AUDIT QUALITY IN INDONESIA'S PLANTATION SECTOR: THE NEXUS OF ESG AND FIRM CHARACHTERISTICS

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ABSTRACT

This study examines the determinants of audit quality by integrating Environmental, Social, and Governance (ESG) performance and firm characteristics within a risk-based audit framework. It aims to assess whether ESG performance constitutes a meaningful risk signal in auditors decision-making relative to traditional financial and economic risk factors in a high-risk industry context.

The empirical analysis focuses on plantation companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period. Audit quality is proxied by audit fees and the likelihood of appointing Big Four auditors. ESG performance is measured using a composite ESG score constructed through content analysis of annual and sustainability reports. Panel data regression and logistic regression models are employed, incorporating robust standard errors as well as industry and year fixed effects to control for unobserved heterogeneity.

The results show that firm size is positively and significantly associated with both audit fees and the probability of engaging Big Four auditors, while leverage exhibits a negative and significant relationship with both audit quality proxies. In contrast, ESG performance, operational complexity, and profitability do not demonstrate statistically significant effects on audit quality.

This study introduces a hierarchical risk perspective by demonstrating that financially binding risk factors dominate audit outcomes, while ESG performance currently functions as a weak contextual signal in audit pricing and auditor selection decisions in a high ESG-exposure industry in an emerging market.

The study is limited to a single industry focusing on firms operating in the plantation sector and covers a relatively short observation period from 2022 to 2024. Future research should examine additional industries, extend the observation window, and explore measures of ESG credibility, including third-party assurance.

Keywords: Audit Quality, ESG Performance, Audit Fees, Big Four Auditors, Risk-based Auditing.

1. Introduction

Audit quality occupies a central position in accounting research due to its fundamental role in enhancing the credibility of financial reporting and protecting stakeholders from information risk. High-quality audits contribute to reducing agency conflicts, mitigating information asymmetry, and supporting efficient capital allocation by ensuring that financial statements faithfully represent the firm's underlying economic conditions (DeAngelo, 1981; Knechel et al., 2013). Consequently, a substantial body of research has sought to identify the determinants of audit quality, including factors related to both auditor characteristics and client firm attributes. Traditional audit literature typically emphasizes firm characteristics such as firm size, operational complexity, leverage, and profitability as key determinants of audit risk and the intensity of audit procedures performed by auditors (Simunic, 1980).

Prior audit research consistently identifies firm characteristics as primary determinants of audit quality. Factors such as firm size, operational complexity, leverage, and profitability influence the level of audit risk and the extent of audit effort required by auditors. Large firms with complex operations generally require greater audit effort due to higher inherent risk and control risk, while high leverage may increase auditors' exposure to litigation and

reputational risks (Simunic, 1980). These characteristics have long served as the foundation of audit fee determination models as well as auditor selection studies. However, evolving business environments and corporate reporting practices suggest that auditors' risk assessments are no longer limited to financial and operational dimensions alone, but increasingly incorporate various non-financial risks that have become more relevant in modern business practices.

In recent years, growing attention to corporate sustainability has stimulated the development of research on Environmental, Social, and Governance (ESG) practices. ESG information is increasingly viewed as an important source of information for investors and stakeholders in assessing firms' long-term risks. The expanding literature indicates that ESG performance has significant economic implications, including effects on firm value, cost of capital, and corporate risk (Christensen et al., 2021; Tsang et al., 2023). Data from the Global Reporting Initiative (GRI) show that investor interest in environmental, social, and governance issues continues to increase alongside the growing willingness of firms to disclose ESG information in sustainability reports (Zahroh & Hersugondo, 2021). In Asia, several emerging economies including the Philippines, Indonesia, India, and Malaysia are among the countries with relatively high levels of ESG adoption, with approximately 10–15 percent of firms providing ESG-related disclosures (Makhdalena et al., 2023). These developments suggest that ESG practices are becoming an increasingly integral component of corporate reporting systems in emerging markets.

Firms with strong ESG-oriented corporate cultures are generally more likely to disclose information regarding their ESG activities. Such disclosures reflect firms' efforts to operate responsibly and communicate their performance to relevant stakeholders. Through initiatives related to environmental stewardship and social responsibility, firms can strengthen the social legitimacy required to sustain their business operations. One tangible form of corporate contribution to society involves fostering environmental awareness and responsibility. These efforts play an important role in building the social legitimacy necessary to maintain long-term business continuity.

By implementing Environmental, Social, and Governance (ESG) principles, firms can demonstrate accountability toward the environment and society, thereby gaining acceptance and trust from stakeholders. This legitimacy may enhance firm value, strengthen corporate reputation, and support long-term business sustainability.

In Indonesia, ESG implementation has also been strengthened through regulatory initiatives. The Financial Services Authority (Otoritas Jasa Keuangan – OJK) issued Regulation No. 51/POJK.03/2017 on Sustainable Finance Implementation, which requires financial institutions, listed companies, and public firms to prepare sustainability reports as part of responsible business practices. This regulation encourages firms to enhance transparency regarding environmental, social, and governance aspects as part of their corporate reporting systems. As regulatory attention toward sustainability practices increases, ESG disclosures serve not only as communication tools for investors but also as important indicators for assessing firms' risk profiles and accountability.

The development of ESG practices also has implications for auditing. As independent parties responsible for providing assurance on the fairness of financial statements, auditors

must consider various risks faced by firms, including non-financial risks associated with sustainability practices. Emerging audit literature suggests that ESG-related factors may influence auditors' risk assessments, audit fee determination, and auditor selection decisions (Bin-Feng et al., 2024; Zahid et al., 2021). Despite the growing body of ESG research, several important gaps remain in the literature. First, prior studies predominantly focus on the capital market consequences of ESG disclosure, such as firm value, cost of capital, and investment decisions, while the implications of ESG performance for the audit market remain relatively underexplored. Second, existing empirical evidence is largely concentrated in developed economies where regulatory enforcement and sustainability reporting standards are relatively mature. Consequently, limited evidence exists regarding how ESG information influences auditors' risk assessments in emerging market environments characterized by higher information asymmetry and weaker institutional enforcement. Third, previous studies typically employ broad cross industry samples, which may obscure the role of ESG in industries with particularly high environmental and social exposure. These gaps highlight the need for further investigation into the relationship between ESG performance and audit quality within high ESG risk industries in emerging market contexts.

Although ESG research has grown rapidly, most studies still concentrate on capital market consequences such as firm value, cost of capital, and corporate risk. Research specifically examining the relationship between ESG and audit quality remains relatively limited. Furthermore, most empirical evidence originates from developed economies, leaving the relationship between ESG performance and audit quality in emerging markets insufficiently understood. Some recent studies have begun exploring ESG and audit quality from alternative perspectives, such as auditors' involvement in sustainability assurance services. For example, Li et al., (2025) find that the involvement of the same audit firm in both financial statement audits and ESG assurance can improve audit quality through knowledge spillovers and increased reputational investment by auditors. However, most prior research focuses primarily on ESG assurance services rather than examining how firms' ESG performance itself influences auditors' risk assessments and audit quality.

Based on this literature mapping, several research gaps remain to be addressed. First, most ESG studies focus on capital market outcomes, while the implications of ESG for the audit market remain relatively understudied. Second, existing evidence largely originates from developed economies, leaving limited understanding of the ESG audit quality relationship within emerging market contexts. Third, previous research generally employs broad cross-industry samples, with relatively few studies specifically examining industries with high ESG exposure.

Within the risk-based auditing framework, auditors evaluate multiple sources of client risk simultaneously during the audit planning and execution process (Knechel et al., 2013). These risks do not exist independently but rather form a layered structure that influences auditors' perceptions of material misstatement risk and engagement risk. In this study, this structure is conceptualized as a hierarchical risk framework, which views firm risk as a combination of several interconnected layers. The first layer consists of financial risk, such as leverage and profitability, which reflect the firm's financial stability. The second layer involves operational risk, including operational complexity and the scale of business activities, which may increase the difficulty of the audit process. The third layer comprises

non-financial risk, including risks associated with Environmental, Social, and Governance (ESG) practices. Within this framework, audit quality is viewed as the outcome of auditors' simultaneous evaluation of these multiple risk layers.

The relevance of ESG as a determinant of audit quality may be particularly pronounced in emerging markets. Emerging markets are generally characterized by higher levels of information asymmetry, weaker regulatory enforcement, and greater variability in corporate governance practices compared to developed economies (Buallay, 2019). Under such conditions, auditors may rely more heavily on observable risk signals including non-financial information such as ESG performance when evaluating client risk.

Indonesia provides a unique institutional context for examining this relationship. As one of the world's largest producers of plantation commodities, Indonesia faces sustained international scrutiny regarding the sustainability impacts of its plantation industry. In response, listed plantation companies have increasingly expanded ESG disclosures, either voluntarily or in anticipation of evolving sustainability reporting regulations. At the same time, the Indonesian audit market exhibits substantial variation in audit fees and auditor reputation, providing a rich empirical setting to examine how ESG performance and firm characteristics jointly shape audit quality. This study focuses on plantation companies listed on the Indonesia Stock Exchange, representing an emerging market context in which sustainability exposure and audit risk intersect in meaningful ways.

Drawing on audit fee determination and auditor selection literature, this study conceptualizes audit quality as an outcome influenced by both ESG performance and traditional firm characteristics. Unlike prior approaches that treat firm size, complexity, leverage, and profitability merely as statistical control variables, this study positions these variables as independent determinants of audit quality alongside ESG performance. This perspective aligns with the risk-based auditing framework, which emphasizes that audit outcomes reflect auditors' holistic assessment of client risk rather than isolated factors.

This study focuses on plantation firms listed on the Indonesia Stock Exchange. The plantation industry represents a particularly relevant context due to its high exposure to ESG related risks, including deforestation, land-use change, carbon emissions, and social impacts on surrounding communities (Cardoni et al., 2019; Gray, 2008). In this context, ESG information becomes highly material for stakeholders and may influence auditors' perceptions of client risk.
Based on this framework, this study addresses two primary research questions: (1) whether ESG performance is associated with audit quality, proxied by audit fees and the likelihood of engaging Big Four auditors; and (2) how the explanatory power of ESG performance compares with traditional firm characteristics in explaining audit quality within the plantation sector. By addressing these questions, this study contributes to the audit literature by integrating ESG performance into established models of audit quality, extending ESG research beyond capital market outcomes to audit market responses, and introducing a hierarchical risk perspective for understanding the relationship between sustainability factors and audit quality in emerging market contexts. These contributions align with the objectives of Meditari Accountancy Research in enriching the understanding of accounting and auditing practices across diverse institutional environments.

Based on the theoretical arguments developed above, this study conceptualizes audit quality as the outcome of auditors' risk assessment across multiple layers of client risk. In this framework, traditional financial and operational risk factors represent primary determinants of audit effort, while ESG performance functions as a non-financial risk signal that may influence auditors' perception of client risk. The conceptual framework of the study is illustrated in Figure 1.

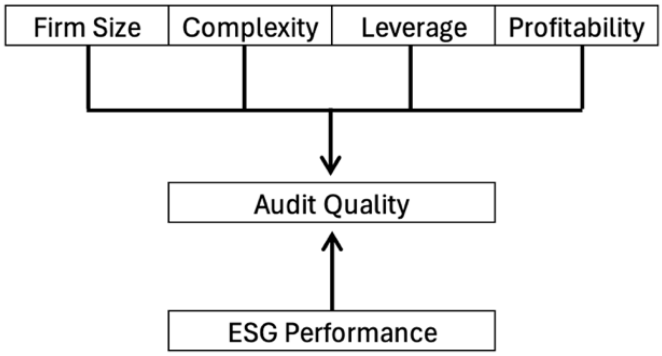

Figure 1.1 Conseptual Framework

This study contributes to the literature in several important ways. First, it extends the emerging literature on ESG by shifting the focus from capital market outcomes to audit market responses, thereby examining whether ESG performance is incorporated into auditors' risk assessments and pricing decisions. Second, this study provides new evidence from an emerging market context, where regulatory enforcement and sustainability reporting practices differ substantially from those in developed economies. Third, by focusing on the plantation industry, which is characterized by high environmental and social exposure, this study offers a unique setting to evaluate the relevance of ESG information in auditors' risk evaluation processes. Finally, this study introduces a hierarchical risk perspective that integrates financial, operational, and non-financial risk signals into a unified framework to explain variations in audit quality.

2. Literature Review

2.1. Risk-Based Audit Theory

Audit quality is conceptually defined as the probability that an auditor will both detect and report material misstatements in a client's financial statements (DeAngelo, 1981). This definition conceptualizes audit quality as the outcome of a combination of auditor competence, auditor independence, and the intensity of audit effort exerted during the audit process. Because audit quality cannot be directly observed, the auditing literature commonly employs proxies such as audit fees and auditor reputation to represent the level of audit effort and auditors' perceptions of client risk (Knechel et al., 2013; Simunic, 1980).

From the perspective of risk-based auditing, auditors design their audit strategies based on a systematic evaluation of multiple sources of risk that may influence the likelihood of material misstatements as well as the potential consequences of audit failure (Knechel et al., 2013). Analytically, this approach implies that auditors adjust audit

effort, allocate audit resources, and make engagement decisions according to the client's risk profile. An increase in client risk exposure raises the expected cost of audit failure, which includes potential litigation losses, regulatory sanctions, and reputational damage to auditors. To mitigate such risks, auditors may increase the intensity of audit procedures or charge higher audit fees as compensation for the higher engagement risk (Aobdia & Petacchi, 2022).

However, the consequences of audit failure are not determined solely by firm characteristics but also by the institutional environment in which the audit takes place. The corporate governance literature suggests that institutional enforcement, which includes the strength of regulatory enforcement, legal systems, and market monitoring mechanisms, shapes auditors' incentives to maintain audit quality (Christensen et al., 2021). In environments with strong regulatory enforcement, auditors face higher litigation risk and regulatory sanctions in the event of audit failure. Conversely, in systems with relatively weak enforcementsuch as those often observed in emerging markets auditors tend to rely more heavily on observable risk signals derived from firm characteristics when assessing client risk profiles.

Indonesia, as one of the emerging markets, has experienced continuous development in regulatory supervision and audit enforcement mechanisms in response to increasing demands for transparency and financial reporting accountability. Empirical studies in the Indonesian capital market context indicate that firm characteristics, audit structures, and external monitoring mechanisms play an important role in determining audit quality among firms listed on the Indonesia Stock Exchange (Falisah et al., 2025; Putri & Witono, 2025).

Recent studies further suggest that audit quality is significantly influenced by the interaction between client risk profiles and the institutional environment in which audits are conducted (Aobdia & Petacchi, 2022; Christensen et al., 2021). Within this context, audit quality can be understood as a market outcome reflecting auditors' responses to client risk within a specific institutional setting.

2.2. ESG Performance and Audit Quality

In recent years, Environmental, Social, and Governance (ESG) performance has increasingly been recognized as an important dimension in evaluating corporate risk. Recent literature indicates that ESG practices have significant economic implications through their effects on regulatory risk, reputational exposure, and the long-term sustainability of corporate operations (Christensen et al., 2021; Coelho et al., 2023; Krueger et al., 2024). Investors and stakeholders increasingly rely on ESG information as an indicator of firms' long-term risk exposure, thereby increasing firms' visibility to both the public and regulatory authorities (Velte, 2022).

From a risk-based auditing perspective, ESG performance can be interpreted as a non-financial risk signal that is relevant for auditors. Environmental incidents, social conflicts, or governance failures may trigger regulatory scrutiny, legal investigations, and stakeholder pressure. Such conditions increase auditors' reputational exposure in the event of audit failure (Murphy, 2013). Consequently, auditors may have incentives to exercise greater caution when auditing firms with high ESG visibility.

Nevertheless, the relationship between ESG performance and audit quality is not necessarily unidirectional. On the one hand, strong ESG performance may reflect stronger governance structures and more effective internal controls, potentially reducing audit risk. On the other hand, firms with extensive ESG disclosures often face greater scrutiny from regulators and the public, which may increase auditors' reputational risk if financial reporting failures occur (García-Sánchez et al., 2022; Habib et al., 2022).

Empirical evidence on the relationship between ESG and audit quality is still evolving. Several studies suggest that ESG performance influences audit fees because auditors adjust their level of audit effort according to the sustainability risk profile of the firm (García-Sánchez et al., 2022; Velte, 2022). Firms with higher ESG visibility are also more likely to engage auditors with stronger reputations to enhance the credibility of their reporting practices (Habib et al., 2022).

In emerging markets such as Indonesia, attention to sustainability practices and corporate governance has increased alongside the development of sustainable finance regulations and ESG disclosures by listed firms. Empirical studies within the Indonesian capital market context indicate that audit quality is influenced by various firm characteristics and audit-related mechanisms among companies listed on the Indonesia Stock Exchange (Falisah et al., 2025; Putri & Witono, 2025).

Based on the risk-based auditing perspective, increased ESG visibility may raise auditors' reputational exposure, thereby encouraging auditors to increase audit effort or motivating firms to engage auditors with stronger reputations.

- H1a : ESG performance is positively associated with audit fees.
- H1b : ESG performance is positively associated with the probability of engaging a Big Four auditor.

2.3. Firm Characteristics and Audit Quality

In addition to non-financial risk, the traditional auditing literature emphasizes that firm characteristics are important determinants of auditors' risk assessments. Factors such as firm size, operational complexity, leverage, and profitability reflect different dimensions of risk that may influence the intensity of audit procedures required by auditors (X. Li & Liu, 2024; Simunic, 1980).

Firm size is a primary indicator of operational complexity. Larger firms typically have higher transaction volumes, more complex organizational structures, and more sophisticated accounting systems. Such complexity increases the difficulty for auditors in obtaining sufficient and appropriate audit evidence, thereby requiring greater audit effort and higher audit fees (Christensen et al., 2021; Knechel et al., 2013).

Operational complexity also increases audit risk through the diversity of business activities and information systems used by firms. Auditors must allocate more resources to understand business processes and evaluate internal control systems in complex organizations (Knechel et al., 2013).

Leverage reflects the financial risk level of a firm. Highly leveraged firms face stronger pressure from creditors and a greater risk of financial distress, which increases the likelihood of financial misstatements and the litigation risk faced by auditors (Aobdia & Petacchi, 2022; Hope & Langli, 2010). Under such circumstances, auditors tend to exercise greater professional skepticism in the audit process to protect their professional reputation.

Profitability, however, has a more ambiguous relationship with audit quality. Higher profitability may signal financial stability, thereby reducing audit risk. At the same time, higher reported earnings may increase managerial incentives to engage in earnings management in order to maintain performance expectations (Christensen et al., 2021). Therefore, the relationship between profitability and audit quality remains largely empirical.

Several empirical studies within the Indonesian context also demonstrate that firm characteristics are important determinants of audit quality. For instance, research on manufacturing firms listed on the Indonesia Stock Exchange shows that firm size may enhance audit quality because larger firms tend to possess stronger internal control systems and face higher public scrutiny (Falisah et al., 2025). In addition, other studies suggest that auditor characteristics and audit firm structures also influence audit quality among Indonesian firms (Putri & Witono, 2025).

Based on the risk-based auditing perspective, firm characteristics that reflect higher operational and financial risk are expected to motivate auditors to increase audit effort.

- H2: Firm size is positively associated with audit quality.
- H3: Operational complexity is positively associated with audit quality.
- H4: Leverage is positively associated with audit quality
- H5: Profitability is associated with audit quality.

2.4. ESG, Audit Quality, and the Emerging Market Context

The relationship between corporate risk profiles and audit quality is expected to be particularly relevant in emerging market contexts. Emerging markets are generally characterized by higher levels of information asymmetry, relatively weaker regulatory enforcement, and greater variation in corporate governance practices compared to developed economies (Leuz & Wysocki, 2016). Dalam lingkungan seperti ini, auditor cenderung lebih sensitif terhadap sinyal risiko yang dapat diamati untuk melindungi diri dari potensi konsekuensi reputasi dan litigasi.

This condition is also relevant in Indonesia, where capital market regulations and audit oversight mechanisms have gradually strengthened in recent years. Empirical research on firms listed on the Indonesia Stock Exchange indicates that factors such as firm size, auditor structure, and external monitoring mechanisms play an important role in determining audit quality (Putri & Witono, 2025).

The plantation sector represents an industry with high ESG exposure and significant economic relevance. Plantation activities are closely associated with environmental and social issues such as deforestation, land-use change, carbon emissions, and conflicts with surrounding communities (Cardoni et al., 2019; Gray, 2008). These risks

increase regulatory attention and stakeholder scrutiny toward firms' sustainability practices. Within this context, ESG information not only serves as an indicator of corporate social responsibility but also functions as a relevant risk signal for auditors when evaluating client risk profiles.

3. Research Method

3.1. Reasearch Design and Identification Strategy

This study adopts a quantitative research design with a causal-explanatory orientation to examine how ESG performance and firm characteristics determine audit quality within a risk-based auditing framework. The empirical strategy is designed to identify systematic associations between observable client risk attributes and audit market outcomes, rather than to make structural or normative claims about sustainability effectiveness.

The identification logic of the study rests on the premise that audit quality proxied by audit fees and auditor choice reflects auditors' ex ante risk assessments and pricing decisions. Under risk-based auditing theory, these decisions are formed prior to audit execution and are based on auditors' evaluation of client characteristics that are observable, verifiable, and economically consequential (Knechel et al., 2013; Simunic, 1980). Accordingly, the empirical models are specified to capture cross-sectional and intertemporal variation in these characteristics while controlling for unobserved heterogeneity at the industry and year levels.

Rather than treating ESG performance as an exogenous normative attribute, this study conceptualizes ESG as a client-level risk signal that may or may not be internalized by auditors depending on its perceived reliability and enforceability. This framing is crucial for interpretation, as it allows for statistically insignificant ESG effects to be theoretically meaningful rather than anomalous.

3.2. Sample Selection and Data Structure

The population of this study consists of all plantation sector companies listed on the Indonesia Stock Exchange (IDX) during the observation period of 2022–2024. The sample was selected using a purposive sampling method. The research data were obtained from plantation companies over a three-year observation period. The plantation sector was selected because it is characterized by high environmental and social exposure, making ESG performance economically material and particularly relevant in the context of audit risk assessment.

The sample selection process followed several criteria:

- Firms are classified under the plantation sector and listed on the Indonesia Stock Exchange continuously during the period 2022–2024;
- Firms publish complete annual reports and audited financial statements;
- Data on audit fees and auditor identity are available; and
- Data on ESG performance and financial information required for measuring the research variables are available.

Based on these criteria, a screening process was conducted, resulting in 90 firm-year observations from 31 companies that satisfied all sample requirements. Firms with incomplete data for the main variables were excluded from the sample. Financial institutions were not included in the population due to their different regulatory characteristics and audit environments.

Table 3.1. Sample Selection

Sample Selection Criteria	Firm-Year Observations
Population: Total Plantation companies listed on the Indonesia Stock Exchange (IDX) during 2022–2024 (33 Companies)	99
Less: without audit fee information	(9)
Final sample used in the study	90

Source: author's calculation.

3.3. Data Sources and Data Collection Techniques

This study employs secondary data obtained from several sources. Data on audit fees, auditor identity, and financial statement information were manually collected from firms' annual reports and audited financial statements. ESG disclosure was measured using manual content analysis of annual reports and sustainability reports. The coding procedure followed a structured ESG disclosure checklist derived from established sustainability reporting frameworks used in prior literature. Each disclosure item was coded using a dichotomous scoring scheme, where a value of 1 indicates the presence of disclosure and 0 otherwise. To ensure coding reliability, the coding process was conducted independently by two trained coders. Inter-coder agreement was assessed using percentage agreement, and any discrepancies were resolved through discussion until consensus was reached. This procedure helps reduce subjectivity and improves the reliability of ESG measurement. This approach is consistent with prior auditing and sustainability research that combines financial and non-financial data sources to comprehensively measure client risk and audit engagement characteristics.

Table 3.2. Operational Definition and Measurement

Variable	Operational Definition	Measurement
Audit Fee	Total audit remuneration paid by the firm to its external auditor. Higher audit fees reflect greater audit effort and more extensive audit procedures (Azizkhani et al., 2023; Shen et al., 2024; Zhang et al., 2024)	Ln(Audit Fee)
Big Four Auditor	Proxy for auditor quality. Firms audited by Big Four audit firms are considered to have higher audit quality due to stronger expertise, resources, and reputation (Sofiana et al., 2023; Zhang et al., 2024)	Dummy = 1 if audited by Big Four (PwC, Deloitte, EY, KPMG), 0 otherwise

Variable	Operational Definition	Measurement
ESG Performance	ESG disclosure measured through content analysis of annual and sustainability reports based on the Refinitiv ESG framework (Choi & Rhee, 2023; Gidage & Bhide, 2025; Zahid et al., 2021)	$ESG\ Score = \frac{\vec{E} + \vec{S} + \vec{G}}{3}$ $\vec{E}$: Mean Scorre Environmental $\vec{S}$: Mean Score Social $\vec{G}$: Mean Score Governance
Firm Size	Firm size measured by the natural logarithm of total assets, representing firm scale and operational complexity (Rahman et al., 2024; Zhang et al., 2024)	Ln(Total Assets)
Complexity	Degree of operational complexity proxied by the proportion of accounts requiring intensive audit procedures (Chen & Su, 2026; Shaorou et al., 2023)	Complexity = $\frac{(Receiveable + Inventory)}{Total\ Asset}$
Leverage	Financial risk measured by the proportion of total liabilities relative to total assets (Doloksaribu et al., 2025; Sofiana et al., 2023)	Leverage = $\frac{Total\ Liability}{Total\ Asset}$
Profitability	Firm profitability measured by return on assets, representing the efficiency of asset utilization in generating profits ((Hikmah & Daljono, 2023; Zhang et al., 2024)	ROA = $\frac{Earning\ After\ Tax}{Total\ Asset}$

Source: author's calculation.

3.4. Econometric Models

To examine audit pricing, the following panel regression model is estimated:

$$Ln_{AuditFee_{it}} = \beta^0 + \beta^1 ESG_{it} + \beta^2 Size_{it} + \beta^3 Complexity_{it} + \beta^4 Leverage_{it} + \beta^5 ROA_{it} + FE_{industry} + FE_{year} + \varepsilon_{it}. \quad (1)$$

The model is estimated using Random Effects based on formal specification tests, with robust standard errors to account for heteroskedasticity and within-panel correlation.

To examine auditor selection, a logistic regression model is employed:

$$Pr\ (Big4_{it} = 1 = f(\ ESG_{it}, Size_{it}, Complexity_{it}, Leverage_{it}, ROA_{it}, FE_{industry}, FE_{year}) \quad (2)$$

This dual-model approach enhances identification by testing whether the same risk signals affect both audit pricing and auditor choice decisions.

3.5. Addressing Endogeneity Concerns

Several sources of potential endogeneity are considered and addressed within the study's design. Reverse causality may arise if audit quality influences ESG disclosure practices rather than the reverse. To mitigate this concern, ESG performance is treated as a contemporaneous risk signal rather than a post-audit outcome, and robustness checks using lagged ESG specifications are conducted. The persistence of results

under lagged specifications suggests that reverse causality does not drive the main findings.

Omitted variable bias is addressed through the inclusion of firm-level financial and operational characteristics that are well-established determinants of audit quality, as well as industry and year fixed effects that capture unobserved heterogeneity related to sectoral risk and macroeconomic conditions.

Measurement error in ESG scores is acknowledged as a limitation, particularly in emerging markets where ESG disclosure quality varies. However, from an identification perspective, such measurement error would bias estimated coefficients toward zero. Therefore, statistically insignificant ESG effects should be interpreted conservatively as evidence that ESG information is not strongly priced in audit markets, rather than as evidence of no underlying relationship.

Importantly, this study does not employ instrumental variable techniques or quasi-experimental designs, as no theoretically defensible and data-supported instruments for ESG performance are available in the study context. Instead, the identification strategy emphasizes transparency and theoretical coherence over overfitted econometric complexity, consistent with best practices in audit research.

3.6. Robustness and Model Validation

To ensure the stability of the estimated relationships, several robustness checks are performed. First, alternative audit quality proxies are used to confirm consistency across audit pricing and auditor selection outcomes. Second, robust regression techniques are applied to reduce the influence of outliers. Third, model specification tests are conducted to validate the choice of panel estimator.

Across these tests, the core findings namely the dominance of firm size and leverage and the limited role of ESG performance remain stable, supporting the internal validity of the empirical results.

3.7. Multicollinearity diagnostics

To ensure that the regression estimates are not affected by multicollinearity, diagnostic tests were conducted using the Variance Inflation Factor (VIF). Multicollinearity is considered problematic when VIF values exceed the commonly accepted threshold of 10. The results show that all independent variables have VIF values below this threshold, indicating that multicollinearity is not a concern in the empirical models.

4. Result and Discussion

4.1. Descriptive Statistics

The sample consists of plantation companies listed on the Indonesia Stock Exchange (IDX) during the period 2022–2024. After applying the sample selection criteria, the final dataset contains 90 firm-year observations.

Table 4.1. Descriptive Statistics (2022-2024)

Variable	Observations	Mean	Std. Dev	Min	Max
BIG4	90	0.466667	0.501683	0	1
ESG_SCORE	90	91.28022	12.44877	44.44000	100.0000
LN_AUDITFEE	90	20.66933	1.520731	17.96000	24.18000
COMPLEXITY	90	0.167444	0.167899	0.010000	0.630000
LEVERAGE	90	0.576111	0.410135	0.070000	2.640000
ROA	90	0.048889	0.069742	-0.180000	0.230000

Source: IDX Database, author's calculation.

The results show that approximately 46.7% of the sample firms engage Big Four auditors, indicating that auditor choice varies across plantation firms. This variation suggests differences in audit quality and audit market segmentation within the industry. The average ESG score is 91.28, with values ranging from 44.44 to 100, indicating substantial variation in ESG disclosure practices among firms.

The mean value of Ln_AuditFee is 20.67, which is consistent with the scale of natural logarithm transformation typically applied to audit fee data. This suggests that the reported audit fees fall within the expected range observed in prior audit research. Operational complexity, leverage, and profitability also exhibit sufficient variation across firms, suggesting heterogeneity in financial and operational risk profiles within the plantation sector.

Overall, the descriptive statistics confirm that the dataset contains adequate variation for empirical analysis and is appropriate for examining the determinants of audit quality.

4.2. Tests of Classical Assumptions

4.2.1. Normality Test

The normality of residuals was tested using the Jarque–Bera test. The test results show a probability value of 0.595136, which is greater than the significance level of 0.05. This indicates that the residuals are normally distributed and that the normality assumption of the regression model is satisfied.

4.2.2. Multicollinearity Test

Multicollinearity diagnostics were conducted using the Variance Inflation Factor (VIF). The results indicate that all independent variables have centered VIF values below 10, suggesting that multicollinearity is not present in the regression model (Gujarati & Porter, 2009). Therefore, the independent variables included in the model do not exhibit high correlations with each other and can be reliably used for further analysis.

Table 4.2 Multicollinearity Test

Variable	Centered VIF
LN_AUDITFEE	1.721
LN_ASSET (Firm Size)	1.659
LEVERAGE	1.392
ROA (Profitability)	1.147
ESG_SCORE	1.045
COMPLEXITY	1.157

Source: author's calculation Eviews12.

4.2.3. Heteroskedasticity Test

The heteroskedasticity test was conducted to examine whether the variance of residuals remains constant across observations. The test results indicate that the residual values fall within the acceptable range (+5 and -5), suggesting that the regression model does not exhibit heteroskedasticity. This implies that the assumption of homoskedasticity is satisfied.

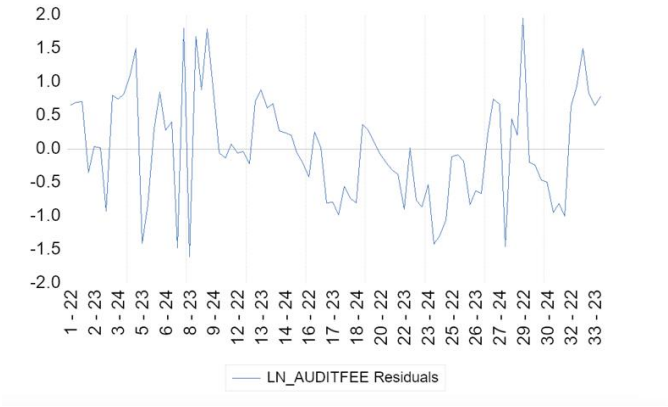

Figure 4.2

4.2.4. Autocorrelation Test

Autocorrelation was examined using the Durbin–Watson statistic. The estimated value of 2.302793 lies close to the benchmark value of 2, indicating that the regression model does not suffer from serious autocorrelation problems. Consequently, the residuals can be considered independent across observations.

Table 4.3. Autocorrelation Test

Weigthed Statistics			
R-squared	0.586487	Mean dependent var	9.823558
Adjusted R-squared	0.561873	S.D. dependent var	0.926655
S.E. of regression	0.581161	Sum squared resid	28.37082
F-statistic	23.82748	**Durbin-Watson stat**	**2.302793**
Prob(F-statistic)	0.000000		

Source: author's calculation Eviews12.

Based on these diagnostic tests, the regression model satisfies the classical assumptions and is therefore appropriate for hypothesis testing.

4.2.5. Panel Regression: Audit Fees

To examine the determinants of audit quality measured by audit fees, panel data regression analysis is employed. Based on the model specification tests, the random effects model is used for estimation.

Table 4.4. Result Random Effects Panel Regression

Independent Variable	Coefficient	Prob. (p-value)	Significance
ESG_SCORE	0.000423	0.9510	Not Significant
LN_ASSET (Firm Size)	0.872286	0.0000	Significant (+)
COMPLEXITY	-0.661180	0.3226	Not Significant
LEVERAGE	-0.817415	0.0035	Significant (−)
ROA (Profitability)	1.723934	0.2228	Not Significant
C (Intercept)	-4.316168	0.0919	–

Source: Author's calculation

The results show that firm size has a positive and statistically significant effect on audit fees. The coefficient of 0.872 indicates that a one-unit increase in the natural logarithm of total assets is associated with an approximately 87% increase in audit fees, holding other variables constant. This result suggests that firm size is not only statistically significant but also economically meaningful in explaining audit pricing decisions.

From the perspective of risk-based auditing theory, larger firms tend to have more complex operations, greater transaction volumes, and higher public visibility. These characteristics increase auditors' engagement risk and expected audit effort. As a result, auditors charge higher audit fees to compensate for the increased probability of audit failure and reputational exposure. This finding is consistent with prior studies documenting that firm size is one of the most robust determinants of audit fees (Knechel et al., 2013; Simunic, 1980).

Leverage is found to have a negative and statistically significant relationship with audit fees. The negative coefficient suggests that firms with higher debt levels tend to pay lower audit fees. This result appears inconsistent with classical audit theory, which predicts that higher leverage increases audit risk due to greater going-concern concerns and litigation exposure. However, this finding can be explained within the context of emerging market institutional environments, where financially constrained firms may negotiate lower audit fees or select less costly audit arrangements. Similar patterns have been documented in emerging market settings where client bargaining power and financial constraints influence audit pricing decisions (Buallay, 2019).

In contrast, ESG performance does not have a statistically significant effect on audit fees. The coefficient is positive but extremely small and insignificant.

This finding suggests that ESG performance does not currently function as a primary determinant of audit pricing decisions in the plantation sector.

Operational complexity and profitability are also not significantly associated with audit fees. These results indicate that traditional financial characteristics, particularly firm size and leverage, remain the dominant determinants of audit pricing decisions.

4.3. Robustness Analysis: Audit Fees

To assess the stability of the results, robust regression using M-estimation with Huber-type standard errors was conducted. The robustness results confirm the main findings: firm size remains positively and significantly associated with audit fees, while leverage continues to exhibit a negative and significant relationship. ESG performance, operational complexity, and profitability remain statistically insignificant.

These results suggest that the main conclusions are not driven by outliers or violations of classical regression assumptions and reinforce the robustness of the estimated relationships.

4.4. Logistic Regression: Big Four Auditor Choice

To further examine audit quality, logistic regression analysis is conducted to analyze the determinants of Big Four auditor engagement.

Table 4.5. Results of Logistic Regression Examining the Determinants of Big Four Auditor Engagement

Independent Variable	Coefficient	z-Statistic	p-value	Significance
ESG_SCORE	0.0250	0.6675	0.5045	Not significant
LN_ASSET (Firm Size)	1.0384	3.1307	0.0017	Positive and significan
COMPLEXITY	−1.3571	−0.6791	0.4971	Not significant
LEVERAGE	−4.2058	−2.3487	0.0188	Negative and significant
ROA (Profitability)	13.0976	1.8782	0.0603	Not significant
Constant	−31.2677	−3.4845	0.0005	—

Source: Author's calculation

The results show that firm size has a positive and statistically significant effect on the likelihood of engaging a Big Four auditor. This finding suggests that larger firms are more likely to appoint high-reputation auditors to enhance financial reporting credibility and meet stakeholder expectations. Larger firms face greater scrutiny from investors, regulators, and other stakeholders, increasing the benefits of engaging reputable auditors.

Leverage exhibits a negative and significant relationship with Big Four auditor choice. This result indicates that highly leveraged firms are less likely to engage Big Four auditors. One possible explanation is that firms with high debt levels face financial

constraints that limit their ability to afford higher audit fees associated with Big Four auditors.

Similar to the audit fee model, ESG performance does not significantly influence the likelihood of engaging a Big Four auditor. Operational complexity and profitability are also found to be statistically insignificant.

4.5. Hypothesis Testing

To provide a clear overview of the hypothesis testing results, a summary is presented.

Table 4.6 Summary of Hypothesis Testing Results

Hypothesis	Description	Audit Fee Model (Ln_AuditFee)	Big Four Model (Logit)	Conclusion
H1a	ESG performance is associated with audit fees	Not supported	–	Not supported
H1b	ESG performance is associated with the likelihood of engaging a Big Four auditor	–	Not supported	Not supported
H2	Firm size is positively associated with audit quality	Supported (+)	Supported (+)	Supported
H3	Operational complexity is positively associated with audit quality	Not supported	Not supported	Not supported
H4	Leverage is associated with audit quality	Supported (−)	Supported (−)	Supported (negative association)
H5	Profitability is associated with audit quality	Not supported	Not supported	Not supported

Source: author's calculation Eviews12.

Table 4 summarizes the hypothesis testing results. The findings show that hypotheses related to firm size and leverage are supported, while hypotheses related to ESG performance, operational complexity, and profitability are not supported. The consistency of results across audit fee and auditor choice models strengthens the robustness of the findings.

4.6. Discussion

The test results indicate that ESG performance (ESG_SCORE) does not have a significant effect on audit quality (p-value = 0.9510). This finding does not support the initial hypothesis stating that strong ESG performance will reduce audit risk and lead to higher audit quality or lower audit fees. Theoretically, this lack of significance can

be explained through several critical perspectives within the context of emerging markets.

Based on Signaling Theory, ESG information should function as a signal regarding the quality of corporate governance and risk management practices (Zahid et al., 2021). However, in emerging markets, ESG disclosure is often voluntary and fragmented, thereby reducing the consistency and reliability of such information for auditors (Zhang et al., 2024). Auditors tend not to treat ESG signals as risks that can be measured reliably in the audit pricing process if reporting standards have not yet been well established.

The phenomenon of greenwashing further obscures the credibility of corporate sustainability claims. ESG reporting practices that are more symbolic than substantive make it difficult for auditors to distinguish between genuine sustainability actions and marketing strategies (Azizkhani et al., 2023). This issue is exacerbated by the weak third-party verification of sustainability reports in emerging markets, causing ESG signals to lose their informational value in auditors' risk assessments (Shen et al., 2024).

From the perspective of Legitimacy Theory, companies may disclose ESG information primarily to obtain social legitimacy without making substantive improvements to their internal control systems. Because auditors focus on the risk of material misstatement in financial statements, ESG performance that is peripheral in nature may not have a direct impact on the audit effort required (Choi & Rhee, 2023). This finding is consistent with the argument that, in emerging markets, ESG data is often insufficient to serve as a reliable basis for adjusting audit effort or risk assessment (Gidage & Bhide, 2025).

In contrast to ESG performance, firm size (LN_ASSET) shows a positive and highly significant effect on audit quality (coefficient = 0.8722; p-value = 0.0000). This finding is highly consistent with the traditional audit literature and is supported by strong theoretical foundations.

Theoretically, this relationship can be explained through Agency Theory. Larger firms tend to experience more complex agency conflicts due to the greater separation between ownership and control. This situation increases the demand for high-quality audits to mitigate agency costs and provide assurance to dispersed shareholders (Shen et al., 2024). Large firms also have stronger reputational incentives to hire high-quality auditors (such as Big Four firms), which in turn charge higher audit fees to reflect their quality and reputation (Sofiana et al., 2023).

Moreover, from an operational perspective, large firms in the plantation sector typically have complex organizational structures, geographically dispersed operations, and a very high volume of transactions. These characteristics inherently increase audit risk and require greater audit effort, which is reflected in higher audit fees (Rahman et al., 2024). Auditors must allocate more human resources and time to perform testing procedures in large-scale entities, thereby increasing audit costs proportionally.

The most interesting and theoretically challenging finding is the negative and significant relationship between leverage and audit quality (coefficient = -0.8174; p-value = 0.0035). Conventionally, higher financial risk (high leverage) should increase audit risk and encourage auditors to increase audit effort, resulting in higher audit fees. However, the results of this study reveal the opposite pattern.

This phenomenon can be explained through the financial constraints theory in emerging markets. Firms with very high levels of debt often face significant liquidity pressure. Under such conditions, management tends to engage in aggressive cost-cutting strategies, including reducing budgets for external audit services (Sofiana et al., 2023). This situation may lead firms to choose lower-cost auditors or negotiate aggressively to reduce audit fees, potentially lowering overall audit quality.

Furthermore, the presence of alternative monitoring mechanisms may also explain this finding. In emerging markets, creditors (such as banks) often conduct direct monitoring through debt covenants or routine managerial reporting that does not fully rely on external audits (Sofiana et al., 2023). If creditor monitoring mechanisms are considered sufficient to supervise firm performance, the need for highly intensive independent audits may decline, thereby reducing audit fees even when leverage remains high.

Finally, financial pressure caused by high leverage may reduce the overall quality of financial reporting. However, if this condition is accompanied by a decline in auditors' bargaining power when dealing with financially distressed clients, audit fees may not reflect the true level of engagement risk (Visedsun et al., 2025). This finding highlights the complexity of the risk–return relationship in markets where legal protection for auditors varies.

The analysis of economic magnitude provides insight into the practical significance of each variable beyond statistical significance. By comparing the regression coefficients, firm size appears to have the most dominant economic impact on audit quality (0.872), followed by leverage (-0.817).

As an illustration, a one-unit increase in the natural logarithm of total assets increases audit fees by approximately 87 percent, ceteris paribus. This finding suggests that economies of scale and operational complexity are the primary determinants of the audit cost structure in the plantation sector. On the other hand, a one-unit increase in leverage also has a substantial impact (approximately 81 percent) but in the opposite direction. In contrast, ESG performance has almost no economic impact (0.0004), reinforcing the argument that non-financial metrics are still largely disregarded in determining the economic value of audit services in this sector.

These dynamics indicate that despite the global push toward ESG integration, the audit market in Indonesia's plantation sector remains dominated by traditional financial and operational risk considerations. The magnitude of the economic impact of firm size confirms that auditors continue to prioritize transaction volume and entity scale when allocating audit resources.

5. Conclusion

This study provides a comprehensive analysis of the determinants of audit quality in Indonesia's plantation sector by integrating ESG performance and fundamental firm characteristics within a risk-based auditing framework. The findings indicate that firm size is the most dominant and economically consistent determinant of audit quality, supporting Agency Theory. Larger firms require higher levels of assurance to mitigate complex agency costs, and operational scale remains the primary risk signal used by auditors in determining audit effort and pricing in emerging markets.

In contrast, leverage exhibits a significant negative relationship with audit quality, suggesting the presence of financial constraints. High debt pressure in plantation firms appears to function more as a liquidity constraint than as an audit risk driver, encouraging firms to reduce audit costs and weakening the demand for high-quality auditors. This finding highlights how economic constraints in emerging markets may override the theoretical risk premium that auditors are expected to impose.

The study also finds that ESG performance does not have significant explanatory power for audit quality, indicating a failure of the signaling mechanism of sustainability reporting in Indonesia. Although ESG is theoretically expected to reduce non-financial risk, the voluntary nature of disclosure, lack of standardization, and potential greenwashing limit its usefulness as a reliable risk indicator for auditors. Consequently, ESG disclosure currently functions more as a mechanism for social legitimacy rather than as an economically binding risk signal in the audit market.

Theoretically, this study contributes to the audit literature by introducing a hierarchical risk perspective, emphasizing that auditors' responses to client risk depend on both institutional conditions and firms' economic capacity. Practically, the findings highlight the importance for regulators (OJK) to strengthen ESG reporting standards and assurance mechanisms so that non-financial information can gain economic relevance in financial reporting ecosystems. For audit practitioners, the results underscore the need for greater vigilance when auditing highly leveraged clients to prevent audit quality deterioration driven by cost pressures.

Despite these contributions, this study has limitations related to ESG self-reporting bias and its focus on a single industry. Future research may extend this work by examining the moderating role of sustainability regulatory enforcement and by employing output-based audit quality proxies, such as financial statement restatements, to further understand audit quality dynamics in the sustainability era.

APPENDIX

The population of plantation companies listed on the IDX in 2022-2024 are 35 companies. Sample of 33 plantation companies which are used to be processed in this research:

No	Code	Company_Name
1	AALI	Astra Agro Lestari Tbk
2	ANDI	Andira Agro Tbk
3	ANJT	Austindo Nusantara Jaya Tbk
4	BISI	BISI International Tbk
5	BTEK	Bumi Teknokultura Unggul Tbk
6	CSRA	Cisadane Sawit Raya Tbk
7	CBUT	Citra Borneo Utama Tbk
8	DSNG	Dharma Satya Nusantara Tbk
9	BWPT	Eagle High Plantations Tbk
10	FAPA	Fap Agri Tbk
11	FISH	FKS Multi Agro Tbk
12	GZCO	Gozco Plantations Tbk
13	OILS	Indo Oils Perkasa Tbk
14	JAWA	Jaya Agra Wattie Tbk
15	JARR	Jhonlin Agro Raya Tbk
16	LSIP	PP London Sumatra Indonesia Tbk
17	MGRO	Mahkota Group Tbk
18	MKTR	Menthobi Karyatama Raya Tbk
19	NSSS	Nusantara Sawit Sejahtera Tbk
20	PNGO	Pinago Utama Tbk
21	PALM	Provident Agro Tbk
22	PGUN	Pradiksi Gunatama Tbk
23	PSGO	Palma Serasih Tbk
24	SGRO	Sampoerna Agro Tbk
25	SIMP	Salim Ivomas Pratama Tbk
26	SMAR	Smart Tbk
27	SSMS	Sawit Sumbermas Sarana Tbk
28	STAA	Sumber Tani Agung Resources Tbk
29	TAPG	Triputra Agro Persada Tbk
30	TBLA	Tunas Baru Lampung Tbk
31	TLDN	Teladan Prima Agro Tbk
32	UNSP	Bakrie Sumatera Plantations Tbk
33	WAPO	Wahana Pronatural Tbk

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