environmental issues
Mediating variable	*MEA*	Referencing Zhao Qinna and Li Hang[9], companies are scored based on whether they disclose their environmental philosophy, environmental objectives, environmental management system framework, environmental education and training, special environmental initiatives, environmental incident emergency response mechanisms, environmental honours or awards, and the 'three simultaneous' system. Each item is worth 1 point, totalling 8 points.
Control variables	*Age*	Years since company listing = Observation year - IPO year
	Size	The natural logarithm of total assets at year-end
	Lev	Total liabilities at year-end / Total assets at year-end
	Cash	Net cash flow from operating activities / Total assets at beginning of period
	Roa	Net profit at the end of the period / Total assets at the end of the period
	Roe	Net profit at year-end / Shareholders' equity balance
	TQ	Market capitalisation A / Total assets
	SOE	If the company is state-owned, the value is 1; otherwise, it is 0
	Institute	Proportion of listed company shares held by institutional investors
	Dual	If the chairman and general manager are the same person, the value is 1; otherwise, it is 0
	Manage	Ratio of shares held by directors, supervisors and senior management to total shares
	Boardsize	Number of directors on the board
	Independent	Ratio of independent directors to total board size
	Top1	Shareholding ratio of the largest shareholder
	Year	Year dummy variable
	Ind	Ind dummy variable

3.3. Model Design

To empirically test the research hypotheses proposed earlier, this paper constructs the following econometric model. First, to examine Hypothesis H1 (the direct effect of institutional investors' green focus on corporate ESG ratings), a benchmark regression model (1) is established.

$$ESG_{i,t} = \alpha_0 + \alpha_1 GreAttn_{i,t} + \alpha_2 Controls_{i,t} + Year + Ind + \varepsilon_{i,t} \quad (1)$$

Where subscripts i and t denote listed companies and years respectively. The dependent variable $ESG_{i,t}$ represents the company's Bloomberg ESG composite score for year t. The core explanatory variable $GreAttn_{i,t}$ denotes the level of green attention received by the company from institutional investors in year t, specifically the number of site research reports containing environmental issues. α_1 is the central coefficient of interest in this model. If it is significantly positive, it indicates that institutional investors' green attention can indeed enhance a company's ESG rating, thereby supporting hypothesis H1.

$Controls_{i,t}$ denotes a set of firm-level control variables that may influence corporate ESG ratings, thereby mitigating omitted variable bias. Concurrently, the model incorporates a year fixed effect (Year FE) to account for macroeconomic cycles and common policy shocks, alongside an industry fixed effect (Ind FE) to control for industry-specific heterogeneity that remains constant over time. $\varepsilon_{i,t}$ represents the random error term.

4. Empirical Findings

4.1. Descriptive Statistics

Table 2 presents the descriptive statistics for the primary variables in this study, with a total of 9,904 observations in the sample. By examining the fundamental distribution characteristics of each variable, one can form an initial understanding of the overall sample data prior to empirical testing.

Table 2. Descriptive statistical results

Variable	N	Mean	SD	Min	p50	Max
ESG	9904	31.29	9.901	9.091	29.62	78.41
GreAttn	9904	0.0280	0.336	0	0	11
Age	9904	14.36	7.137	2	15	29
Size	9904	23.30	1.287	20.60	23.20	26.91
Lev	9904	0.480	0.197	0.0760	0.490	0.884
Cash	9904	0.0680	0.0790	-0.152	0.0620	0.320
Roa	9904	0.0430	0.0580	-0.172	0.0370	0.217
Roe	9904	0.0710	0.131	-0.685	0.0790	0.342
TQ	9904	1.970	1.408	0.803	1.482	8.790
SOE	9904	0.501	0.500	0	1	1
Institute	9904	53.57	22	3.167	56.19	92.97
Dual	9904	0.210	0.407	0	0	1
Manage	9904	6.925	14.29	0	0.0480	63.52
Boardsize	9904	8.939	1.805	5	9	15
Independent	9904	37.50	5.394	33.33	36.36	57.14
Top1	9904	36.59	15.91	8.990	34.88	76.95

Firstly, the mean value of the dependent variable, corporate ESG ratings (ESG), was 31.29 with a standard deviation of 9.901. The minimum and maximum values were 9.091 and 78.41 respectively, while the median (29.62) was slightly below the mean. This distribution pattern indicates that the overall ESG performance of Chinese A-share listed companies during the sample period was moderately low, with significant heterogeneity among firms. Half of the companies scored below 30

points, reflecting considerable scope for improvement in ESG practices and disclosure quality among listed firms in China. Concurrently, the substantial numerical range provides essential variability for subsequent empirical analysis.

The mean value of the core explanatory variable Institutional Investor Green Attention (*GreAttn*) is 0.028, with a standard deviation of 0.336 and a median of 0. This result clearly reveals that, during the sample period, the vast majority of listed companies did not receive any institutional site research incorporating environmental issues within a year. However, its maximum value of 11 indicates that a very small number of companies received intensive green attention from institutional investors. This right-skewed distribution, characterised by 'mostly zeros with a few high points', aligns with the reality that institutional investors' research activities often concentrate on specific companies. It also indirectly validates the necessity of shifting the research perspective from 'shareholding status' to 'specific behavioural patterns'.

Regarding the distribution of company financial characteristics as control variables, the data is broadly reasonable. The mean for company size (*Size*) stands at 23.30 with a standard deviation of 1.287, indicating that variations in sample company size remain within manageable limits. The mean debt-to-asset ratio (*Lev*) is 0.480, closely aligning with the overall debt levels of listed companies in China. The two profitability indicators, Return on Assets (*Roa*) and Return on Equity (*Roe*), had mean values of 0.043 and 0.071 respectively. However, the standard deviation for *Roe* (0.131) was significantly greater than that for *Roa* (0.058), with *Roe* exhibiting a minimum value below zero. This indicates substantial variation in shareholder equity returns across firms, suggesting profitability fluctuations in certain companies. The mean value for ownership structure (*SOE*) was 0.501, indicating that the sample contained roughly equal numbers of state-owned and non-state-owned enterprises, thus demonstrating good representativeness.

The statistical findings regarding corporate governance variables also reveal significant characteristics. The mean institutional investor shareholding ratio (*Institute*) stands at 53.57%, clearly demonstrating that institutional investors have become a substantial force within China's capital markets. The mean dual-role ratio (*Dual*) is 0.210, indicating that approximately 21% of the sample companies have a chairman and chief executive officer held by the same individual. The mean board size (*Boardsize*) was 8.939 members, while the mean proportion of independent directors (*Independent*) stood at 37.50%. Both figures comply with the relevant provisions of the Company Law and exhibit minimal variation across different companies. The mean shareholding ratio of the largest shareholder (*Top1*) was 36.59%, indicating a certain degree of equity concentration.

In summary, the descriptive statistics preliminarily indicate testable variability among the core variables, whilst the distribution patterns of the control variables align with existing research and the actual conditions of China's capital markets. This establishes a sound data foundation for subsequent regression analysis.

4.2. Regression Analysis Results

4.2.1. Baseline model regression

Table 3 presents the benchmark regression results demonstrating the impact of institutional investors' green attention (*GreAttn*) on corporate ESG ratings. The model incorporates a comprehensive set of control variables and accounts for year and industry fixed effects. The adjusted R^2 stands at 0.600, indicating the model possesses satisfactory explanatory power.

Table 3. Baseline regression results

VARIABLES	(1) *ESG*
GreAttn	0.465**
	(2.01)
Controls	Yes
Year	Yes
Ind	Yes
R-squared	0.600
Observations	9,903

Robust t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Firstly, the regression coefficient for the core explanatory variable, institutional investor green attention (*GreAttn*), is 0.465 and statistically significant at the 5% level (t-value of 2.01). This result strongly supports the study's research hypothesis H1: that the level of green attention from institutional investors exhibits a significant positive correlation with corporate ESG ratings. This finding confirms, from a behavioural perspective, that environmental governance pressure and attention exerted by institutional investors through direct engagement channels such as site research can effectively translate into substantive improvements in corporate ESG performance, rather than merely symbolic shareholding associations. It provides direct micro-level evidence for institutional investors' role in exercising ‘active ownership’ to drive investee companies towards sustainable development practices.

The regression results for most control variables were statistically significant, with coefficient directions broadly consistent with existing literature, further enhancing the credibility of the model specification.

4.2.2. Mechanism verification

To test H2, namely whether management environmental awareness (*MEA*) mediates the relationship between institutional investors' green attention and corporate ESG ratings, this study employs stepwise regression analysis following Jiang Ting's [12] proposed mediation effect testing procedure. Table 4 presents the regression results from the mediation test.

Table 4. Mechanism verification of regression results

VARIABLES	(1) *ESG*	(2) *MEA*
GreAttn	0.412*	0.039**
	(1.80)	(2.03)
Controls	Yes	Yes
Year	Yes	Yes
Ind	Yes	Yes
R-squared	0.606	0.309
Observations	9,318	9,318

Robust t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Firstly, column (1) reports the impact of institutional investors' green attention (*GreAttn*) on corporate ESG ratings (*ESG*). The results indicate that the coefficient for *GreAttn* is 0.412, significant at the 10% statistical level (t-value of 1.80), consistent with the main regression findings.

Secondly, column (2) reports the regression results for institutional investors' green attention (*GreAttn*) on the mediating variable of management environmental awareness (*MEA*). This constitutes a crucial step in testing the mediating effect, verifying whether external governance pressure can effectively influence internal management perceptions. The results indicate that the coefficient for *GreAttn* is

0.039, and is significantly positive at the 5% level (t-value of 2.03). This provides strong evidence that external green attention from institutional investors can effectively "awaken" or "reinforce" management's focus on environmental issues, prompting them to allocate greater attention resources to environmental management. This heightened awareness manifests through concrete measures such as establishing environmental objectives, implementing policies, and providing training.

Taking the above findings together, institutional investors' green attention (*GreAttn*) significantly enhances management environmental awareness (*MEA*). Substantial research confirms that heightened management environmental awareness systematically drives companies to improve their environmental performance and ESG outcomes. Firstly, companies with higher management environmental awareness are more inclined to systematically disclose environmental objectives, management practices, and performance data (such as environmental training, pollution prevention measures, and carbon emissions data). This directly aligns with ESG rating agencies' assessment requirements for the 'environmental dimension'. Secondly, heightened environmental awareness drives companies to proactively address environmental compliance risks (such as climate change and pollution penalties) and strategic risks (such as resource inefficiency), optimising resource allocation through green innovation (e.g., investments in environmental technologies and circular economy models). This strategic commitment to sustainability is recognised by ESG rating agencies as an indicator of long-term resilience, thereby enhancing ratings[13].

In summary, the findings of this mechanism test indicate that management's environmental awareness mediates the relationship between institutional investors' green attention and corporate ESG ratings. Specifically, institutional investors' green attention not only directly influences corporate ESG ratings but also indirectly promotes improvements in these ratings by enhancing management's environmental awareness through an internal psychological cognitive pathway. Hypothesis H2 is thus empirically supported.

4.3. Robustness Tests

4.3.1. Replacement of explanatory variables

To ensure the reliability of the benchmark regression conclusions, this study first conducted robustness tests by altering the measurement approach of the core explanatory variable. As previously noted, the institutional investor green attention (*GreAttn*) employed in the benchmark regression is a continuous variable measuring the absolute number of site research involving environmental issues received by listed companies within a year. While this metric accurately reflects the intensity of green attention, its distribution may exhibit right skewness. To verify whether the research conclusions are influenced by the specific measurement method of this variable, this test draws upon a commonly used academic approach by constructing a dummy variable, *GreDum*, as a new explanatory variable. This variable is defined as follows: a company receives a value of 1 if it undergoes at least one site research by institutional investors covering environmental issues during a given year, and 0 otherwise. This measurement focuses on the presence or absence of green attention, capturing the existence of institutional investors' environmental governance activities. It thereby provides an alternative perspective to validate the robustness of the main effect.

Table 5. Regression results for the replacement explanatory variable

VARIABLES	(1) *ESG*
GreDum	1.541**
	(2.02)
Controls	Yes
Year	Yes
Ind	Yes
R-squared	0.600
Observations	9,903

Robust t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 5 presents the regression results with *GreDum* as the core explanatory variable. The findings indicate that *GreDum*'s coefficient is 1.541 and statistically significant at the 5% level (t-value of 2.02). This finding further reinforces the core argument of this paper. Firstly, it demonstrates that the positive governance effects of institutional investors' green attention are remarkably robust. The positive correlation between such attention and ESG ratings persists consistently, whether measured by the frequency of attention (*GreAttn*) or the mere presence of attention behaviour (*GreDum*). Secondly, the use of dummy variables mitigates potential interference from extreme values or non-linear relationships inherent in continuous variables, thereby stabilising the estimation results. Finally, this test qualitatively confirms that even occasional, one-off instances of green attention suffice to send a strong signal to management and yield significant economic consequences. This underscores both the necessity and effectiveness of institutional investors' active engagement in corporate environmental governance.

In summary, by replacing continuous explanatory variables with dummy variables in the regression analysis, the primary conclusion of this study—that institutional investors' green attention contributes to enhancing corporate ESG ratings—remains robustly established. Hypothesis H1 is once again supported by the empirical findings.

4.3.2. Replacement of dependent variable

To further enhance the reliability of the research conclusions, this study conducted a second robustness test: replacing the measurement method of the dependent variable. In the benchmark regression, corporate ESG performance was measured using the Bloomberg ESG Disclosure Score. Whilst this metric offers internationally recognised and continuous advantages, differences exist among ESG rating agencies in their assessment frameworks, indicator weightings, and data sources. To ensure findings are not dependent on any single rating system, this test employs the SynTao Green Finance ESG Rating as an alternative measurement.

SynTao Green Finance is a domestically influential ESG rating agency in China, whose assessment framework deeply integrates policy orientations and practical contexts within the Chinese market. For quantitative analysis, this paper converts its letter grades (e.g., A+, B-) into a continuous numerical score (*ESG*_score) based on a standardised hierarchy of performance, where higher scores indicate superior ESG performance. This conversion enables the qualitative ratings from SynTao Green Finance to be quantified for use in regression models.

Table 6. Regression results for the replacement dependent variable

	(1)
VARIABLES	*ESG_score*
GreAttn	0.072***
	(2.71)
Controls	Yes
Year	Yes
Ind	Yes
R-squared	0.318
Observations	4,193

Robust t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 6 presents the regression results with SynTao Green Finance's ESG score (*ESG_score*) as the dependent variable. Findings indicate that the coefficient for the core explanatory variable, institutional investors' green attention (*GreAttn*), stands at 0.072 and is highly significant at the 1% statistical level. This outcome provides robust corroboration for the findings from the benchmark regression.

This finding carries significant implications for robustness. Firstly, it demonstrates that the positive influence of institutional investors' green attention on corporate ESG performance does not undergo

qualitative change due to alterations in ESG rating systems. Whether using the internationally oriented Bloomberg Score or the localised SynTao Green Finance rating as the benchmark, the green governance pressure conveyed by institutional investors through site research effectively translates into enhanced corporate ESG performance. This substantially enhances the universality and credibility of the research findings.

5. Conclusions and Implications

5.1. Research Conclusions

This paper, grounded in the practical context of China's capital market undergoing a “green transition”, deepens the research perspective from institutional investors' “shareholdings” to their “behaviour”. It systematically examines the impact of institutional investors' “green attention” conveyed through site research on corporate ESG ratings, along with the underlying mechanisms at play. Through empirical analysis of A-share listed companies from 2012 to 2023, the study primarily draws the following conclusions.

Firstly, institutional investors' green attention activities can significantly enhance a company's ESG rating. Regression analysis reveals that, after controlling for corporate financial and governance characteristics alongside year and industry fixed effects, the coefficient for the core explanatory variable “green attention (*GreAttn*)” is significantly positive at the 5% level. This indicates that institutional investors' questioning and interaction on environmental issues during site research is not merely perfunctory, but constitutes an effective informal governance mechanism. Such behaviour directly conveys market expectations and pressure regarding environmental performance to corporate management, prompting substantive improvements in environmental management, disclosure practices, and related governance structures. These enhancements are ultimately recognised and acknowledged by ESG rating systems. This conclusion remains highly robust after robustness tests, including replacing the explanatory variable with a dummy variable (*GreDum*) indicating whether *GreAttn* is present and substituting the dependent variable with the local SynTao Green Finance ESG score, thereby validating the reliability of the research findings.

Secondly, this study reveals the inherent cognitive black box through which institutional investors' green attention exert their influence, wherein “management environmental awareness” plays a pivotal mediating role. Mechanism testing results indicate that institutional investors' green attention not only exerts a direct effect on ESG ratings but also significantly enhances management's environmental awareness. Specifically, frequent and specialised environmental enquiries compel management to allocate scarce attention resources towards long-term environmental risks and green opportunities. Through a ‘learning by doing’ mechanism, this process deepens their understanding of environmental management. This heightened awareness externalises into institutionalised actions, such as establishing environmental targets, refining environmental systems, and conducting environmental training. These substantive actions form the microfoundation for improving corporate environmental (E) performance metrics, ultimately captured by ESG ratings. This finding organically links external corporate governance (institutional investor behaviour) with internal strategic decision-making (management cognition), confirming the existence of the transmission pathway: ‘external pressure → internal cognition → concrete action.’ It represents a valuable integration of agency theory, resource dependence theory, and the attention-based perspective.

In summary, the core finding of this study is that the green attention demonstrated by institutional investors through site research constitutes a significant governance force driving improvements in corporate ESG performance. This influence is partially achieved by awakening and reinforcing management's intrinsic environmental awareness. At the micro level of behaviour and cognition, this provides new evidence for understanding how capital markets in the Chinese context can facilitate the green transition of the real economy.

5.2. Research Implications

Based on the aforementioned research findings, this paper derives the following targeted implications. For institutional investors, the findings of this study encourage a more proactive and professional approach to exercising “active ownership”. Firstly, institutional investors should recognise that their influence over the governance of investee companies stems not only from capital strength, but also from deep engagement and effective interaction. During site research, they should consciously and systematically incorporate scrutiny of ESG issues such as environmental concerns, transforming green attention from spontaneous actions into deliberate strategies. Secondly, emphasis should be placed on enhancing the professional depth of research to avoid superficial discussions. By posing precise, cutting-edge environmental questions, management can be guided towards strategic thinking, thereby more effectively conveying market expectations and driving substantive green transformation within enterprises.

For listed companies and corporate management, institutional investors' green attention should be viewed correctly as a valuable opportunity to optimise internal governance and enhance long-term competitiveness, rather than merely as a compliance pressure. Management should proactively strengthen communication with institutional investors, actively respond to their environmental enquiries, and treat this as a learning process to identify gaps in their environmental management and learn from best practices. More importantly, companies should establish long-term mechanisms to transform external green pressure into internal management momentum. For instance, by incorporating environmental performance into executive assessment systems and conducting regular environmental strategy evaluations, they can embed heightened environmental awareness into sustainable strategies and actions.

For policymakers and regulatory bodies, this study provides empirical evidence to guide capital markets in serving the nation's dual carbon strategy. Regulators may consider further refining relevant policies and regulations to encourage and support institutional investors in exercising shareholder activism. For instance, guidance documents could be issued advocating that institutional investors prioritise long-term risks and ESG factors when engaging in corporate governance. Disclosure rules should be refined to require listed companies to provide more detailed accounts of their communications with institutional investors on ESG matters and the subsequent implementation of improvements. By establishing a virtuous governance ecosystem driven by market forces, corporate responsiveness, and regulatory guidance, capital flows can be more effectively channelled towards green and sustainable sectors, thereby fostering a concerted effort to propel high-quality economic development.

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