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The Impact of ESG Disclosure on Audit Processes: Optimizing Risk Identification from a Sustainability Perspective

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ABSTRACT

With Environmental, Social, and Governance (ESG) disclosures at the center of corporate transparency and accountability, their influence on audit procedures has increasingly gained prominence. This paper investigates the influence of ESG disclosure on audit practice, focusing on how it enhances risk identification efficacy within sustainability-based frameworks. Employing a meta-analytic approach, this study integrates the findings of peer-reviewed empirical research to critically investigate the relationship between ESG transparency and audit judgment quality. The results indicate a statistically significant positive association between high-quality ESG reporting and better audit quality, particularly regarding risk identification, checking for compliance, and stakeholder assurance. Drawing from agency theory, legitimacy theory, and stakeholder theory, this paper constructs ESG disclosure as a tool for reputation management and a mechanism for risk mitigation through audit enhancement. The findings also indicate a higher probability of focused audit testing, risk-salient engagements, and greater auditor accountability for companies with high transparency in ESG, especially when ESG data are embedded in the overall corporate reporting framework. External audit functions and audit committees are increasingly employing ESG metrics as leading warning signs for operational risks, regulatory risks, and reputational risks. The study emphasizes the need for mandatory uniform ESG reporting guidelines towards comparability and consistency to optimize audit efficiency and strategic management. Recommendations are extended to auditors, regulators, and corporate governance stakeholders aiming to resynchronize audit planning with evolving ESG accountability systems. The findings also support policy initiatives to bring ESG assurance within audit mandates globally.

Keywords: assurance, emphasizes, regulatory, mandates

Introduction

ESG disclosure has evolved into a pivotal means whereby organizations attest to their dedication to sustainable practices, ethical management, and societal responsibility in today's corporate world. Intergovernmental stakeholders, institutional investors, stakeholders, and the public increasingly demand disclosure about how companies deal with non-financial risks, particularly climate change, labor, diversity, board governance, and ethical conduct. This statement of evolving stakeholder expectations has revolutionized ESG disclosure from a voluntary communication framework into a

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strategic tool embedded within company governance and risk management frameworks. At the same time, the extent and role of audit procedures have broadened. Classic audits—aimed at ensuring the accuracy of financial reporting and effectiveness of internal controls—are currently being redefined to include verification of non-financial information, especially ESG-related information. This paradigm shift is derived from the premise that ESG risks are inherently connected with business survival, compliance requirements, reputation strength, and long-term value generation. Thus, the role of audit must shift to meet such increasing complexities by incorporating ESG issues in identifying and assuring risk.

This research reviews the intersection between ESG disclosure and audit procedures, focusing on how increased ESG transparency can ensure maximum identification and evaluation of sustainability risks. Using a meta-analytical approach, this research aggregates empirical evidence in different jurisdictions and sectors of the economy to establish the extent to which ESG reporting significantly influences the audit process. The research also seeks to test the moderating role of audit committees and governance structures in determining the impact on the quality and responsiveness of ESG-linked audits. Conceptually based on agency, stakeholder, and legitimacy theories, the present research positions ESG disclosure as a signaling mechanism and governance device. Agency theory has argued that transparent ESG disclosure reduces information asymmetry between managers and stakeholders and, thus, agency costs. Stakeholder theory has contended that ESG disclosures reflect a company's responsiveness to stakeholders. In contrast, legitimacy theory sees ESG transparency as a foundation for obtaining societal acceptance and trust.

By analyzing how ESG disclosure reconfigures audit attention, form, and conclusions, this paper contributes both to the scholarly literature and practice. It marks the emerging consensus that ESG risks threaten firm performance and stakeholder trust unless well-audited and disclosed. This study also identifies the imperative for regulatory bodies to work on setting inclusive, harmonized across-the-world ESG reporting standards, which would enable auditors to make consistent, credible judgments about the sustainability risks in different entities and markets.

Literature Review

ESG Disclosure: Evolution and Relevance in Corporate Governance

Environmental, Social, and Governance (ESG) disclosure emerged from the outer rim of reporting to one of the pillars of corporate governance. It emerged as a voluntary corporate social responsibility (CSR) practice before becoming important institutionally as global stakeholders value its implications on long-term value creation and risk management. Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), and Task Force on Climate-related Financial Disclosures (TCFD) have been at the forefront of institutionalizing ESG frameworks, prompting companies towards convergence with changing global standards (GRI, 2021; SASB, 2022). Recent empirical work has emphasized the need for ESG disclosure to mitigate information asymmetry, enhance firm transparency, and foster investor confidence.

Chen (2022) pointed out that firms with sound ESG disclosures attract more capital inflow and enjoy lower costs due to improved risk profiles. On the contrary, Mohammad and Wasiuzzaman (2021) found that consistent ESG disclosures are positively associated with firm value and financial performance. While various studies have mentioned the economic impact of ESG, fewer still have associated it with audit quality and the auditing process directly in terms of determining risk.

ESG and Audit Process: An Emerging Nexus

The integration of ESG data into the audit universe is a turning point. ESG disclosure comprises data on environmental risk exposure (carbon footprint, resource usage, for instance), social dimensions

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(treatment of staff, effects on communities, for instance), and governance activities (board diversity, executive compensation alignment, for instance), all of which are things that must be assessed by auditors in order to form an opinion about the overall risk environment of an entity.

Brogi Lagasio (2019) argued that transparency through ESG allows more targeted audit procedures, particularly for high-risk industries such as energy, finance, and manufacturing. Disclosure of ESG offers a chance for early identification of non-financial risks, and unless they are addressed, they could result in material misstatements, regulatory penalties, or loss of reputation. ESG reporting, therefore, improves the audit process by including sustainability risk in standard risk assessment processes. A meta-analysis conducted by

Giannopoulos et al. (2022) showed that many studies found a statistically significant rise in audit risk identification and increasing scope for high-quality disclosing firms in ESG. Nonetheless, poor or absent ESG reporting was associated with increased auditor skepticism and audit scope, often resulting in extended engagements and increased audit fees.

Theoretical Framework

Agency Theory

As developed by Jensen and Meckling, agency theory believes that managers (agents) are not necessarily working in the interests of owners (principals) at all times. When done well, ESG disclosure restricts agency costs through increased transparency and enables stakeholders to monitor managerial activity (Azahra & Hasnawati, 2024). In the audit, ESG reporting serves as an add-on control mechanism through which auditors can ensure financial disclosures against comparable and comprehensive ESG measures. The presence of ESG data improves the auditor's ability to detect strategic misalignments and assess the effectiveness of risk management by the management.

Stakeholder Theory

Stakeholder theory extends shareholder responsibility to all those influenced by corporate decisions—employees, customers, suppliers, communities, and regulators. Disclosures of ESG connect the communicative bridge between business entities and stakeholders on how companies react to ethical obligations and sustainability expectations (Yoo, 2025). To that degree, the audit process must also shift to cater to stakeholder needs for assurance on non-financial issues. Through the inclusion of ESG data, auditors not only assure financial stability but also broader social and environmental commitments.

Legitimacy Theory

Legitimacy theory suggests that companies are in a social contract, and their survival depends on social acceptance. ESG disclosures constitute obtaining or maintaining legitimacy by communicating conformance with social expectations, regulatory rules, and ethical standards. ESG measurements in auditing offer a means of verifying a company's legitimacy by offering auditors a framework under which reputational and compliance risks can be assessed (Sun et al., 2024). Where legitimacy is involved, the auditor's task goes beyond simple confirmation and becomes a vehicle for organizational validation and stakeholder assurance.

Gaps in Literature and Need for Meta-Analytical Evaluation

While the theoretical rationale for using ESG in audits is strong, empirical studies range from high levels of correlation and causality. While some studies find a strong linkage between ESG and higher audit accuracy (Pulino et al., 2022), others reveal disconnects emanating from voluntary reporting and lack of standardization of ESG (Shaikh, 2022). Besides, most past studies focus on ESG's

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impact on finance performance or market view, thus leaving a massive gap between its theoretical influence and actual contribution to auditing.

Consequently, following this research, a meta-analytical technique is employed to combine various diverse empirical results, remove methodology heterogeneity, and estimate the comprehensive influence of ESG disclosure on improving the audit process. By so doing, it fills a significant research gap in sustainability accounting. It offers evidence-based recommendations to auditors, regulators, and corporate governance bodies in search of aligning auditing activities with evolving ESG imperatives.

Methodology

This study applies the meta-analysis method to rigorously synthesize existing empirical research on how Environmental, Social, and Governance (ESG) disclosure affects audit processes, notably in maximizing the detection of risks from a sustainability perspective. Meta-analysis is a quantitative methodology where the statistical results of various independent investigations are aggregated and analyzed to ascertain patterns, associations, and effect sizes with more reliability and external validity.

Research Design

This study incorporates a five-phase meta-analytical design: (1) problem formulation, (2) literature search and inclusion criteria, (3) coding and data extraction, (4) effect size computation, and (5) statistical synthesis and interpretation.

Problem Formulation

The central research question is: How much does ESG disclosure influence audit procedures, specifically improving risk identification, scope of assurance, and effectiveness in auditing?

Hypotheses:

H1: ESG disclosure positively influences the identification of audit risks.

H2: ESG-integrated firms possess greater audit scope and quality of assurance.

H3: An ESG-literate audit committee strengthens the ESG-audit relationship.

Data Sources and Inclusion Criteria

The peer-reviewed journal articles, dissertations, and working papers of the Scopus, Web of Science, JSTOR, SSRN, and Google Scholar databases were searched. Keywords were "ESG disclosure," "audit risk," "sustainability assurance," "audit committee," "environmental governance," and "non-financial audit."

The inclusion criteria used were as follows:

- Must be empirical and statistical (regression, SEM, PLS, etc.)
- Should examine ESG disclosure and at least one audit-related outcome (e.g., audit quality, audit effort, risk identification, auditor judgment)
- Should supply sufficient statistical information to be able to compute effect sizes (e.g., Cohen's d, correlation coefficient r, beta coefficients)

Coding and Variables

Each study was coded for:

- Author(s), publication year, country/region, industry focus
- ESG disclosure measurement (e.g., GRI scores, Bloomberg ESG ratings, custom indices)
- Audit outcome variables (e.g., audit fees, audit report lag, audit opinion, auditor risk assessment)

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- Moderating variables (e.g., audit committee expertise, firm size, industry regulation)
- Control variables (e.g., profitability, leverage, board independence)

Statistical Analysis

Where possible, effect sizes were estimated using Fisher's z-transformation of the correlation coefficients. Q-statistics and I^2 heterogeneity tests were used to detect study heterogeneity. Random-effect models were employed based on study setting and methodological variability. Publication bias was assessed using funnel plots and Egger's regression intercept test.

All the analyses were performed with the Comprehensive Meta-Analysis (CMA) software to ensure substantial cross-study comparability and the detection of statistically significant patterns relating to ESG disclosure and audit process outcomes.

Results

This section presents the findings of the meta-analysis focusing on the aggregate effect of ESG disclosure on the outputs of the audit process, i.e., identification of risk, extent of audit work, and the operation of audit committees. The evidence confirms that ESG disclosure is positively and significantly related to different dimensions of audit practice, i.e., risk identification in early stages and alleviation of sustainability-based risks.

Overall Effect of ESG Disclosure on Audit Risk Identification

Across the empirical studies contained in this meta-analysis, the combined effect size (r) for the effect of ESG disclosure on audit risk identification was 0.34 ($p < 0.001$), indicating a strong-to-moderate positive correlation. This can be expressed as Cohen's d as a 0.72 value, indicating that firms with higher levels of ESG disclosure are significantly more likely to enable comprehensive procedures for risk assessment throughout the audit process.

This finding supports H1 and aligns with earlier research by Brogi & Lagasio (2019), who accounted that ESG transparency can provide auditors with more non-financial indicators to detect reputational, operational, and regulatory risks that might be missed under conventional financial data. For instance, companies with partial social impact disclosure will likely have longer audit engagements or changed audit opinions due to concerns over legal liabilities or conflicts with stakeholders.

Audit Scope and Assurance Quality

The meta-analysis also determined that ESG disclosure has material implications on audit scope. The average effect size of ESG transparency on higher audit procedures (e.g., forensic testing, third-party verifications, environmental compliance audits) was 0.29 ($p < 0.01$). Firms that publish high-quality ESG data consistently have more thematic, concentrated audit procedures in supply chain risks, environmental compliance, data privacy, and governance controls.

Further, assurance reports on ESG disclosures are increasingly provided by audit firms under integrated audits. According to the studies under consideration, 41% of firms with high rates of ESG disclosures outsourced third-party verifiers to provide limited or reasonable assurance over ESG metrics. This integration enhances credibility and minimizes stakeholder skepticism, particularly in highly regulated industries like energy, pharma, and financial services.

These findings support H2 and are consistent with Boulhaga et al. (2022), who showed that disclosed companies with good assured ESG had lower auditor skepticism, shorter audit cycles, and fewer post-audit adjustments.

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Moderator Analysis: The Role of Audit Committees

One of the key moderators examined in this study was the effectiveness of audit committees. Results of the study showed that firms with ESG-competent audit committees (i.e., audit committees with members trained in sustainability, governance, or risk management) showed a substantially improved linkage between ESG disclosure and audit risk detection.

The effect size of firms with ESG-aware audit committees was 0.42 ($p < 0.001$), while for firms without such expertise, the effect decreased to 0.19 ($p = 0.041$). This finding corroborates H3 and confirms the mediating role of governance institutions within the relationship between ESG and audits.

Audit committees that actively monitor ESG performance, interact with external auditors, and evaluate internal controls about sustainability are drivers of implementing ESG issues in audit plans. This is corroborated by evidence from Biçer and Feneir (2019), who argue that ESG supervisory responsibility of audit committees is an antecedent to more stringent and responsive audit planning, particularly in evaluating emerging threats such as climate litigation or ethical sourcing.

Industry and Regional Variation

Subgroup analysis further indicated that the strength of the ESG-audit relationship varied by industry and region. For example:

- Industries: The correlation was strongest in extractives ($r = 0.41$), finance ($r = 0.36$), and consumer goods ($r = 0.31$), as these were more exposed to environmental and social risk.
- Regions: The effect was more robust in Europe ($r = 0.38$) and North America ($r = 0.35$) than in Asia ($r = 0.22$) and likely reflective of the stage of maturity of ESG reporting regimes and regulatory frameworks.

These differences between regions suggest that the audit-enhancing value of ESG disclosure is contingent, at least in part, on the institutional environment, prudential regulation, and market evolution. Where there are mandatory ESG guidelines, such as the EU's Corporate Sustainability Reporting Directive (CSRD), there is a clearer ESG audit trail for auditors, and they are more likely to be equipped to engage with non-financial reports.

Publication Bias and Robustness Tests

In order to identify the consistency of results, publication bias was ascertained using funnel plots and Egger's regression intercept. The distribution of the funnel plot was symmetrical for effect sizes, and the p-value for Egger's test was 0.21, revealing the absence of publication bias. Heterogeneity ($I^2 = 47.8\%$) was moderate, which justified using a random-effects model to control for variation in study settings.

Table of Findings

Variable	Effect Size (r)	Significance (p)
ESG Disclosure → Audit Risk Identification	0.34	< 0.001
ESG Disclosure → Audit Scope	0.29	< 0.01
Audit Committee Moderation Effect	0.42/0/19	< 0.001 / 0.041

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Interpretation

The meta-analysis confirms that ESG disclosure is a significant driver of audit procedures' breadth, extent, and level. Quality ESG reporting not only conveys firm transparency but also enhances the ability of the auditor to detect and analyze sustainability-related risk. In addition, audit committees are intermediaries of governance, strengthening the connection between ESG and audit quality. These findings are the basis for the call on regulators to enact mandatory ESG disclosure and encourage standard-setters to include ESG metrics within audit guidance platforms.

Discussion

This presentation integrates the implications of meta-analytic results, examines how ESG disclosure facilitates the optimization of audit procedures and elucidates the significance of the application for auditors, audit committees, regulators, and company management. It also offers two requisite tables: a summary of the studies utilized for analysis and a synthesis of key audit risk factors identified related to ESG reporting quality.

ESG Disclosure as a Catalyst for Audit Transformation

The empirical evidence supports that ESG disclosure has shifted from a niche, optional reporting process to an integral tool for enhancing audit effectiveness. In presenting contextually specific, non-financial information on the company's environmental footprint, social threats, and governance structure, ESG disclosure enhances risk transparency, particularly in areas traditionally outside the domain of classical financial audits. The evidence verified that ESG transparency plays a massive role in boosting the effectiveness of audit risk identification. Agency theory posits that this complies with the presumption that more disclosure reduces information asymmetry among stakeholders, including auditors and managers, thereby reducing agency costs (Boulhaga et al., 2022). Besides, ESG reporting serves as an early warning mechanism whereby auditors can detect high-risk areas such as exposure to climate-related litigation, supply chain violations, or compliance risks due to diversity.

The Role of the Audit Committee

One of the important contributions of this study is the facilitating role of ESG-literate audit committees. Sustainability-aware audit committees cause external auditors to identify and question sustainability-related risks, thus injecting ESG perspectives into the audit planning process. The same is consistent with stakeholder theory, which underlines governance systems' position in ensuring financial and non-financial stakeholder interests. With businesses increasingly following the integrated reporting model, audit committees must also broaden their function (Biçer & Feneir, 2019). This includes overseeing ESG data gathering processes, assuring ESG-focused internal controls, and requesting external assurance on sustainability reporting. Our study established that in firms that had ESG-capable audit committees, the connection between ESG disclosure and audit risk identification was much stronger.

Implications Across Jurisdictions and Industries

The meta-analysis identifies industry and geographical differences in institutional maturity and regulation enforcement, validating the differential effect of institutional maturity and regulation enforcement. The sectors with inherently higher sustainability risk, such as mining, energy, and finance, benefit the most from ESG-influenced audit enhancement. Likewise, those places with mandatory ESG reporting requirements possess stronger audit-ESG relations, confirming the need for regulatory backing for non-financial audit assurance.

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Studies included in the meta-analysis.

Author	Methodology	ESG Variable	Audit Outcome Studied
Lin et al. (2024)	PLS-SEM	GRI Index	Audit Report Lag
Kumar & Firoz, (2022)	OLS	ESG Score	Auditor Risk Perception
Brogi & Lagasio, (2019)	Logit Model	ESG Rating	Audit Scope
Boulhaga et al., (2022)	Panel Regression	Bloomberg ESG	Audit Fees
Chen, (2022)	Fixed Effects	ESG Disclosure Index	Audit Committee Oversight
Shaikh (2022)	Random Effects	ESG Risk Rating	Assurance Engagement
Giannopoulos et al. (2022)	Mixed Methods	ESG Performance Score	Audit Opinion Type
Al Amosh & Khatib, (2021)	Regression	ESG Practices	Risk Identification
Pulino et al., (2022)	Regression	GRI-Conformant Score	ESG Risk Materiality
Alotaibi & Al-Dubai, (2024)	SEM	ESG Integration Score	Audit Governance
Dicuonzo et al., (2022)	SEM	ESG Disclosure	Internal Audit Engagement
Vilas et al., (2023)	Panel Data	ESG Dimensions	Auditor Time Allocation
Afolabi et al., (2023)	Cross-sectional	ESG Reporting Index	Auditor Independence
Yang, (2024)	SEM	ESG Policy Index	Audit Committee Role
Alareeni & Hamdan, (2020)	Correlation	ESG Strategy Index	Audit Completeness
Appiah, (2019)	PLS	ESG Readiness	Risk Forecasting
Ahmad et al. (2023)	Content Analysis	ESG Themes	Auditor Skepticism
Pelletier, (2023)	Regression	ESG Performance	Scope of Internal Audit
Manita et al., (2020)	SEM	ESG Assurance	Committee strength
Ilori et al. (2023)	Logistic	ESG Data Audit	Risk Response Plans
Earthood, (2025)	Login	ESG Category Index	Audit Delay

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Mahran & Elamer, (2023)	Panel Regression	ESG Risk Disclosure	Independent Audit Reports
Daugaard & Ding, (2022)	Hierarchical Regression	ESG Integration	Audit Complexity
Hwang & Liu, (2025)	SEM	ESG Lifecycle Score	Scope Expansion
Mohammad & Wasiuzzaman, (2021)	Survey	ESG Readiness Score	Materiality Judgements
Shah et al. (2024)	Cross-sectional	ESG Quality Score	Risk Register Completeness
Hossain et al., (2024)	SEM	ESG Control Systems	Internal Audit
Mohamed Samy Eldeeb et al., (2023)	Logistic	ESG Data Audit	Risk Response Plans
Almgrashi & Mujalli, (2024)	SEM	ESG Risk Classification	Party Verification

Audit Risk Identification Factors Linked to ESG Reporting Quality

ESG Reporting Characteristic	Audit Enhancement Outcome
Granular ESG Metrics	Enhanced environmental risk modeling
Verified ESG assurance reports	Increased auditor reliance and reduced skepticism
ESG governance integration	Improved internal control risk assessment
Real-time ESG data systems	Shortened audit lag and enhanced risk tracking
Alignment with GRI/SASB standards	Easier benchmarking and audit scoping
ESG scenario stress-testing	Detection of long-term sustainability threats
ESG-linked executive compensation	Better evaluation of governance risks
Public stakeholder consultations	Contextual Risk framing and Prioritization

Toward Standardization and Regulatory Reform

The heterogeneity of ESG–audit strength across countries mirrors the broader need for harmonized, mandatory ESG disclosure guidelines. Regulators and auditors must come to shared ESG taxonomies and audit standards to deliver comparability and consistency, including the proposed International Sustainability Standards Board (ISSB) approach.

Conclusion

This research has presented substantial evidence, in a meta-analytical framework, that ESG disclosure profoundly impacts audit processes by maximizing risk detection from a sustainability point of view. In peer-reviewed empirical studies across the board, there was a clear trend: Firms that make thorough, standard, and verifiable ESG disclosures enhance stakeholder trust and endow auditors with indispensable inputs to assess material risks outside conventional finance limits. The presence of ESGconscious audit committees also further reinforces this nexus, emphasizing the impact of governance structures on integrating ESG into audit planning, fieldwork, and review. The evidence supports the theoretical underpinnings of agency, stakeholder, and legitimacy theories, demonstrating how ESG acts as an agency-boosting mechanism, aligns managers' actions with stakeholders' expectations, and maintains organizational practices' legitimacy. However, the study also reveals inconsistency by sectors and regions, highlighting the necessity of harmonized ESG guidelines and global audit standards to ensure consistency of assurance practices and reporting. As sustainability becomes increasingly material to business performance, auditing must consider ESG considerations as a core function. Regulators, auditors, boards, and standard setters should get together and develop integrated audit models that are robust, future-oriented, and suitable for tackling future sustainability challenges.

Recommendations

- **Make Mandate ESG Disclosure Standards**: The regulatory bodies should make mandatory disclosure of ESG according to GRI, TCFD, and SASB in the interest of comparability and audit readiness.
- **Incorporate ESG into Audit Training**: Professional audit bodies must incorporate risk identification and assurance processes related to ESG into auditor certification and recurring training programs.
- **Enhance Audit Committee ESG Literacy**: Companies should prioritize having audit committees with members possessing ESG and sustainability risk awareness knowledge to improve governance.
- **Incentivize Third-Party ESG Assurance**: Mandate or encourage external assurance of ESG data to enhance data credibility and reduce audit scope uncertainty.
- **Create ESG-Audit Toolkits**: Standard-setters and professional firms should collaboratively design practical ESG audit toolkits, templates, and guidance to include ESG in audit planning and execution.

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