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Detecting Greenwashing: An Analysis of ESG Disclosures and Regulatory oversight in India

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ABSTRACT:

Purpose: This study examines how Environmental, Social, and Governance (ESG) disclosure practices and regulatory mechanisms influence perceived greenwashing and employee-related organizational outcomes in Indian organizations. It investigates the effects of ESG disclosure quality, ESG transparency, regulatory oversight, and ESG assurance on employee trust, employer attractiveness, and organizational reputation, considering the mediating role of perceived greenwashing and the moderating role of regulatory compliance.

Methodology: A quantitative research design was adopted using primary data collected from 181 employees of ESG-reporting organizations across India and secondary data from ESG reports, BRSR filings, annual reports, SEBI publications, and literature. Data were analyzed using SPSS and AMOS/SmartPLS through reliability, validity, correlation, regression, CFA, SEM, mediation, and moderation analyses.

Findings: ESG disclosure quality significantly reduced perceived greenwashing ($\beta = -0.31, p < 0.001$), while ESG transparency improved employee trust ($\beta = 0.42, p < 0.001$). Regulatory oversight negatively influenced perceived greenwashing ($\beta = -0.18, p = 0.017$), and ESG assurance positively affected organizational reputation ($\beta = 0.36, p < 0.001$). Employee trust enhanced employer attractiveness ($\beta = 0.49, p < 0.001$). Perceived greenwashing partially mediated the relationships (indirect effect = 0.13, $p = 0.002$; indirect effect = 0.11, $p = 0.004$), while regulatory compliance strengthened the negative relationship between ESG disclosure quality and perceived greenwashing ($\beta = -0.17, p = 0.006$).

Practical Implications and Originality: The findings highlight the importance of transparent ESG reporting, independent assurance, and regulatory compliance. The study extends Extended Signaling Theory by providing employee-centered evidence on ESG credibility in the Indian context.

1. INTRODUCTION

ESG practices have become a fundamental part of corporate sustainability practices in recent years, influencing the way companies communicate their responsibilities in terms of environment, society, and governance. Non-financial disclosure, including reports on environmental, social, and governance (ESG) issues, is gaining significance to show the commitment of firms in terms of sustainability (Daga et al., 2025). But questions have been raised about the authenticity of these disclosures, including the phenomenon of greenwashing, which occurs when companies overstate or selectively report their sustainability gains while hiding the negative effects (Davidescu, 2026; Den et al., 2024). These practices leave a gap between claims and performance and can lead to loss of trust among stakeholders. These disclosures are critical for employees, who are internal

stakeholders in the organization, to interpret, and consequently develop perceptions about the credibility of the organization, thereby affecting trust and attitudes at the work place (Dhar & Imran, 2026).

ESG reporting has grown substantially in India on the back of regulatory moves to enhance corporate transparency. But the quality of disclosure, transparency, assurance and compliance still poses a problem for the credibility of sustainability reporting (Florstedt et al., 2025; Gidage et al., 2025). ESG disclosure quality contributes to the accuracy and evidence-based nature of sustainability information, while ESG transparency fosters credible reporting by making it easier to report the positive and negative impacts of ESG (Hao et al., 2026). In addition, the regulatory supervision and ESG assurance enhance accountability through standard levels of reporting and verification of sustainability claims, which mitigates information asymmetry and boosts trust in ESG communication (Lestari et al., 2026).

Although the field of ESG practices is gaining attention, there is still less research on the employee's level of perception of ESG authenticity and identification of greenwashing, especially in the Indian context. The majority of previous studies have focused on the external stakeholders, namely investors, while the internal stakeholders (employees) have not received sufficient attention (Lipenkova, 2026). This study fills this void by exploring the role of disclosure quality and transparency, regulatory oversight and assurance in relation to greenwashing perception and how that perception affects employee trust, employer attractiveness and organizational reputation. It also explores the role of perceived greenwashing as a mediating factor and regulatory compliance as a moderating factor. Overall, the study offers a detailed picture of the impact of ESG practices and regulatory mechanisms on employee perceptions and organizational credibility in India.

1.1 Theories

This study is based on Extended Signaling Theory, which explains that employees evaluate the credibility of an organization's ESG disclosures through signals such as disclosure quality, transparency, and assurance. Credible ESG signals reduce perceived greenwashing, enhance employee trust, improve employer attractiveness and organizational reputation, while regulatory compliance strengthens the credibility of these signals.

1.2 Problem Statement

This study addresses the limited understanding of how employees perceive ESG disclosures and greenwashing in Indian organizations. It examines how ESG disclosure quality, transparency, regulatory oversight, assurance, and regulatory compliance influence perceived greenwashing and their impact on employee trust, employer attractiveness, and organizational reputation.

1.3 Scope of the Research

The present study aims to determine the effect of the disclosure of ESG practices on the perception of greenwashing in the Indian context. It explores the employee as an internal stakeholder in various sectors, and assesses the impact of ESG disclosure quality and transparency, the regulatory framework, and assurance on employee trust, employer attractiveness and organizational reputation. The study also takes into account regulatory compliance as a strengthener of the credibility of the ESG and employs quantitative techniques such as CFA, SEM, mediation analysis and moderation analysis to test the proposed relationships.

1.4 Objectives of the Study

Primary Objective

To investigate the relationship between ESG Disclosure Practices and Regulatory Oversight on the perceived greenwashing and employee related outcomes of the companies in India.

Specific Objectives

1. To measure the effect of the quality of the ESG disclosures on employees' perception of greenwashing.
2. To explore the correlation between employee trust and ESG transparency of organizations.
3. To investigate the effect of regulatory supervision on the perceived greenwashing practices.
4. To explore the impact of ESG assurance on the reputation of the organization.

5. To explore the correlation between employee trust and employer attractiveness.
6. To test if perceived greenwashing partially mediates the relationship between ESG disclosure quality and employee trust.
7. To investigate the mediation effect of perceived greenwashing between ESG transparency and employer attractiveness.
8. To explore the moderating effect of regulatory compliance on the positive association between ESG disclosure quality and perceived greenwashing.

1.5 Research Questions

RQ1: What is the relationship between the quality of the ESG disclosures and the perception of greenwashing among employees of Indian organizations?

RQ2: What is the impact of ESG transparency on the trust of employees towards organizations that are adopting ESG practices?

RQ3: How much does regulatory regulation mitigate the perception of greenwashing in corporate ESG disclosures?

RQ4: What are the implications of ESG assurance on organizational reputation and credibility?

RQ5: How does employee trust contribute to the attractiveness of organizations with ESG commitments?

RQ6: Does perceived greenwashing mediate the relationship between ESG disclosure quality and employee trust?

RQ7: Is there a mediation effect of perceived greenwashing on the relationship between ESG transparency and employer attractiveness?

RQ8: Does the quality of ESG disclosure moderate the relationship between regulatory compliance and perceived greenwashing?

2. LITERATURE REVIEW

Previous studies emphasize the importance of ESG transparency, credibility, and accountability in reducing greenwashing. However, limited research has examined employees' perceptions of ESG disclosure authenticity, particularly in the Indian context, highlighting the research gap addressed in this study.

2.1 ESG Disclosure Quality and the Emergence of Greenwashing Risks

The quality of ESG disclosures is important because of the credibility of the communication and risk of greenwashing perceptions. Current research suggests that the lack of or inadequate, or incomplete, information regarding ESG factors raises information asymmetry and obscures the ability of stakeholders to assess real-world sustainability outcomes of an organization. De Silva Lokuwaduge and De Silva (2022) emphasized that the lack of meaningful ESG risk disclosure enables organizations to provide sustainability information in a more strategic than transparent manner, which makes greenwashing more likely to occur. Likewise, Lokuwaduge and De Silva (2022) highlighted that the lack of consistency in the ESG communication lowers the reliability of reporting and induces uncertainty for stakeholders. Hu et al. (2024) identified that the complexity and readability of ESG reports have an impact on greenwashing detection, as reports that are less clear may obscure discrepancies between sustainability claims and the actual activities. Moreover, Lestari et al. (2026) found that the differences in disclosure of ESG have an impact on perceptions of corporate authenticity. Ma et al. (2025) also found that ESG disclosures can be effective at enhancing reputation but not organizational sustainability, showing that the effectiveness of disclosures requires them to be accurate, transparent, and consistent with the organization's actual practices.

2.2 Greenwashing Detection through Artificial Intelligence and Data Analytics

AI and Data Analytics represent cutting-edge solutions for greenwashing detection, uncovering subtle patterns, inconsistencies, and deceptive ESG communication. The use of AI tools like natural language processing (NLP), machine learning and sentiment analysis enhances the effectiveness and reliability of ESG assessment over the manual approach. Kim et al. (2023) demonstrated the ability of ESG-BERT models to detect linguistic features of misleading sustainability claims, and Feng et al. proposed a multimodal AI framework for enhanced ESG report analysis. Florstedt et al. (2025) showed that machine learning can identify the disconnect between ESG statements and their actual implementation, while Wang et al. (2025) emphasized the importance of analytical tools for forecasting greenwashing. Ong et al. (2025) highlighted the importance of associating ESG

claims to organizational activity, and Sari et al. (2025), Wilson et al. (2026), and Davidescu et al. (2026) agreed that AI systems can enhance ESG monitoring, accountability, and accurate sustainability evaluation.

2.3 ESG Assurance, Auditing, and Verification Mechanisms

ESG assurance, auditing and verification mechanisms are important to enhancing the credibility and reliability of sustainability disclosures and ensure that ESG information reported reflects actual organizational practices. Independent verification minimizes information asymmetry and allows stakeholders to distinguish between what is truly sustainable and what is merely reporting. Mihaylova and Blumer (2025) emphasized that assurance practices from an auditor's perspective strengthen ESG reporting reliability by improving transparency and reducing the risk of misleading sustainability claims. In the same way, Putnam et al. (2024) noted that forensic auditing methods may reveal discrepancies between ESG claims and real sustainability results to serve as a valuable tool for spotting greenwashing. Sklavos et al. (2025) also showed that there is a potential for the greenwashing practices to be identified through the lack of alignment between ESG disclosures and the green accounting indicators. Such research clearly suggests that robust assurance and verification processes boost the credibility of the ESG disclosures, strengthen accountability, and limit the potential for misleading sustainability communication.

2.4 Regulatory Oversight and Governance Mechanisms for Preventing Greenwashing

Regulatory oversight and governance mechanisms play a crucial role in enhancing the credibility of ESG disclosures and mitigating greenwashing through accountability, reporting requirements, and monitoring. Tian and Niu (2024) noted that robust ESG governance enhances the reliability of the disclosure, mitigates the risk of symbolic sustainability reporting and promotes the reliability of disclosure. The study conducted by Daga et al. (2025) highlighted regulatory mechanisms, stakeholder pressure and organizational accountability as critical factors for combating greenwashing. Hao et al. (2026) demonstrated the potential positive impact of external monitoring on real-world ESG implementation, and Sniederiene and Legenzova (2025) pointed to transparency and assurance as areas of concern regarding the risk of greenwashing. In addition, Vihayes et al. (2025) noted a need to improve the governance, auditing and disclosure monitoring systems to enhance ESG accountability.

2.5 Greenwashing in the Indian ESG Reporting Context

Despite the growing prevalence of sustainability and regulatory efforts like the BRSR framework by SEBI, there are ongoing concerns about disclosure consistency, verification, and authenticity in the Indian ESG reporting landscape. Gidage et al (2025) studied the ESG disclosures of Nifty 50 companies and observed significant variations in disclosure quality, which could enhance the risk of greenwashing and doubts of stakeholders. Likewise, Dhar and Imran (2026) pointed out that to avoid greenwashing in India, there must be actual sustainability efforts, transparent reporting, and robust regulatory frameworks to ensure that ESG statements reflect company actions. While the studies reveal that India has taken a step forward in providing structured ESG reporting, there is a need for further research to explore how these internal stakeholders, especially employees, interpret ESG disclosures and evaluate the authenticity of the corporate sustainability commitment.

2.6 Stakeholder Perception and the Impact of Greenwashing

Stakeholder perception is important when measuring ESG communication because stakeholders are evaluating whether or not sustainability claims are real organizational actions or just a reputation-building strategy. While most of the previous research has centered on the investors, employees are also internal stakeholders who assess the authenticity of ESGs. Deng et al. (2024) concluded that the trust of stakeholders is related to the credibility and reliability of ESG information, and misleading disclosure will affect the trust of stakeholders. Lipenkova et al. (2023) found that the mismatching of ESG reports and the communication of organizations raises concerns around greenwashing and impairs stakeholder evaluations. Likewise, Poirazi et al. (2025) pointed out the issue of authenticity because of weak governance and poor ESG performance. In general, the perception of greenwashing affects stakeholder trust, organization reputation and organization perception of responsibility.

2.7 Research Gap

Existing studies mainly focus on investors and firm performance, with limited attention to employees' perceptions of ESG disclosures. Additionally, evidence on how regulatory compliance improves ESG disclosure authenticity, particularly in India, remains limited. This study addresses these gaps by examining the impact of ESG practices on greenwashing perception, employee trust, employer attractiveness, and organizational reputation.

2.8 Conceptual Framework and Hypothesis Development

The present study builds a conceptual framework that integrates the Extended Signaling Theory to highlight how the ESG practices affect employee perceptions and organizational outcomes. The framework highlights the significance of the quality and transparency of ESG disclosure, regulatory oversight, and ESG assurance as organizational signals that employees rely on to assess the authenticity of sustainability. Perceived greenwashing acts as a mediating variable that helps understand how employees understand ESG statements and assess organizational credibility. The lack of transparency, reliability, and assurance and compliance ultimately contribute to the perception of greenwashing, which increases employee trust, employer attractiveness, and organizational reputation. Enhanced regulatory compliance adds to the credibility of ESG signals, thereby increasing accountability and the transparency of sustainability promises. Conceptual Framework is shown in Figure 1.

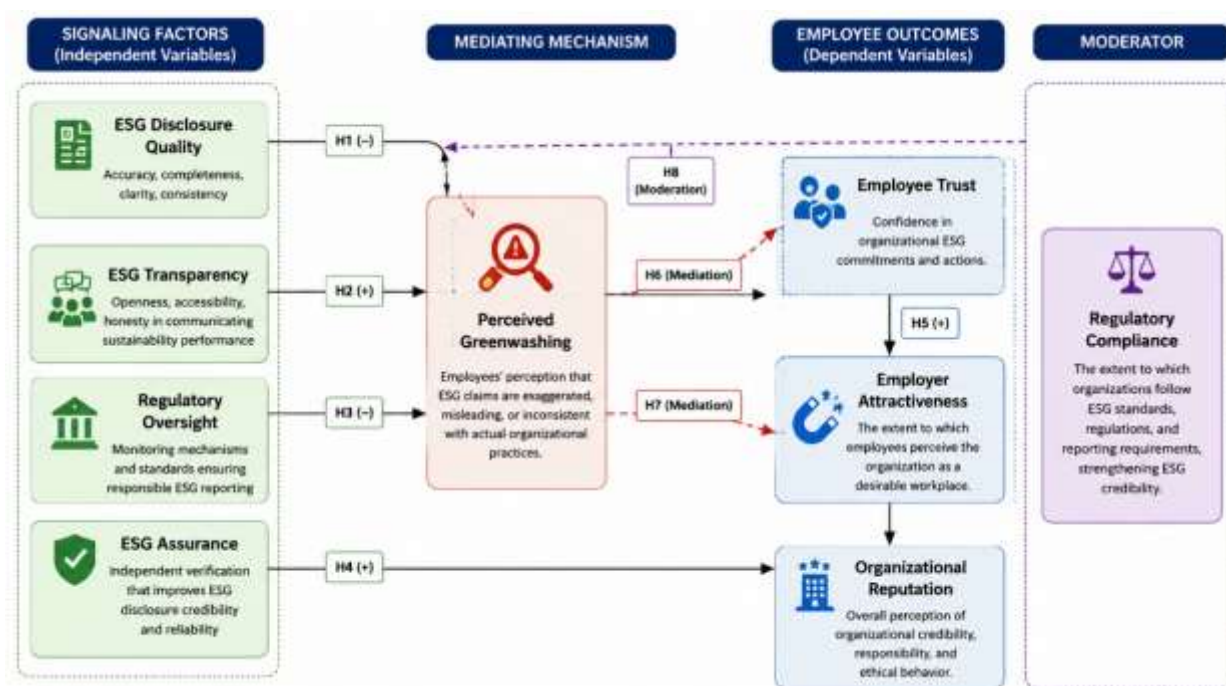


Figure 1: Conceptual Framework

Independent Variables

The independent variables of this study comprise ESG Disclosure Quality, ESG Transparency, Regulatory Oversight, and ESG Assurance. ESG Disclosure Quality focuses on the clarity, accuracy, completeness, consistency, and evidence-based nature of ESG reporting. ESG Transparency emphasizes open, honest, balanced, and accessible communication of ESG activities, risks, and sustainability performance. Regulatory Oversight refers to regulatory monitoring, enforcement of ESG reporting requirements, provision of reporting guidelines, and accountability mechanisms to reduce misleading sustainability claims. ESG Assurance involves independent verification of ESG reports to enhance the accuracy, reliability, credibility, and accountability of disclosed ESG information.

Mediating Variable

Perceived Greenwashing is when employees believe an organization's sustainability statements are false, inflated or not aligned with its ESG actions. It happens when there is a disconnect between what an organization says about sustainability and what it actually does. Perceived greenwashing is viewed as a mediating construct in this study because an employee's judgment of the authenticity of ESG practices impacts the employee trust, attitudes and responses towards the organization. It is measured by over-claiming, inappropriate communication, hiding down-sides and disconnect between sustainability statements and activities.

Dependent Variables

The dependent variables of this study are Employee Trust, Employer Attractiveness, and Organizational Reputation. Employee Trust reflects employees' confidence in the organization's ESG commitments, sustainability actions, transparency, and reliability. Employer Attractiveness represents employees' perception of the organization as a desirable workplace based on its ESG values, ethical practices, positive image, and intention to join, recommend, and remain with the organization. Organizational Reputation refers to the overall perception of the organization's credibility, ethical behaviour, transparency, social responsibility, stakeholder confidence, and commitment to sustainable business practices.

Moderating Variable

Regulatory compliance is the compliance to the laws, standards and reporting guidelines related to companies' ESG by regulatory authorities. It helps to ensure that sustainability information is made available in an accountable, consistent and transparent way. Enhanced regulatory compliance helps to ensure more reliable disclosures and build confidence among stakeholders, while minimizing misleading claims. Therefore, firms with implemented ESG regulations and monitoring practices are more likely to be seen as genuine in their sustainability activities, and to have lower perception of greenwashing.

Hypothesis Development

Direct Effect Hypotheses

H1: Quality of ESG disclosure is a significant factor in reducing the perceived greenwashing.

High-quality ESG disclosures deliver accurate, complete, and evidence-based sustainability information. When communication around ESG performance is transparent and constant, employees are less likely to find sustainability claims overstated or misleading. In turn, better quality of ESG disclosures is likely to minimize the perception of greenwashing.

H2: Trusting employees is positively impacted by ESG transparency.

Clear ESG communication evokes trust and responsibility within an organization. When workers see that organizations openly report on sustainability progress, challenges and risks, they are more confident of the organization's commitments.

H3: Regulatory supervision has a negative impact on greenwashing.

Regulatory monitoring and reporting frameworks create less opportunity to give false or inaccurate ESG information. Better oversight promotes accountability and improves the transparency of organizations in reporting sustainability data.

H4: ESG assurance has a positive impact on the reputation of the organization.

Independent assurance enhances the credibility and reliability of ESG disclosures. Sustainability reporting helps organizations build a positive reputation amongst employees and stakeholders.

H5: The degree of employee trust has a positive relationship with the attractiveness of the employer.

Employees feel more positive about the potential attractiveness of an organization if they see trust in organizational values and recognize that sustainability commitments are sincere. Better employee trust leads to greater organizational attractiveness and preference.

Mediation Hypotheses

H6: The relationship between ESG disclosure quality and employee trust is mediated by perceived greenwashing.

While disclosure quality directly affects employee trust, employees also look to see if sustainability information is credible. Ineffective or inadequate disclosure could raise the risk of greenwashing perceptions and impact employee trust. Therefore, perceived greenwashing acts as an intermediate mechanism.

H7: ESG transparency has a direct impact on employer attractiveness via perceived greenwashing.

Clear sustainability communication creates more employer attractiveness, as it decreases uncertainty and builds trust. If sustainability communication appears as a falsehood, however, the positive impact it can have on employer attractiveness may be reduced.

Moderation Hypothesis

H8: Regulatory compliance influences the relationship between ESG disclosure quality and perceived greenwashing.

By providing a structure and accountability for sustainability information, regulatory compliance will reinforce the influence of ESG disclosure quality. When disclosure quality is not equal, organizations with better compliance systems are likely to have lower greenwashing perceptions.

3. RESEARCH METHODOLOGY

3.1 Research Design

This study adopts a quantitative research design with both descriptive and explanatory components. The descriptive aspect is employed to summarize and present the characteristics of the respondents and key study variables, and the explanatory aspect is employed to examine the causal relationships between ESG disclosure quality, ESG transparency, regulatory oversight, perceived greenwashing, employee trust and employer attractiveness. The quantitative approach allows variables to be systematically measured by structured data from surveys and can be used to test hypotheses statistically.

3.2 Research Population

The study population includes employees of Indian organizations that are engaged in ESG reporting practices. The organizations include entities that are publishing formal ESG report, have adopted any sustainability reporting framework, are subject to any regulatory requirement related to ESG in India. This study is primarily undertaken for those employees across various industries, including manufacturing, information technology, banking and finance, healthcare, energy, consumer goods and others, that publish information on sustainability on a regular basis. Employees are chosen as target population as internal stakeholders, who are directly or indirectly involved in the organization's ESG practice and reporting process. This makes it easier for them to determine if the ESG statements made by their organizations are truly aligned with their operations or if there is a mismatch that could be considered greenwashing.

3.3 Inclusion Criteria

The study encompassed employees who were actively working in companies where they had been exposed to workplace practices and ESG-related work in the form of sustainability reporting and initiatives. It was only applicable to Indian organizations to provide its contextual relevance in the Indian ESG regulatory landscape. The participants came from diverse sectors such as manufacturing, IT, banking and finance, healthcare, energy, and consumer goods, with experience ranging from less than 5 years to over 15 years. Employees aged 20 years and older who gave their voluntary consent to participate were included, and participation was conducted in an ethical manner.

3.4 Exclusion Criteria

Students and unemployed or retired persons were not included because they do not have direct experience of ESG practices. Employees from non-ESG reporting organizations were also excluded as they had no relevance. Data were screened for data quality by removing incomplete, inconsistent or duplicate responses to the questionnaires. Also, those who didn't know about their organization's activities within the ESG were excluded so that they can give informed and meaningful responses.

Table 1: Demographic Profile of Respondents (N = 181)

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	101	55.80
	Female	77	42.54
	Prefer not to say	3	1.66
Age Group	20–29 years	52	28.73
	30–39 years	66	36.46
	40–49 years	47	25.97
	50 years and above	16	8.84

Education Level	Bachelor's Degree	55	30.39
	Master's Degree	61	33.70
	M.Phil.	21	11.60
	Ph.D.	25	13.81
	Other	19	10.50
Industry Sector	IT/Technology	86	47.51
	Banking & Finance	53	29.28
	Manufacturing	13	7.18
	Energy	9	4.97
	Healthcare	8	4.42
	Consumer Goods	6	3.31
	Other	6	3.31
Work Experience	Less than 5 years	29	16.02
	5–10 years	68	37.57
	11–15 years	33	18.23
	More than 15 years	51	28.18

Table 1 shows that the 181 respondents were diverse in gender, age, education, industry, and work experience. Most participants were young, well-educated professionals from the IT/Technology and Banking & Finance sectors with 5–10 years of experience, indicating a good understanding of ESG disclosures and related organizational outcomes.

3.5 Sampling Technique

The sampling method used in this study is a stratified random sampling method in order to get the representation of work employees based on various industry sectors. First, the population was segmented into industry-specific strata, such as manufacturing, information technology, banking and finance, healthcare, energy, and consumer goods. From every stratum, participants were then randomly selected, so that each stratum had an equal chance of being a part of this study. This sampling approach was selected because ESG reporting practices, sustainability initiatives and the level of regulatory compliance may differ markedly by industry. So stratification helps to better capture these sectoral differences, to improve the representativeness of the sample, and to increase the overall validity and generalizability of research findings.

3.6 Sample Size Determination

The sample size for this study is 181 valid respondents. This sample size is sufficient for the purpose of the study because it utilizes advanced multivariate statistical analyses such as CFA, SEM, mediation analysis, and moderation analysis. A sufficient sample size is a critical criterion in SEM-based research for obtaining stable estimates of the parameters and for reliable model fit. The sample size ($N = 181$) is sufficient for conducting SEM and related analysis, as the study consists of 25 measurement items from different latent constructs. Hence, the responses collected are adequate in statistical power to assess the measurement model, test hypothesized relationships and make meaningful conclusions from the structural model.

3.7 Data Collection Method

This study employed a data collection method comprising both primary and secondary data to analyze the practices of ESG disclosures, the extent of regulatory guidance, and employee perceptions of greenwashing in Indian organizations.

Primary data:

Primary data were obtained by direct observation using a structured questionnaire from the employees of ESG-reporting organizations of the Indian context. The respondents were carefully chosen to meet the specified inclusion criteria, guaranteeing exposure to organizational ESG practices and sustainability efforts. To capture a wide range of viewpoints on ESG authenticity

and organizational action, the questionnaire was sent to workers across various industries, such as manufacturing, IT/technology, banking and finance, healthcare, energy, and consumer goods. The collected responses were then screened for completeness, consistency, and validity of data, and then used for statistical analysis.

Secondary data:

The secondary data was gathered from various resources available, such as ESG report, sustainability report, Business Responsibility and Sustainability Reports (BRSR), annual report, SEBI publications, and academic studies. The sources were used to gain an understanding of the Indian ESG reporting environment, to help develop the conceptual framework, to identify research variables, and to give background to the study. This hybrid approach allowed a thorough assessment of the quality, transparency, effectiveness of regulations, and the relationship between the perception of greenwashing and employee related outcomes in relation to ESG disclosure.

3.8 Questionnaire Structure

The questionnaires comprised of six sections. Section A collected information about the demographics of the respondents, including gender, age, education, industry sector, and years of experience. The ESG Disclosure Quality, ESG Transparency and Regulatory Oversight indicators were measured in sections B to D with focus on clarity, accuracy, openness, accountability, reporting standards and regulatory effectiveness. In Section E, Perceived Greenwashing was evaluated based on exaggerated claims, misleading communication, and hidden negative impacts. Section F assessed Employee Trust and Employer Attractiveness, which included confidence in ESG practices; communication and action alignment; preference for the workplace; and intention to recommend. The items were designed in the context of the study goals, conceptual framework, and existing ESG literature.

3.9 Measurement Scale

Respondents' perceptions about ESG disclosure practices, transparency, oversight, greenwashing and outcomes of the organization were measured on a 5-point Likert scale. The scale was a 5-point one ranging from 1 = Strongly Disagree to 5 = Strongly Agree, enabling the subjective voice of the employees to be quantified. The collected responses were analyzed by reliability test, validity test, CFA and SEM for testing the relationship between the research constructs.

3.10 Operationalization of Variables

The study operationalizes nine constructs to examine the relationships among ESG practices, perceived greenwashing, and organizational outcomes. ESG Disclosure Quality, ESG Transparency, Regulatory Oversight, and ESG Assurance are treated as independent variables, Perceived Greenwashing serves as the mediating variable, Employee Trust, Employer Attractiveness, and Organizational Reputation are considered dependent variables, while Regulatory Compliance functions as the moderating variable. Each construct is measured using multiple indicators that capture its underlying dimensions and is assessed on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). This operationalization provides a structured basis for validating the measurement model and examining the proposed relationships through CFA, SEM, mediation, and moderation analyses.

3.11 Pilot Study

A pilot study was carried out with 30 members prior to the survey to evaluate the clarity, reliability and appropriateness of the survey questionnaire. It assisted in defining the problems with the use of ESG terms, term understanding, and response patterns. Pilot participants provided feedback to test the structure and wording of the questionnaire and make necessary adjustments to ensure the final form is reliable and suitable for measuring the ESG disclosure quality, transparency, regulation oversight, greenwashing and employee-related outcomes.

3.12 Data analysis:

Data collected were analyzed statistically for reliability, validity, and relations between the research constructs. Data screening was done to find missing data and inconsistencies, then reliability analysis was carried out by Cronbach's Alpha and Composite Reliability (CR). The validity was calculated by using the factor loading, AVE, Fornell–Larcker criterion, and HTMT ratio. To explore response patterns and relationships between variables descriptive statistics and correlation analysis was conducted. The predictive effects of ESG-related factors on perceived greenwashing and organizational outcomes were assessed through

multiple regression analysis. To confirm the proposed hypotheses and the measurement model, CFA and SEM were used. The role of perceived greenwashing was investigated through the mediation analysis and regulatory compliance through the moderation analysis. Both SPSS and AMOS/SmartPLS software were used to analyze the effect of ESG on the perceptions of employees and organizational results.

3.13 Ethical Considerations

The study was conducted in accordance with ethical standards to safeguard the rights, privacy and confidentiality of the participants. This was a self-selected study, with informed consent obtained and the purpose of the study explained. Information collected or shared by respondents was anonymous, not including personal identifiers. The data collected were used only for academic purposes and analyzed in an aggregated manner throughout the research, ensuring the privacy and ethical integrity of all the information collected.

4. RESULTS AND DATA ANALYSIS

4.1 Data Screening and Preliminary Analysis

The data screening and normality test results were obtained on 181 valid responses as shown in Table 2. The dataset showed no missing value, thus fulfilling data completeness. Overall, respondents had a positive view of the ESG practices, with higher scores for Employer Attractiveness (3.81), Organizational Reputation (3.76) and Employee Trust (3.72). There was also moderate to high agreement for constructs of ESG, with ESG Disclosure Quality (3.69), ESG Transparency (3.55), ESG Assurance (3.47), and Regulatory Oversight (3.41), and Perceived Greenwashing (2.74). Skewness and Kurtosis values ranged from -0.44 to 0.29 and 0.46 to 0.63 , respectively which indicated normal distribution for the data and qualified it for further statistical analysis.

Table 2: Data Screening and Normality Assessment

Variable	Missing Values	Mean	SD	Skewness	Kurtosis
ESG Disclosure Quality	0	3.69	0.58	-0.42	0.61
ESG Transparency	0	3.55	0.61	-0.31	0.48
Regulatory Oversight	0	3.41	0.63	-0.26	0.52
ESG Assurance	0	3.47	0.59	-0.35	0.55
Perceived Greenwashing	0	2.74	0.68	0.29	0.46
Employee Trust	0	3.72	0.56	-0.39	0.58
Employer Attractiveness	0	3.81	0.62	-0.44	0.63
Organizational Reputation	0	3.76	0.57	-0.37	0.51

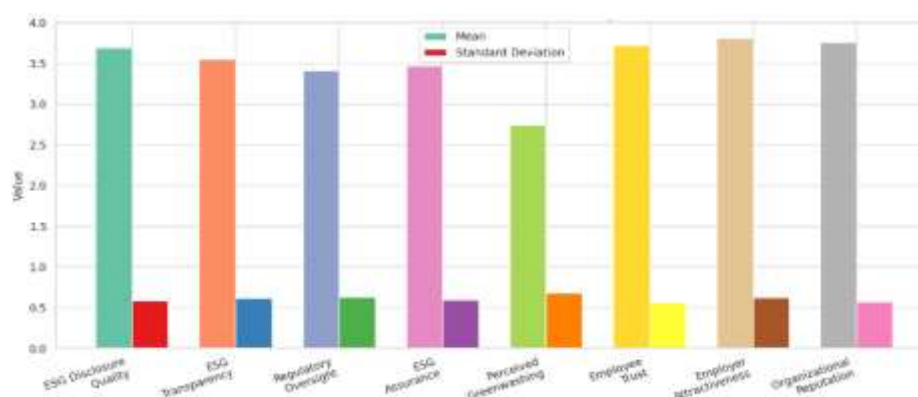


Figure 2: Mean and Standard Deviation of study variables

The results for the study variables are shown in the form of means and standard deviations in Figure 2. The results revealed that the mean scores of Employer Attractiveness (Mean = 3.81), Organizational Reputation (Mean = 3.76), and Employee Trust (Mean = 3.72) were the highest indicating positive perception of employees towards organizational ESG practices. The lowest mean value was found in Perceived Greenwashing with Mean = 2.74, indicating relatively low concerns about greenwashing. The range of the standard deviation values was between 0.56 and 0.68 which suggested a moderate level of variance in the respondents' perceptions.

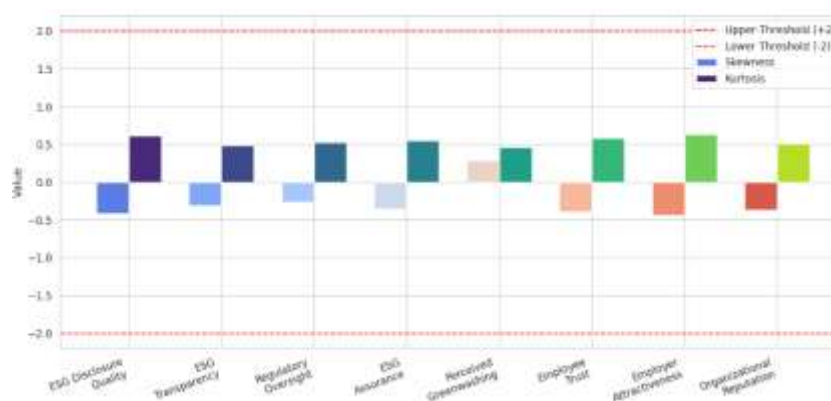


Figure 3: Normality Assessment using skewness and kurtosis

To check the normality of the data, the skewness and kurtosis values for all the study variables are shown in Figure 3. The skewness values ranged from -0.44 to 0.29 , while kurtosis values ranged from 0.46 to 0.63 . The range of all values is within the acceptable limit of ± 2 , which means that all data are normally distributed. Hence data can be used for further parametric analysis such as correlation, regression, CFA and SEM.

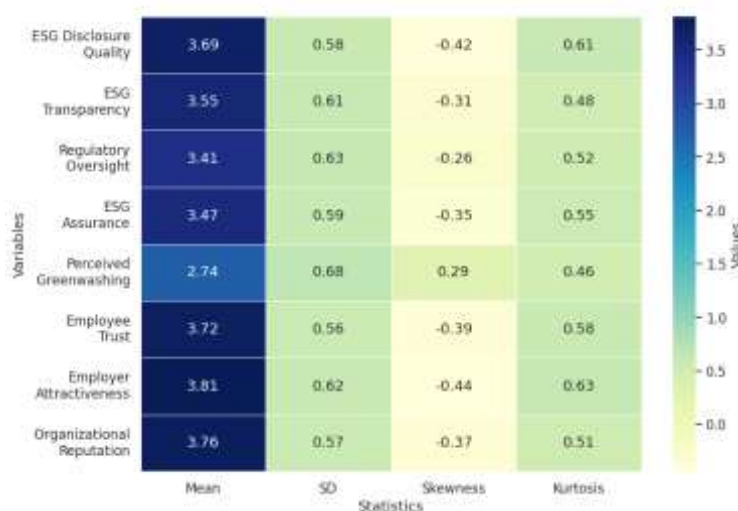


Figure 4: Heatmap of Data screening and Normality statistics

The mean, standard deviation, skewness and kurtosis values for all research variables are depicted graphically in a heatmap as in Figure 4. The heatmap distinctly shows higher mean scores at Employee Trust, Employer Attractiveness, and Organizational Reputation, while lower mean scores can be seen at Perceived Greenwashing. The even distribution of skewness and kurtosis for all variables further verifies that the data is normally distributed and validates the results of the statistical analyses to follow.

4.2 Reliability Analysis

The reliability analysis of the research constructs obtained by Cronbach's Alpha and CR is presented in table 3. The results show that all items have strong internal consistency with a score above 0.70. Cronbach's Alpha scores ranged from 0.791 to 0.852 with Composite Reliability scores from 0.842 to 0.891. In particular, Employer Attractiveness ($\alpha = 0.852$, CR = 0.891),

Employee Trust ($\alpha = 0.838$, CR = 0.879) and Organizational Reputation ($\alpha = 0.846$, CR = 0.884) exhibited high reliability levels, and all other constructs exhibited acceptable reliability levels. The results indicate that the items measuring the constructs are reliable and appropriate for further validity testing, CFA and SEM analysis.

Table 3: Reliability Assessment of Constructs

Construct	Items	Cronbach's Alpha	Composite Reliability	Reliability Status
ESG Disclosure Quality	5	0.842	0.884	High Reliability
ESG Transparency	5	0.816	0.861	Reliable
Regulatory Oversight	5	0.791	0.842	Reliable
ESG Assurance	5	0.824	0.872	Reliable
Perceived Greenwashing	5	0.806	0.851	Reliable
Employee Trust	5	0.838	0.879	High Reliability
Employer Attractiveness	5	0.852	0.891	High Reliability
Organizational Reputation	5	0.846	0.884	High Reliability
Regulatory Compliance	5	0.831	0.870	Reliable

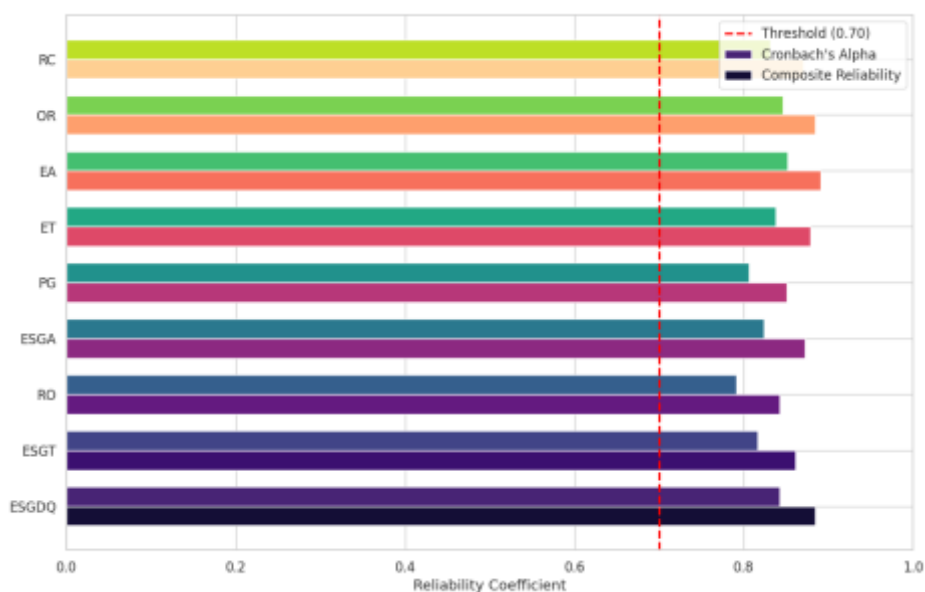


Figure 5: Comparison of Reliability Measures across constructs

The Cronbach's Alpha and CR of each study construct are shown in Figure 5. As can be seen from the results, the reliability coefficient of all items is above the recommended level of 0.70, with Cronbach's Alpha values ranging from 0.791 to 0.852 and Composite Reliability values ranging from 0.842 to 0.891. These results show the internal consistency and reliability of the measurement tools used in this study.

4.3 Convergent Validity Analysis

As shown in Table 4, the convergent validity analysis confirms that all constructs satisfy the recommended criteria, with factor loadings above 0.70 and AVE values ranging from 0.563 to 0.641. These results indicate satisfactory convergent validity and confirm that the measurement items adequately represent their respective constructs.

Table 4: Convergent Validity Assessment

Construct	Factor Loading Range	AVE	Result
ESG Disclosure Quality	0.71–0.86	0.612	Accepted
ESG Transparency	0.73–0.84	0.584	Accepted
Regulatory Oversight	0.70–0.82	0.563	Accepted
ESG Assurance	0.72–0.85	0.598	Accepted
Perceived Greenwashing	0.74–0.83	0.571	Accepted
Employee Trust	0.75–0.87	0.632	Accepted
Employer Attractiveness	0.73–0.88	0.641	Accepted
Organizational Reputation	0.74–0.86	0.626	Accepted

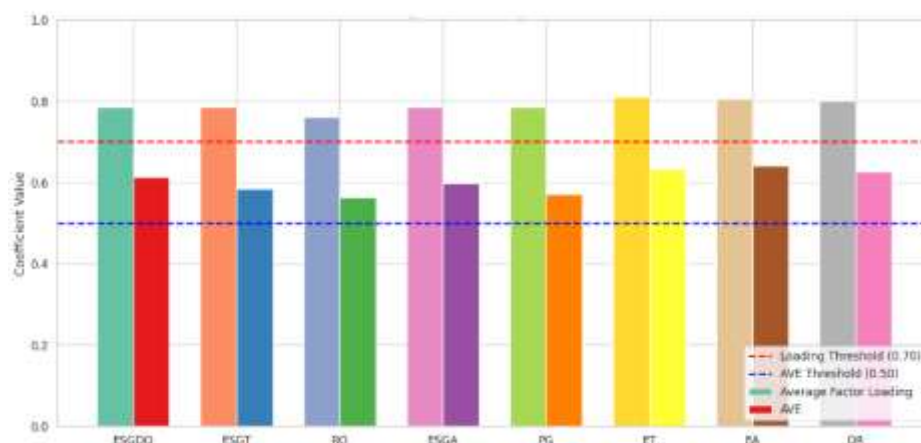


Figure 6: Convergent validity Assessment

The average factor loading values and the AVE values of the constructs are shown in figure 6. Besides, all the average factor loadings are higher than the recommended value of 0.70, and AVE values are greater than the minimum value of 0.50. The results of this confirm the convergent validity of the measurement, that is the extent to which the measurement items present the constructs that they measure.

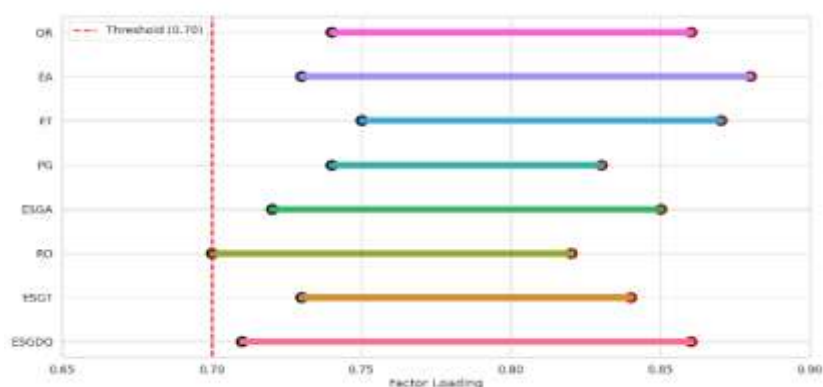


Figure 7: Factor loading Ranges across constructs

The minimum and maximum factor loading values for each construct are shown in figure 7. The factor loadings are between 0.70 and 0.88, which is within the recommended range of 0.70 or higher. This also shows that there is a strong association between the measurement items and constructs, which implies the validity of the measurement model for further analysis such as CFA and SEM.



Figure 8: Average variance extracted

All constructs in the study are shown with AVE values in Figure 8. AVE values are between 0.563 and 0.641, above the recommended value of 0.50. The highest value was obtained in Employer Attractiveness (AVE = 0.641) and Employee Trust (AVE = 0.632). The results show satisfactory convergent validity, where the constructs account for a large part of the variance of the items that measure them.

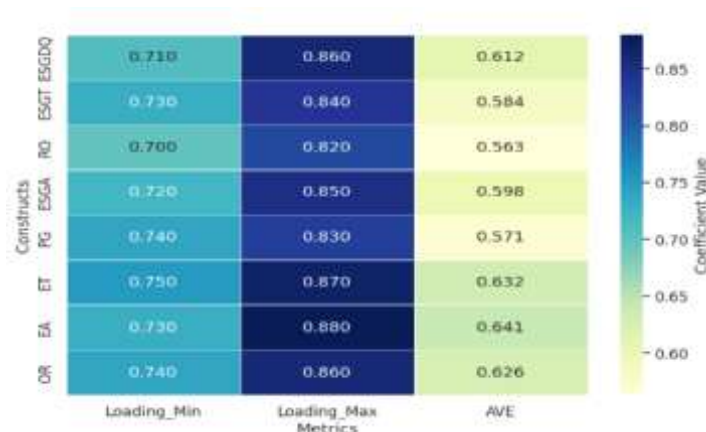


Figure 9: Heatmap of convergent validity statistics

The convergent validity indicators of minimum and maximum factor loadings and the AVE values are presented in a heatmap in Figure 9. As seen in the figure, all the factor loadings are greater than the recommended value of 0.70 and all AVE is well above 0.50. The strong relationship between the measurement items and the constructs is supported by the consistency of the patterns across the various constructs, thus indicating the satisfactory measurement model.

Table 5: HTMT Discriminant Validity Assessment

Construct Relationship	HTMT Value
ESGDQ – ESGT	0.72
ESGDQ – PG	0.61
ESGT – Employee Trust	0.68
RO – ESG Assurance	0.59
PG – Employee Trust	0.64
Employee Trust – Employer Attractiveness	0.71

Table 5 confirms discriminant validity, as all HTMT values were below the recommended threshold of 0.85 (ranging from 0.59 to 0.72). This indicates that all constructs are distinct and measure different theoretical concepts, making them suitable for further structural model analysis.

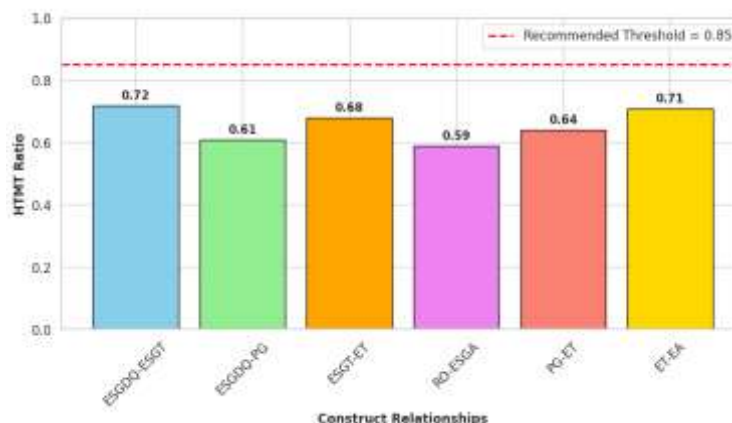


Figure 10: HTMT Discriminant Validity Assessment

Figure 10 illustrates the HTMT ratio values used to assess discriminant validity among the constructs. The range of all the values of HTMT is between 0.59 and 0.72 and are below the recommended value of 0.85. The highest HTMT value was observed between ESG Disclosure Quality and ESG Transparency (0.72), while the lowest was between Regulatory Oversight and ESG Assurance (0.59). The results support the separation of the constructs and confirm the constructs have satisfactory discriminant validity.

4.4 Descriptive Statistics

Figure 11 presents the mean and standard deviation values of the study variables. Mean scores were high for Employer Attractiveness (Mean = 3.81), Organizational Reputation (Mean = 3.76) and Employee Trust (Mean = 3.72), suggesting that an employee's perceptions of the employer's ESG practices are favorable. Perceived Greenwashing had the lowest mean score (Mean = 2.74), indicating that this was a relatively low concern in relation to the misleading sustainability claims. In summary, the findings indicate that higher ESG practices are linked to better employee outcomes.

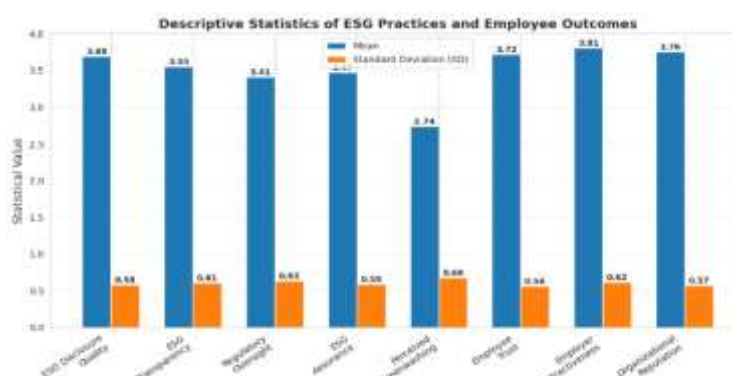


Figure 11: Descriptive statistics of ESG practices and Employee outcomes

4.5 Correlation Analysis

Table 6 shows the correlation results among ESG practices, perceived greenwashing, and employee outcomes. ESG Disclosure Quality is positively associated with ESG Transparency ($r = 0.64$), Employee Trust ($r = 0.56$) and Organizational Reputation ($r = 0.52$). Other positive correlations exist between ESG Transparency and Employee Trust ($r = 0.61$), Employer Attractiveness ($r = 0.55$), and Organizational Reputation ($r = 0.58$). However, Perceived Greenwashing is negatively associated

with Employee Trust ($r = -0.42$), Employer Attractiveness ($r = -0.39$), and Organizational Reputation ($r = -0.36$), thus implying that higher levels of greenwashing perceptions lead to lower positive employee outcomes.

Table 6: Correlation Matrix

Variables	ESGDQ	ESGT	RO	ESGA	PG	ET	EA	OR
ESGDQ	1							
ESGT	0.64**	1						
RO	0.42**	0.39**	1					
ESGA	0.51**	0.46**	0.48**	1				
PG	-0.38**	-0.34**	-0.29**	-0.31**	1			
ET	0.56**	0.61**	0.37**	0.48**	-0.42**	1		
EA	0.49**	0.55**	0.35**	0.44**	-0.39**	0.63**	1	
OR	0.52**	0.58**	0.41**	0.50**	-0.36**	0.59**	0.62**	1

$p < 0.01$

The correlation results indicate that ESG practices have positive relationships with employee outcomes, whereas perceived greenwashing negatively influences employee trust, attractiveness, and reputation.



Figure 12: Correlation matrix of ESG practices, Greenwashing and Employee outcomes

Figure 12 shows the correlation coefficients between the variables in the study. The constructs relating to ESG show positive strong relationships with Employee Trust, Employer Attractiveness and Organizational Reputation and negative relationships with Perceived Greenwashing. Employee Trust was the strongest of all the positive relationships with Employer Attractiveness ($r = 0.63$) indicating that trust plays a significant role in influencing employee perceptions.



Figure 13: Clustered correlation matrix

As shown in Figure 13, the clustered heat map indicates that ESG Disclosure Quality, ESG Transparency, Employee Trust, Employer Attractiveness, and Organizational Reputation are closely related and grouped together, while Perceived Greenwashing forms a separate cluster due to its negative association with the other constructs.

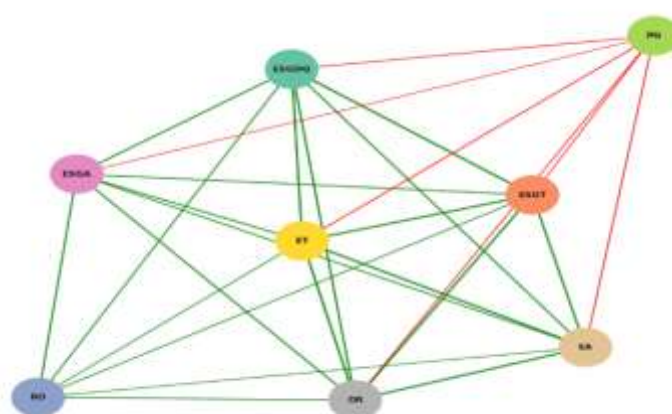


Figure 14: Network of correlations among Research variables

As shown in Figure 14, the correlation network illustrates positive relationships among ESG practices and employee outcomes, whereas Perceived Greenwashing exhibits negative relationships with most variables, indicating its adverse impact on employee trust, employer attractiveness, and organizational reputation.

4.6 Multiple Regression Analysis

The results of multiple regression analysis for the effect of ESG factors on perceived greenwashing from the viewpoint of investors are presented in Table 7. All ESG dimensions have significant negative effects, with ESG Disclosure Quality having the strongest impact ($\beta = -0.31$, $p < 0.001$), followed by ESG Transparency ($\beta = -0.24$, $p = 0.001$), ESG Assurance ($\beta = -0.21$, $p = 0.002$), and Regulatory Oversight ($\beta = -0.18$, $p = 0.017$). This model accounted for 46% of the variance in perceived greenwashing ($R^2 = 0.46$), showing that high ESG practices do have a significant impact on reducing greenwashing perceptions.

Table 7: Regression Analysis Predicting Perceived Greenwashing

Predictor	β	t-value	p-value
ESG Disclosure Quality	-0.31	-4.21	<0.001
ESG Transparency	-0.24	-3.52	0.001
Regulatory Oversight	-0.18	-2.41	0.017
ESG Assurance	-0.21	-3.08	0.002

$R^2 = 0.46$

The model accounts for 46% of the variance in the perceived greenwashing. Quality of ESG disclosure had the largest negative impact, suggesting that poor-quality reporting of ESG has the largest impact on perceptions of greenwashing.

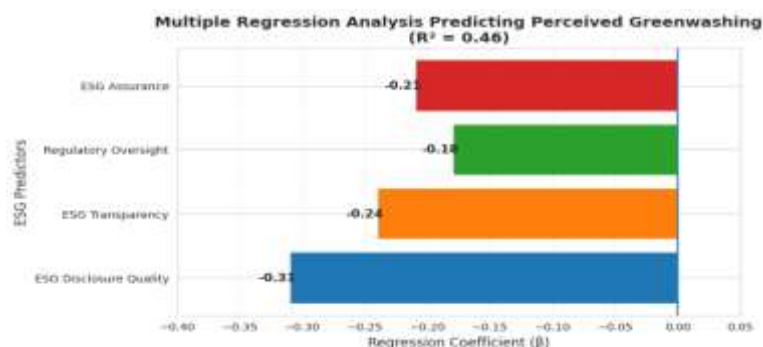


Figure 15: Multiple Regression Analysis

The multiple regression results are shown in Figure 15, which examine the influence of ESG-related factors on perceived greenwashing. ESD Quality of Disclosure had the biggest negative impact ($\beta = -0.31$), closely followed by ESG Transparency ($\beta = -0.24$), ESG Assurance ($\beta = -0.21$), and Regulatory Oversight ($\beta = -0.18$). The overall model accounted for 46% of the variance in perceived greenwashing ($R^2 = 0.46$), showing that the perceptions of greenwashing are significantly lower when ESG practices are stronger.

4.7 Confirmatory Factor Analysis

Table 8 presents the CFA results used to validate the measurement model and assess its overall fitness. The results show that the proposed measurement model is suitable to achieve an acceptable level of model fit. The ratio of chi square to degrees of freedom ($\chi^2/df = 2.18$) was less than the recommended 3 and this signified that the model was a good fit. The goodness of fit indices also met the recommended standards; GFI = 0.92, CFI = 0.94, and TLI = 0.92, which were above the acceptable level of 0.90. Moreover, the value of RMSEA was 0.064, which is lower than the recommended limit of 0.08, indicating an acceptable errors level. In general, the CFA results indicate that the measurement model was appropriate.

Table 8: Model Fit Indices

Fit Index	Value	Recommended	Interpretation
χ^2/df	2.18	<3	Good Fit
GFI	0.92	>0.90	Accepted
CFI	0.94	>0.90	Good Fit
TLI	0.92	>0.90	Accepted
RMSEA	0.064	<0.08	Good Fit

The CFA results confirmed that the measurement model achieved acceptable fit.

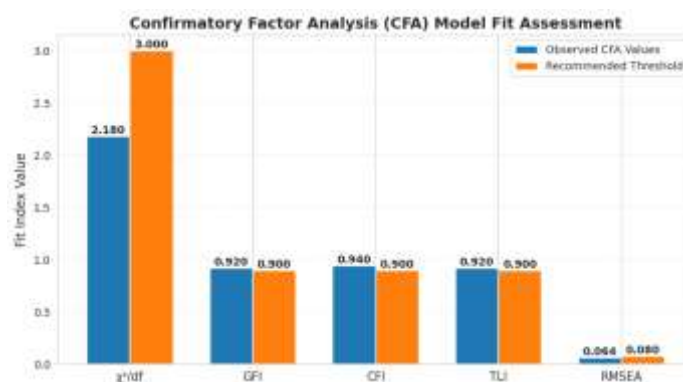


Figure 16: CFA model Fit Assessment

The CFA model fit indices are shown in Figure 16 and compared to the recommended thresholds. The results show acceptable model fit with $\chi^2/df = 2.18 (<3)$, GFI = 0.92, CFI = 0.94, TLI = 0.92 (>0.90), and RMSEA = 0.064 (<0.08). The results show that the measurement model reflects the research constructs well.

4.8 Structural Equation Modeling Results

The results for all hypothesized relationships are reported in Table 9 and were confirmed by the SEM. ESG Disclosure Quality has a significant negative relationship with Perceived Greenwashing ($\beta = -0.31, p < 0.001$), and a significant positive relationship with Employee Trust ($\beta = 0.42, p < 0.001$). Perceived Greenwashing ($\beta = -0.18, p = 0.017$) is also negatively impacted by Regulatory Oversight, while Organizational Reputation ($\beta = 0.36, p < 0.001$) is positively influenced by ESG Assurance. What's more, Employee Trust is found to have a strong positive association with Employer Attractiveness ($\beta = 0.49, p < 0.001$), further reinforcing the role of ESG practices in driving employee results.

Table 9: SEM Hypothesis Testing

Hypothesis	Path	β	p-value	Decision
H1	ESGDQ $\rightarrow$ PG	-0.31	<0.001	Supported
H2	ESGT $\rightarrow$ ET	0.42	<0.001	Supported
H3	RO $\rightarrow$ PG	-0.18	0.017	Supported
H4	ESGA $\rightarrow$ OR	0.36	<0.001	Supported
H5	ET $\rightarrow$ EA	0.49	<0.001	Supported

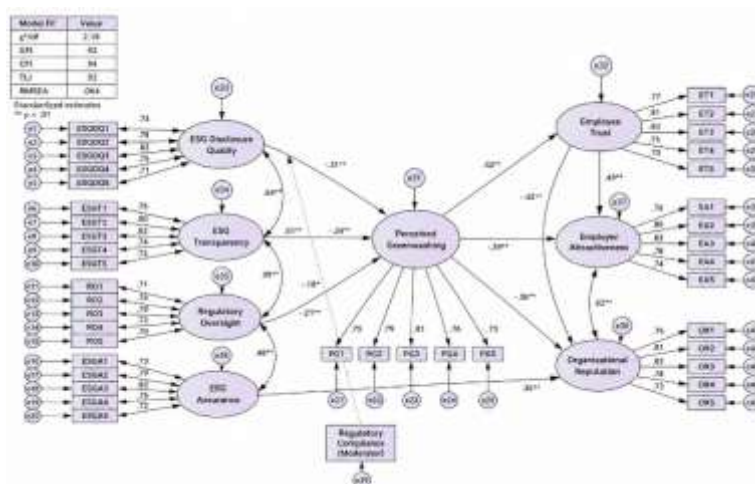


Figure 17: Structural Equation Model

Figure 17 depicts the SEM indicating the relationship between the ESG practices and the perceived greenwashing, employee trust, employer attractiveness, and organizational reputation. According to the model, ESG Disclosure Quality, ESG Transparency, Regulatory Oversight and ESG Assurance are important factors to shape perceived greenwashing and organizational outcomes. The standardized path coefficients indicate the magnitude and direction of the hypothesized relationships of the model.

4.9 Mediation Analysis

Table 10 reports the mediation analysis findings, indicating that perceived greenwashing partially mediates the relationship between the ESG practices and the employee outcomes. The indirect effect of the pathway ESG Disclosure Quality $\rightarrow$ Perceived Greenwashing $\rightarrow$ Employee Trust is significant at (0.13 $p = 0.002$), and the pathway of ESG Transparency $\rightarrow$ Perceived Greenwashing $\rightarrow$ Employer Attractiveness is significant at 0.11 ($p = 0.004$). The findings are consistent with those

from other studies indicating that perceived greenwashing is a critical factor in understanding how ESG practices drive employee attitudes and outcomes.

Table 10: Mediation Effect of Perceived Greenwashing

Relationship	Indirect Effect	p-value	Result
ESGDQ → PG → Employee Trust	0.13	0.002	Supported
ESGT → PG → Employer Attractiveness	0.11	0.004	Supported

4.10 Moderation Analysis

Table 11 presents the moderation analysis results showing that Regulatory Compliance significantly moderates the relationship between ESG Disclosure Quality and Perceived Greenwashing. The interaction effect is also statistically significant and negative ($\beta = -0.17$, $p = 0.006$), showing that ESG disclosure quality is more effective at lowering the perceived greenwashing level when the regulatory compliance level is high.

Table 11: Moderating Effect of Regulatory Compliance

Relationship	Interaction β	p-value	Result
ESGDQ × Regulatory Compliance → PG	-0.17	0.006	Supported

4.11 Hypothesis Summary

The results from the SEM hypothesis testing are summarized in figure 18. The hypotheses were all supported; the contribution of Employee Trust on Employer Attractiveness was positive and significant ($\beta = 0.49$); and the contribution of ESG Transparency on Employee Trust was positive and significant ($\beta = 0.42$). The mediation and moderation effects were also statistically supported and ESG Disclosure Quality ($\beta = -0.31$) and Regulatory Oversight ($\beta = -0.18$) showed significant negative relationships with perceived greenwashing, demonstrating the robustness of the proposed model.

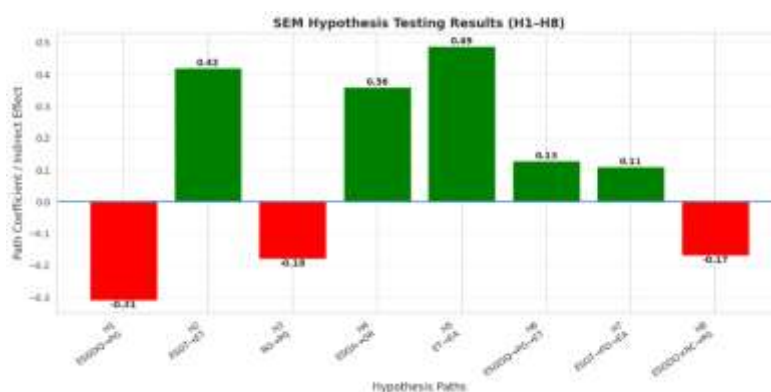


Figure 18: SEM Hypothesis Testing Results

4.12 Discussion: The study shows that employees assess ESG initiatives mainly based on the credibility and authenticity of organizational signals. Furthermore, ESG Disclosure Quality is significantly and negatively related to the perceived greenwashing ($\beta = -0.31$, $p < 0.001$), and ESG Transparency is significantly and positively related to employee trust ($\beta = 0.42$, $p < 0.001$), showing that transparent and open sustainability communication enhances organizational credibility. Additionally, perceived greenwashing is negatively related to Regulatory Oversight ($\beta = -0.18$, $p = 0.017$) and organization reputation is positively related to ESG Assurance ($\beta = 0.36$, $p < 0.001$), underscoring the need for monitoring and independent verification. The mediation results show that perceived greenwashing is a significant psychological link between ESG practices and employee outcomes, and that both the content and the authenticity of ESG information is relevant for employees. The theoretical underpinning is very strong and Cronbach Alpha values ($\alpha > 0.79$) and CR values ($\alpha > 0.84$) indicate that the items have good reliability. For model validities, the CFI value is 0.94 and the RMSEA value is 0.064, which are accepted values. Notwithstanding

the above, the study has limitations due to its cross-sectional design, self-reported nature of the data and the sector specific sample. In summary, the results indicate that greater ESG disclosure quality, transparency, assurance, and regulatory compliance can lead to higher levels of employee trust, employer attractiveness, and organizational reputation.

4.13 Implications of the Study

The study has important theoretical, practical, managerial, regulatory, and research implications. Theoretically, it extends Extended Signaling Theory by demonstrating that the credibility of ESG signals influences employee outcomes through perceived greenwashing, while regulatory compliance strengthens these relationships. Practically, organizations should prioritize accurate, transparent, evidence-based ESG disclosures and independent ESG assurance to enhance employee trust, employer attractiveness, and organizational reputation. From a human resource perspective, ESG should be integrated into employee engagement, internal communication, and retention strategies to foster trust and alignment with organizational sustainability goals. The findings also highlight the need for stronger regulatory oversight, standardized ESG reporting, and independent verification to reduce greenwashing and improve stakeholder confidence. Furthermore, organizations should adopt reliable, consistent, and accountable ESG reporting practices, while future research can extend this work through cross-country, sector-specific, and longitudinal studies, as well as by examining the role of artificial intelligence in improving ESG transparency and greenwashing detection.

4.14 Limitations of the Study

There are a number of limitations to this study. First, the cross-sectional design of the study precludes the ability to study changes in worker perceptions over time. Second, data reported in questionnaires is self-reported and hence may have been subjectively reported and may be defensively shielded against common method bias. Third, the sample consisted of those working in Indian ESG-reporting organizations, potentially limiting the generalizability of the findings to other countries and types of organizations. Fourth, the study examines selected ESG factors, and other potential factors like organizational culture, leadership commitment and employee ESG awareness are not addressed. Lastly, the quantitative approach can generate statistical relationships, and future research may use the qualitative or mixed-method approaches to gain deeper knowledge and insights into employee experiences and interpretations of ESG practices.

5. CONCLUSION

The study concludes that high-quality ESG disclosures, transparency, regulatory oversight, and ESG assurance strengthen the credibility of ESG practices, reduce perceived greenwashing, and enhance employee trust, employer attractiveness, and organizational reputation. The findings emphasize that aligning ESG claims with actual practices, evidence-based reporting, and independent assurance are essential for improving organizational legitimacy and employee confidence. For future research, longitudinal and cross-country studies, the inclusion of objective ESG data, examination of factors such as organizational culture and ethical leadership, and the application of AI and blockchain to improve ESG transparency and greenwashing detection are recommended.

DECLARATIONS

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Conflict of Interest

The authors of this manuscript declare no relationships with any companies, whose products or services may be related to the subject matter of the article.

Data Availability Statement:

Data sharing not applicable to this article as no datasets were generated or analyzed during the current study.

REFERENCES

- [1] Daga, S., Yadav, K., Singh, D., Pamucar, D., & Simic, V. 2025. Unveiling Greenwashing: Analyzing the interaction of factors discouraging ESG Greenwashing through TISM and MICMAC. *Journal of Environmental Management*, 380, 124850. <https://www.sciencedirect.com/science/article/pii/S0301479725008266>
- [2] Davidescu, A. A., Manta, E. M., Bîrlan, I., Mîler, A. M., & Niță, S. C. 2026. Detecting greenwashing in ESG disclosure: An NLP-based analysis of Central and Eastern European firms. *Sustainability*, 18(3), 1486. <https://www.mdpi.com/2071-1050/18/3/1486>.
- [3] De Silva Lokuwaduge, C. S., & De Silva, K. M. 2022. ESG risk disclosure and the risk of green washing. *Australasian Accounting, Business and Finance Journal*, 16(1). <https://www.uowoajournals.org/aabfj/article/id/952/>
- [4] Deng, P., Zhang, Y., & Yu, Q. 2024. Exploring investment optimization and “Greenwashing” from ESG disclosure: A dual examination of investor perception. *Journal of Economics, Finance and Accounting Studies*, 6(3), 08-22. <https://al-kindipublishers.org/index.php/jefas/article/view/7128>
- [5] Dhar, S., & Imran, M. 2026. Safeguarding environmental human rights by eradicating greenwashing through genuine corporate sustainability in India. *Frontiers in Sustainability*, 7, 1801063. <https://www.frontiersin.org/journals/sustainability/articles/10.3389/frsus.2026.1801063/full>
- [6] Feng, W., Siau, K. L., & Chen, H. Artificial Intelligence for Multimodal ESG Report Analysis: Detecting Corporate Greenwashing. Available at SSRN 6561557. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6561557
- [7] Florstedt, J., Fahlbusch, J., & Sontheimer, M. 2025. Detecting Greenwashing in ESG Reports: A Comparative Analysis of Machine Learning Methods in Traffic-Related Emissions Disclosure. In *Proceedings of the 10th edition of the Swiss Text Analytics Conference* (pp. 25-30). <https://aclanthology.org/2025.swisstext-1.3.pdf>
- [8] Gidage, M., Bhide, S., & Bilan, Y. 2025. Greenwashing in the Indian corporate landscape: an empirical assessment of ESG disclosures of NIFTY 50 companies. *Environment, Development and Sustainability*, 27(9), 21861-21885. <https://link.springer.com/article/10.1007/s10668-024-05191-3>
- [9] Hao, X., Tian, T., Dong, L., Wong, C. W., & Lai, K. H. 2026. Unmasking greenwashing in ESG disclosure: Insights from evolutionary game analysis. *Annals of Operations Research*, 356(1), 667-695. <https://link.springer.com/article/10.1007/s10479-025-06538-3>
- [10] Hu, P., Li, X., Li, N., Wang, Y., & Wang, D. D. 2024. Peeking into corporate greenwashing through the readability of ESG disclosures. *Sustainability*, 16(6), 2571. <https://www.mdpi.com/2071-1050/16/6/2571>
- [11] Kim, S., Shin, Y., Park, S., Joel, S., Kim, S. T., & Oh, J. H. 2023. Detecting greenwashing in sustainability disclosures: A prediction model for KOSPI 200 enterprises using ESG-BERT. In *2023 IEEE International Conference on Big Data (BigData)* (pp. 6198-6200). IEEE. <https://ieeexplore.ieee.org/abstract/document/10386798/>
- [12] Lestari, L., Al Sya'ban, M., Marliani, M., & Yusnaini, Y. 2026. Greenwashing in Sustainability Reports: Analysis of ESG Disclosure Quality in Multinational and Indonesian Companies. *Jurnal Akuntansi Keuangan Dan Perpajakan* | E-ISSN: 3063-8208, 2(3), 518-525. <http://jurnal.globalscients.com/index.php/jakp/article/view/1186>
- [13] Lipenkova, J., Lu, G., & Rao, S. X. 2023. Detecting greenwashing signals through a comparison of ESG reports and public media. <https://www.swisstext.org/wp-content/uploads/2023/09/Greenwashing.pdf>
- [14] Lokuwaduge, C. S., & De Silva, K. M. 2022. ESG risk disclosure and the risk of green washing. *Australasian Accounting, Business and Finance Journal*, 16(1), 146-159. <https://www.uowoajournals.org/aabfj/article/id/952/>
- [15] Ma, Y., Feng, G. F., Yin, Z. J., & Chang, C. P. 2025. ESG disclosures, green innovation, and greenwashing: All for sustainable development?. *Sustainable Development*, 33(2), 1797-1815. <https://onlinelibrary.wiley.com/doi/abs/10.1002/sd.3210>
- [16] Mihaylova, I., & Blumer, A. 2025. Approaches for detecting greenwashing in non-financial reporting: the auditor's perspective. *Journal of Financial Reporting and Accounting*. <https://www.emerald.com/jfra/article/doi/10.1108/JFRA-06-2024-0347/1269967>
- [17] Ong, K., Mao, R., Varshney, D., Cambria, E., & Mengaldo, G. 2025. Towards robust esg analysis against greenwashing risks: Aspect-action analysis with cross-category generalization. In *Proceedings of the 63rd Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)* (pp. 14854-14879). <https://aclanthology.org/2025.acl-long.723/>

- [18] Poiriazzi, E., Zournatzidou, G., Konteos, G., & Sariannidis, N. 2025. Analyzing the interconnection between environmental, social, and governance (ESG) criteria and corporate corruption: revealing the significant impact of greenwashing. *Administrative Sciences*, 15(3), 100. <https://www.mdpi.com/2076-3387/15/3/100>
- [19] Putnam, R., Lloyd, J., & Diaz, K. D. (2024). Detecting Greenwashing Through Forensic Auditing Techniques in ESG Reporting. https://www.researchgate.net/profile/YousifLuckmann/publication/404926336_Detecting_Greenwashing_Through_Forensic_Auditing_Techniques_in_ESG_Reporting_Author/links/6a07de8d2e263f2f0774837f/Detecting-Greenwashing-Through-Forensic-Auditing-Techniques-in-ESG-Reporting-Author.pdf
- [20] Sari, R. C., Sholihin, M., Cahaya, F. R., Ishola, A., Yuniarti, N., Pranesti, A., ... & Haryanto. 2025. Artificial Intelligence-Based ESG Greenwashing Detection: Road to Net Zero Carbon and Its Impact on Corporate Performance. *Business Strategy & Development*, 8(4), e70228. <https://onlinelibrary.wiley.com/doi/abs/10.1002/bsd2.70228>
- [21] Sklavos, G., Zournatzidou, G., Ragazou, K., & Sariannidis, N. 2025. Unmasking greenwashing in finance: A PROMETHEE II-based evaluation of ESG disclosure and green accounting alignment. *Risks*, 13(7), 134. <https://www.mdpi.com/2227-9091/13/7/134>
- [22] Sneideriene, A., & Legenzova, R. 2025. Greenwashing prevention in environmental, social, and governance (ESG) disclosures: A bibliometric analysis. *Research in International Business and Finance*, 74, 102720. <https://www.sciencedirect.com/science/article/pii/S0275531924005130>
- [23] Tian, L., & Niu, J. 2024. Mitigating Greenwashing in Listed Companies: A Comprehensive Study on Strengthening Integrity in ESG Disclosure and Governance. *Polish Journal of Environmental Studies*, 33(6). <https://www.pjoes.com/pdf-184634-111157?filename=111157.pdf>
- [24] Vihayes, V., Jug, R., Micheal, D., & James, M. 2025. Greenwashing in ESG Reporting: Risks, Detection, and Regulatory Responses. https://www.researchgate.net/profile/Violet-Vihayes/publication/404206287_Greenwashing_in_ESG_Reporting_Risks_Detection_and_Regulatory_Responses/links/69ee390932a2ba2b2d5599da/Greenwashing-in-ESG-Reporting-Risks-Detection-and-Regulatory-Responses.pdf
- [25] Wang, X., Chen, Y., & Yao, H. 2025. Revealing the veil of greenwashing in ESG reports: Predicting the degree of corporate greenwashing based on thematic and sentiment features of text. *IEEE Transactions on Sustainable Computing*. <https://ieeexplore.ieee.org/abstract/document/11106280/>
- [26] Wilson, B., Shallangwa, G. M., & Mela, S. L. 2026. Artificial Intelligence Models for Detecting Greenwashing in UK ESG and Green Finance Projects. https://www.researchgate.net/profile/Samson-Mela-3/publication/400225007_Artificial_Intelligence_Models_for_Detecting_Greenwashing_in_UK_ESG_and_Green_Finance_Projects/links/697bd53712f837212a160922/Artificial-Intelligence-Models-for-Detecting-Greenwashing-in-UK-ESG-and-Green-Finance-Projects.pdf